BUSINESS PROCESS RE-ENGINEERING IN UK UNIVERSITIES

by

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Jillian MacBryde, July 1998

ABSTRACT

The thesis starts by examining the environment surrounding UK universities and concludes that external pressures are forcing universities to change. Internal pressures, largely resulting from rapid growth and lack of business systems are also adding to the argument for change. Having concluded that UK universities do indeed need to become more: customer focused; flexible; and efficient - the thesis then puts forward the hypotheses that:

- Business Process Re-engineering (BPR) may provide UK universities with a methodology for change;
- but that the contextual differences between UK universities and business enterprises are so great that existing BPR methodologies couldn't be easily adopted by universities in the UK;
- yet, existing methodologies may be used as a basis for creating a methodology designed specifically for UK universities.

On reviewing existing BPR methodologies in light of the contextual differences between UK universities and business enterprises, it was concluded that existing methodologies were indeed inappropriate for the university context.

The remainder of the thesis documents work carried out in order to develop a more appropriate methodology for the UK university sector. Firstly the results of a quantitative survey aimed at establishing how many UK universities have tried to use Business Process Re-engineering are reported. Secondly the results of a more in-depth, qualitative, investigation are documented. The qualitative research took the form of in-depth interviews with personnel involved in "BPR" exercises in ten UK universities.

The drivers for change, the methodologies employed, the problems and the success factors are documented in this thesis. Having analysed the results of this research, a methodology for Business Process Re-engineering in UK universities is developed and documented. Based on feedback received from academics, practitioners and consultants alike, the thesis concludes that the methodology represents a contribution to current knowledge.

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CHAPTER 1

BACKGROUND & INTRODUCTION

This chapter details the context in which this thesis is based. Some of the background concepts will be introduced and the format of subsequent chapters will be outlined.

1.1 Background

The pressures facing business enterprises today are well documented, as are businesses' attempts to adapt themselves to deal with the ever changing environment. What is less well documented is the fact that universities share many of the environmental constraints that for-profit businesses face. Both are buffeted by increasing competition, global markets, changing customer demands, and financial constraints. The difference is, by and large, for-profit organisations have responded quicker than universities to the changes surrounding them.

In 1990 a seminal article "Re-engineering Work: Don't Automate, Obliterate" appeared in the Harvard Business Review and introduced the corporate world to the concept of Business Process Re-engineering (BPR). The author, Michael Hammer argued that American businesses were still organised along the lines of the principles laid down by Adam Smith in "The Wealth of Nations". Smith's premise, formulated during the industrial revolution, was that productivity could be maximised through the division of labour. Hierarchical organisational structures then evolved as the most

efficient form of control. Today many businesses are still organised in this way and we are left with a legacy of hierarchical management and specialisation of labour - thereby separating the workers from the customers, products and services - thus leading to pervasive inefficiency. Hammer argues that it is time to change: the current environment demands a fresh look at how we organise business. In this Information Age change occurs so quickly that hierarchical control systems cannot keep up. The artificial divisions of labour imposed by the management pyramid is a formula for failure, according to Hammer. With functional areas and top-down control structure, no individual is responsible for the complete process and customer focus is lost.

Today the most commonly found organisational structure is the pyramid, with layers of management in separate functional areas. Like for-profit organisations, the university has developed along the lines of specialisation and division of labour, evolving from its monastic origins into a form with similar layers of management and functional specialisation. The vast majority of UK universities are divided into Faculties or Schools and further into Departments - and the levels of management seen in the corporate sector are reflected in University, Faculty and Department levels of control. Thus whilst universities may be perceived as having flatter, decentralised structures - a closer look uncovers similar hierarchies. Each department's organisational chart is a mini-hierarchy, and these hierarchies, the webs of responsibilities and accountabilities, are duplicated in dozens of departments. Departments are then overseen by central hierarchies - not to mention the hierarchies involved in the multitude of functional areas such as Finance, Personnel and the like.

Management theorists (e.g. Senge 1990, Peters 1992, Handy 1994) are in agreement that hierarchical structures are ill suited to the needs of the twenty-first century. Business Process Re-engineering (BPR) has enabled

many corporations to break with these old structures and associated ways of working. Companies have re-engineered themselves and in doing so achieved large improvements in productivity and efficiency, reductions in cycle time, increased customer satisfaction and substantial cost savings.

To date re-engineering efforts have mainly focused on transforming business enterprises. The question that remains unanswered is, can the lessons learned in industry be applied to the UK university ?

1.2 Objectives

It would appear that no-one working within higher education in the UK today has been untouched by the rapidly changing environment surrounding them. This researcher is no exception. Engaged in research in the area of change management, total quality management and business process re-engineering, the author was drawn to study the issue of change in higher education from an institutional perspective. Thus the focus of the research is the application of business process re-engineering methodologies, tools and techniques, successfully used in industry, to the UK university sector. The researcher wishes, firstly, to discover if there is evidence of UK universities applying Business Process Re-engineering to their processes. She wishes to uncover the drivers for such radical change, the problems encountered and the success factors. Having answered these research questions, a further aim of the research is the development of a methodology for organisational change in universities, based on the principles of re-engineering. This methodology will provide a structured framework and a set of tested tools and techniques to facilitate organisational change within the UK university context.

Thus the author wishes first to convince universities for the need to change, and secondly to provide them with a methodology to guide them through the process.

1.3 Value and Contribution

Many commentators (e.g. Barnett 1990, Hague 1991, Ewing 1994) have documented the belief that universities need to change in order to adapt to a new working environment. What they haven't come up with to date is a prescription for that change. How can a university set out on the road to change? Many business enterprises have found that by taking a process view of their organisation they can clearly see the processes that add value to their customers and organise themselves around these processes, thus becoming more customer focused, and at the same time identifying and eliminating waste. This thesis will extend existing boundaries of knowledge by outlining how UK universities can adopt a process view of their organisation. In formulating a methodology for re-engineering the university, this researcher also hopes to make a practical contribution in the form of a generic framework for change, incorporating a set of tested tools and techniques, which could be applied to or considered by any UK university.

It should be noted that this thesis is not intended as a science policy study - and whilst the environment surrounding higher education is very much a central part of the work, the author does not set out to inform policy issues surrounding the mission of universities - but rather to look at the university from an organisational perspective.

1.4 Hypotheses & Research Questions

Although there has been much written in both academic and business literature about organisational change and renewal, as yet there have been

few techniques developed for managing the process of change in the university setting. A logical move, in the direction of developing techniques to assist universities in managing change, may be to observe what techniques have been applied in other contexts, for example in industry, and trying to adapt the more general philosophy to suit the new context.

The hypothesis put forward by the researcher is that:

- business process re-engineering may provide UK universities with a methodology for change;

- but that the contextual differences between UK universities and business enterprises are so great that existing BPR methodologies couldn't be easily adopted by universities in the UK;

- yet, existing methodologies may be used as a basis for creating a methodology designed specifically for UK universities.

In addressing these hypotheses, the following research questions are developed :

- to explore the competitive environment surrounding UK universities and to assess the need for organisational change in UK universities

- to investigate the management philosophies, models and tools which have helped turn around manufacturing and service organisations

- to explore the possibility of effectively transposing these philosophies, models and tools

- to investigate the extent of BPR activity currently underway in UK universities

- to take a closer look at a number of these initiatives and note best practice

- to construct, and seek feedback on, a methodology for organisational change in universities

- to analyse and discuss the value of the methodology

1.5 Overview and Structure

Chapter 2 sets the scene for the rest of the thesis by defining the problem. The chapter starts with a brief history of UK universities and takes the reader through to the present day and the current environment surrounding higher education institutions. The drivers for change are outlined and the author argues the case for universities, like businesses, to look at their environment and adapt accordingly. The chapter raises the research question - how can UK universities meet this challenge ? The chapter concludes by discussing the contextual differences between UK universities and business enterprises.

Having clearly defined the research objectives, Chapter 3 considers how these research objectives might be met. The author reviews the literature on management research and outlines the methodology for the remainder of the study.

Chapter 4 starts by looking at how manufacturing industries have turned themselves around in the face of a changing environment. Business

Process Re-engineering (BPR) is then examined as the latest management offering. Having established the pedigree of BPR this chapter looks at who is using BPR and what it can achieve. BPR methodologies, tools and techniques are also discussed. The chapter concludes by looking at the application of Business Process Re-engineering in the public sector and in particular at the application of BPR within the university sector.

Chapter 5 seeks to identify the extent of BPR activity already underway in UK universities. The development of a research instrument to gather this information is discussed. The results of the postal survey are then the focus of this chapter. Which UK universities are engaged in BPR activities, and how they have gone about it are documented.

Chapter 6 delves deeper into a number of the universities claiming to be undertaking BPR exercises and reports on in-depth interviews with practitioners. The drivers for change are discussed along with the methodologies employed, the problems encountered and the critical success factors.

Chapter 7 summarises the results of the primary research and discusses the findings of the research in light of the theory. Synthesising the literature review and primary research thus-far, Chapter 8 sets out to build a methodology for process improvement in UK universities. Change management tools and techniques that could be employed within this framework are also presented. The suitability of this methodology is tested using expert opinion and the validity discussed.

Finally, Chapter 9 concludes the thesis by outlining the contribution made to new knowledge and the value of the research. The limitations of the research are also considered and suggestions for further research are highlighted.

CHAPTER 2

THE CRISIS THAT WILL NOT GO AWAY ?

Business schools around the world preach the need for organisations to be lean, flexible, innovative, customer-centred, competitive and efficient. Employed in a UK university in the field of organisational change, this researcher has to ask the question - why then are we working in universities that are bloated, sluggish, bureaucratic, disdainful of stakeholder needs, non-competitive and inefficient? Are our universities organised for the needs of a bygone age? In looking for an answer this chapter starts by looking at how UK universities have evolved and developed. The chapter then goes on to consider the current environment surrounding UK universities and argues that many institutions could be faced with a crisis if they do not adapt to the changing environment. The question of how to change is then addressed. Finally the contextual differences between UK universities and business enterprises are discussed. This discussion will help to set the thesis in context.

2.1 Founding and Funding

Asked to think about universities, many of us will conjure up images of ancient seats of learning, steeped in history and tradition. But this is largely a myth. In actual fact only six UK universities (Oxford, Cambridge, St. Andrews, Glasgow, Aberdeen and Edinburgh) can claim to be older than 200 years. And less than eighteen of the current ninety UK universities (not counting the constituent colleges of the Universities of London and Wales) were founded before the death of Queen Victoria.

Before considering the environment surrounding UK universities, let us first dispel some of the myths, and put the discussion into context by looking at the real history of UK higher education.

Oxford, dating back to 1264, was the first university to be established in England. Shortly after came Cambridge (1284). In Scotland St. Andrews was the first, founded in 1411, next came Glasgow (1451), followed by Aberdeen (1495) and Edinburgh (1583). Founded on private resources, these universities were established to promote the training of the clergy, doctors and lawyers. In the process of training those professional classes, the universities came to emphasise the pursuit of truth and learning (Chaplin 1978). These six universities were, until 1832, the only universities in Britain - and together they enrolled less than 5,000 students.

It wasn't until 1832 that the number of universities increased. Founded on funds raised locally, these Victorian civic universities were established by provincial lawyers and doctors, utilitarian industrialists and Unitarian politicians. Newcastle (1932), Durham (1832), London (1836), Belfast (1845) were the first of this new wave of university. Not only did they prepare people for the medical and legal professions but also to enter engineering, science and other professional fields, many of which emerged during the industrial revolution. Indeed it was the industrial revolution, and in particular the Great Exhibition of 1851 which focused the publics' attention on the need to secure and strengthen education in science and technology. This further fuelled the growth in the university sector, with Bristol (1876), Manchester (1880), Dundee (1881), Liverpool (1881), Leeds (1884), Wales (1893), Sheffield (1887) and Birmingham (1898) all being established before the end of the nineteenth century. It was these universities, today referred to as federal and civic universities, which first adopted research into their missions. In particular it was the success of Germany, who held the university up as a centre for research, and the concern in Britain about

competition from Europe, that influenced this move. However, it wasn't until the period just before the First World War that state support for academic research came about. Thus, as Dainton (1981) comments, by 1939 most of the familiar strands of British university life - general education, vocational training, research and scholarship - had become woven together.

Nineteen sixty one saw the establishment of both Sussex and Essex. But it was the Robbins Report in 1963 that heralded the next radical change in the sector. Robbins advocated significant expansion of the higher education system, with the aim being provision of higher education courses for "all those who are qualified by ability and attainment to pursue them and who wish to do so." This increase in student numbers warranted an increase in the number of institutions of higher education and as a consequence eighteen new universities were established between 1961 and 1967. Some of these were new "greenfield" universities (Essex, Sussex, York, Lancaster, Kent, East Anglia, Warwick, Stirling) whilst other "new" universities were established by upgrading existing Colleges of Advanced Technology (Strathclyde, Brunel, Bradford, Bath, Aston, City, Heriot-Watt, Loughborough, Surrey, Salford).

This growth in higher education continued and by 1991 there were 56 major institutions in the university sector, and a further 33 polytechnics and 49 colleges in the higher education sector. At this juncture polytechnics and colleges established largely in the 1960s received public funding which was administered by the Local Education Authorities (LEAs). The allocation of funds was partly determined on the advice of the National Advisory Body for Public Sector Higher Education (NAB). However, change was afoot again, and in 1987, the White Paper "Higher Education: Meeting the Challenge" proposed major changes to the organisation of higher education. These changes were put into place by the Education Reform Act of 1988 which, among other reforms, saw the establishment of two new councils who

between them assumed responsibility (in April 1989) for funding universities, polytechnics and higher education colleges. These new councils were the Universities Funding Council (UFC) and the Polytechnics an Colleges Funding Council (PCFC).

Change came again in May 1991 when the Government's White Paper "Higher Education: A New Framework" proposed a number of substantial changes, the most significant of which was to be the abolition of the binary line between universities and the polytechnics and colleges. In this White Paper the Government stated "the real key to achieving cost effective expansion lies in greater competition for funds and students..... that can best be achieved by breaking down the increasingly artificial and unhelpful barrier between universities, and the polytechnics and colleges". This came into effect in March 1992 when the Further and Higher Education Act 1992 was passed by Parliament - establishing a unitary system of higher education. New funding councils were set up, with separate Higher Education Funding Councils for England (HEFCE), Scotland (SHEFC) and Wales (HEFCW). Funding of higher education in Northern Ireland continued to be the responsibility of the Department of Education of the Northern Ireland Office.

Thus at the time of writing there are one hundred and fifteen university institutions in the UK, counting separately the constituent colleges of the federal universities of London and Wales. If Wales and London are counted as single institutions, the figure is ninety. Table 2.1 lists the institutions holding university status in the UK at the time of writing.

England • Anglia Polytechnic University • Aston University • Bath University • Birmingham University • Bournemouth University • Bradford University • Brighton University • Bristol University • Brunel University • Buckingham University • Cambridge University • University of Central England in Birmingham • Central Lancashire University • City University • Coventry University • Cranfield University • De Montford University • Derby University • Durham University • University of East Anglia • East London University • Essex University • Exeter University • Greenwich University • Hertfordshire University • Huddersfield University • Hull University • Humberside University • Keele University • Kent University • Kingston University • Lancaster University • Leeds University	• Leeds Metropolitan University • Leicester University • Liverpool John Moores University • Liverpool University • London Guildhall University • London University • Loughborough University • Manchester University • Manchester Metropolitan • Middlesex University • UMIST • Manchester Business School • Newcastle-upon-Tyne University • North London University • Northumbria at Newcastle University • Nottingham University • Nottingham Trent University • Open University • Oxford University • Oxford Brooks University • Plymouth University • Portsmouth University • Reading University • Royal College of Art • Salford University • Sheffield University • Sheffield Hallam University • Southampton University • South Bank University • Sunderland University • Sussex University • Surrey University • Staffordshire University • Teeside University	• Thames Valley University • University West of England, Bristol • Westminster University • Wolverhampton University • Warwick University • York University Scotland • Aberdeen University • Abertay University • Dundee University • Edinburgh University • Glasgow University • Glasgow Caledonian University • Heriot-Watt University • Napier University • Paisley University • Robert Gordons University • St. Andrews University • Stirling University • Strathclyde University Ireland • Queens, Belfast • Ulster Wales • Glamorgan • University of Wales

Table 2.1: Universities in the UK, May 1998

2.2 A Homogeneous Group ?

Whilst the outsider might talk about "universities" as though they were a homogeneous group, this researcher would argue that this is far from the truth. This argument is well documented in the literature (see for example Livingstone 1974, Barnett 1990, Scott 1995). The demarcation between "old" and "new" universities stemming back to the binary divide is still widely regarded as they key operational divide in British higher education. However this researcher would argue that the diversity of UK universities goes far deeper than this. Just visit a number of universities in the UK and you get a feel for the plurality of the sector. Apart from just "feeling" different, diversity can be seen in a number of ways, including:

- governance
- structure
- culture
- surroundings (urban, campus etc.)
- buildings (new, traditional etc.)
- in the balance between teaching and research
- in the courses offered
- in the modes of teaching and methods of study
- in entry standards
- in market orientation (e.g. regional, national, international)
- in reputation
- in the student population (gender, ethnic diversity, age etc.)

2.3 Universities As One Element of the Higher Education System

Before commencing an analysis of the environment surrounding UK universities, it is worth reiterating the point that universities are just one element of the UK higher education system. At the time of writing there are 148 higher education institutions in England, 21 in Scotland, six in Wales and four in Northern Ireland, a total of 189. A higher education institution is defined by the Higher Education Funding Council for England as an institution funded by the Council. It is not an institution where higher education takes place - many of these are funded by the Further Education Funding Council. Four higher education institutions are in the process of becoming universities Bolton, Cheltenham & Gloucester, Nene (Northampton) and Roehampton and several UK regions are campaigning for new universities (e.g. Lincoln, and the Highlands and Islands). In these cases, as with the University for Industry, the remit straddles the further/higher education interface. A number of colleges in the further education sector who are already providing higher education courses have their sights set on higher education status (see for example *The Times Higher,* March 17 1998 p4).

In recent years we have seen increased collaboration between universities and institutions in the higher and further education sectors. The trend towards collaboration is being encouraged by the Government and looks set to accelerate if proposals on extended national and regional credit accumulation and transfer materialise. This is particularly likely where expensive resources like teaching laboratories are involved. In recent years we have also seen an increase in mergers between specialist higher education colleges, particularly in teacher education, into universities. In some cases, universities are taking over further education colleges in which there is a significant block of higher education work.

In recognition of the changing environment surrounding higher education, the Conservative Government launched an inquiry into higher education. This process of inquiry commenced in May 1996 when Ron Dearing was asked to chair the National Committee of Inquiry into Higher Education. This inquiry was supported by all political parties. The Committee's objective was to make recommendations on how the purposes, shape, structure, size and funding of higher education (including support for students) should develop to meet the needs of the UK over the next twenty years. The Committee were asked to recognise that higher education embraces teaching, learning, scholarship and research. Over a 14 month period the Committee consulted widely and commissioned studies from experts in their field. On 21 July 1997 the Committee submitted their report entitled "Higher Education in a Learning Society".

Naturally any analysis of the environment surrounding universities coming so soon after this report must borrow heavily from this report. It should be recognised however that Dearing's Committee was asked to look at Higher Education in the UK, and not just the university sector (which is the main focus of this thesis).

2.4 The Macroenvironment

Having set the scene with a potted history of UK universities and the UK higher education scene, let us now turn our attention to the environment within which UK universities are operating. Borrowing from the marketing literature, we will consider the macroenvironment surrounding UK universities. That is to say we will look at the social, technological, economic and political forces that surround UK universities. The forces discussed in this section are not specific to any one university, but rather will impact on any institution working within the sector.

2.4.1 Social Factors

2.4.1.1 Participation in Higher Education

Whilst commentators such as Peters (1992) and Reeves (1988) would have us believe that higher education is in "crisis", Barnett (1992) points out that, at least in terms of the number of people involved in it, higher education is a growing institution. However he also draws our attention to the fact that, "not only is higher education facing pressing problems of funding, structure, resources and number of students, but it is also undergoing a fundamental shift in its relationship to society". For a start, the UK now has a mass education system: there are many universities competing for students and for resources; universities employ many more staff; and teach and research a wide variety of subjects; students come from a wide range of backgrounds and academic abilities range more widely.

For the last 35 years, the general trend across the developed world has been for increasing participation in higher education. In the UK there have been periods of rapid growth, most notably in the late 1960s following the Robbins Report (1963) and from 1988 to 1993. The UK higher education system is now far larger than before the Robbins Committee report. In 1996/97 there were more than 1.6 million students studying at higher education level in UK higher education institutions – over 1.1 million studying full-time or on sandwich programmes and over a half a million part-time. In addition, there are estimated to be in the region of 200,000 higher education students in further education colleges.

Consistent data about all students are not available for the full period from the early 1960s to the present, but Figure 2.1 shows the scale of the increase in full-time, UK students.

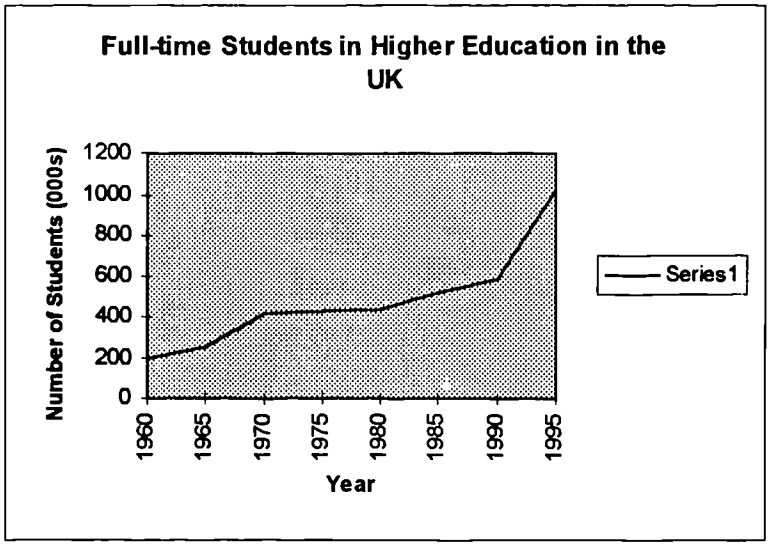

Figure 2.1: Participation in Full Time Higher Education
Source: Dearing Report 1997

At the time of Robbins only one young person in eighteen entered full-time higher education. Today the figure is nearer to one in three for the country as a whole and around 45 per cent in Scotland and Northern Ireland. Forecasts suggest that, if current patterns of participation continue, more than half of today's school leavers will experience higher education at some time in their lives (see for example CVCP 1996).

Although the numbers in all categories of students have expanded, postgraduate numbers have grown fastest in recent years - three of the most obvious reasons being the increase in the number of people holding first degrees, universities realising that this is a growing and potentially lucrative market, and graduate uncertainty regarding employment.

The overall balance between full and part-time study has not changed significantly over time, but students of the Open University now make up a substantial proportion of all part-time students. Within the totals, there has been a marked increase in the proportion of postgraduate students who study part-time. A high proportion of students who are studying part-time are in employment.

We have also seen a change in the profile of students, with a large increase in mature students. In fact, in 1995/96, 58 per cent of entrants to higher education were mature. (HESA 1996). There has also been an increase in overseas students. In 1994/95, over 10% of all students studying in UK higher education institutions were from overseas, with 33% of overseas first degree students coming from Asia. Approximately 20% of postgraduate students studying in the UK are from overseas (HESA 1996).

An important element in the growth in higher education has been the increase in participation by women. The Robbins report foresaw growth in women's participation but, even by 1979/80, women made up only 37 per cent of students. Since then participation by women has increased rapidly so that they constituted 51 per cent of students in 1995/96 (Dearing 1997). Another characteristic identified in the Robbins report (1963) was the under-representation in higher education of the children of manual workers. Participation by young people from socio-economic groups IV and V (semi-skilled and unskilled) has increased in recent years. For example, the participation rate for group V has at least doubled between 1991/92 and 1995/96. But their participation rate is still only a fraction of that for the children of professional families.

As student numbers have grown, the number obtaining degrees each year and the proportion of graduates in the population has increased. In 1994/95, more than 230,000 first degrees were awarded in the UK and nearly 60,000 sub-degree qualifications (HESA 1995). By 2001 there are expected to be just under 4 million graduates in the UK workforce, double the number in 1981 (Dearing 1997).

A major consequence of the expansion is that more people have experience of universities, and this trend looks set to increase. Universities therefore affect more of the population, nearly every family in the UK will be touched

by the university system in some way. Thus universities are undergoing a fundamental shift in their relationship to society. Ronald Barnett (1997), professor of higher education at the Institute of Education, University of London, agrees that universities relationship with society is changing on two counts - firstly in that people now want different things out of universities and secondly on the basis that what counts as knowledge is changing in society.

Indeed, what goes on in universities is now much more visible to the general populous and people want more information and want to become involved in influencing what goes on in universities. Whilst parents are interested in the quality of their children's education, graduates are interested in the continued reputation of their institution (as it reflects on them), industry are becoming more involved in course content and design, and the Government are also encouraging industry to influence the allocation of resources for research (Becher & Kogan 1992).

2.4.1.2 Subjects Studied

The balance between subjects studied by full-time students has changed over time. Although all subjects have grown as total student numbers have grown, the lowest growth is in engineering and technology. The largest increase, in 'medicine', is attributable mainly to increases in the numbers studying subjects allied to medicine. To date, the balance of subjects studied at first and higher degree level in the UK is similar to the pattern across the Organisation of Economic Co-operational Development (OECD) countries, apart from a lower than average proportion who have studied medicine and a higher than average proportion who have studied science and mathematics. Concerns about the balance between subjects of study have been expressed, especially but not exclusively, by employers and professional bodies (Dearing 1997). They perceive a shortage, in particular, of those studying certain branches of engineering and there is concern

about the number entering the hard sciences. There are also worries about intakes to teacher training and modern languages programmes. These concerns parallel those about the quality of entrants. Generally speaking, less popular subjects have less demanding entry requirements.

Students can choose from a much greater array of types of higher education programme now than at the time of the Robbins report. As knowledge has expanded, whole new subject areas (such as molecular biology) have opened up. Preparation for many occupations, for example the professions allied to medicine, now takes place partly in higher education. The recognition of the benefits of cross-disciplinary approaches has led to a rich new range of programmes and techniques. As encouraged by the Robbins report, higher education institutions have developed combined honours programmes, allowing students to study more than one subject in depth. The move to modularization has offered students greater flexibility to combine course elements to build programmes which suit their individual needs and interests.

Increasingly, institutions are introducing the development of personal transferable skills as part of programmes. Such activity has been spurred by the demands of employers and aided by initiatives such as Enterprise in Higher Education (1990). Still, however, many employers are dissatisfied with the current level of skills exhibited by graduates (Dearing 1997). The largest single expression of dissatisfaction comes from the 25 per cent who would like graduates to have better communication skills.

2.4.1.3 Modes of Learning

A wider variety of modes of learning is now available. Sandwich programmes, incorporating an element of work experience, have been developed. The work of the Open University, and other organisations has

transformed distance learning opportunities. Universities are in many cases working with employers and professional bodies to develop programmes, tailored to the needs of particular occupations or professions, which can largely be taken by students in the workplace. Dearing highlighted a desire by employers, for students to gain more work experience. This is seen as particularly valuable by small firms who cannot afford training or support for a long induction period. They need new members of staff to be able to operate effectively in the workplace almost immediately.

2.4.1.4 Staffing in UK Universities

Higher education is a major UK employer. In 1995 the Census of Employment recorded 382,000 people employed in higher education - 1.8 per cent of the total UK workforce in employment. There is a shortage of other information about the full range of staff in higher education but Table 2.2 gives national estimates, based on a survey for the Committee of Vice-Chancellors and Principals (CVCP) which covered around 70 institutions.

HESA (1996) suggest that the total expenditure of the UK higher education sector on "academic staff" was in excess of £3.54m in 1995/96 and expenditure on "other staff " exceeded £2.59m in the same period.

It is acknowledged though that the increase in academic staff numbers in higher education has been proportionately smaller than the increase in the number of students. Staff have faced increased teaching loads, larger teaching groups and, in many cases, new kinds of student. At the same time, the volume of research carried out has increased significantly. Increased requirements for accountability have led to new demands on staff. Delegation of budgets and management decisions to individual departments have required academics to take on new tasks. Taken together, these developments represent a significant increase in the volume of work for

individual academics and a change in its nature. Administrative and support staff have faced similar challenges.

CATEGORY	FULL-TIME	PART-TIME	TOTAL
Senior Management (grade 6 +)	5,500	200	5,700
Other Management	16,000	1,800	17,800
Teaching Staff	71,000	20,900	91,900
Research Staff	29,600	3,700	33,300
Secretarial and Clerical	44,500	18,600	63,100
Technicians	26,700	3,100	29,800
Security	2,700	200	2,900
Janitorial and Cleaning	5,800	18,600	24,400
Catering Staff	2,000	5,600	7,600
Residence Staff	4,400	8,300	12,600
Workshop etc. Assistants	1,600	200	1,900
Labourers, Gardeners etc.	2,900	400	3,300
All Other Staff	12,600	10,800	23,400
TOTAL	225,400	92,400	317,700

Table 2.2 : Total Employment in Higher Education Institutions by Category 1996/97

Source : CVCP

The survey of academic staff carried out for the Robbins Committee found that, in the early 1960s, during term-time, university lecturers spent 38 per cent of their time on teaching, guidance and examining, 28 per cent on research and 14 per cent on administration and meetings with the rest spent on a variety of professional activities. A survey of academic staff, conducted as part of the Dearing inquiry (1997) which covered the whole year not just term-time, showed that they now typically spend 35 per cent of their time on teaching, guidance and assessment, 20 per cent on research and 15 per cent on administration and management (30 per cent for professorial staff) with the rest spent on other professional activities. Dearing's survey showed

that academic staff are not content with the way they spend their time. They would like to spend less time on administration and management and to transfer the time to research.

Over half of those doing research claim to be doing it outside normal working time. It is also evident from Dearing's survey that academic staff are concerned about the quality of support they can offer to students and feel it has declined over the last five years. The Association of University Teachers (AUT) carried out a survey based on a random sample of AUT members in 68 institutions (they received 2600 returned diaries). in Long Hours, Little Thanks (1994) they report the findings of this survey which showed that for lecturers, administrative tasks account for ~18 hours per week - an hour more than for teaching and seven hours more than on personal research.

Many administrative and support staff also feel that they have had to take on large additional amounts of work, are working more than their contracted hours, and cannot keep up with what is expected of them. Dearing reported feeling of scepticism from the academic community about the need for the present scale of management and administration activity in higher education, and about its quality. Administrative and support staff are not sceptical about the place of management, but see a need for it to become more effective. There is also a general confusion about the place of management and administration and the differences between the two.

It is interesting to note the growth in administrative staff in UK universities. In 1987/88 the ratio of administrative staff to academic staff was 1:14 or 7% (USR 1988) but by 1996/97 this figure had grown to approximately 1:4 or 25% (based on HESA figures).

The terms on which staff are employed have also changed significantly over the last few years. Legislation enabled university statutes to be changed to remove academic tenure for new or promoted staff. In addition, an increasing proportion of staff have been recruited on fixed-term contracts. This has been mainly a response to research funding, which is often available only on a short term basis. The concerns about lack of career prospects and job insecurity among young researchers is well-documented (e.g. AUT 1998). A significant minority of teaching staff are now employed on fixed-term contracts too. Promotion opportunities and financial rewards are on the whole associated with research excellence, rather than with excellence in teaching. It is interesting to note that 1994/95 saw a 26% increase on the previous years figures in the number of staff employed on a part-time basis in UK universities.

There is a wide range of non-academic staff employed in higher education and, for some of them, the distinctions from academic staff are becoming increasingly blurred. Many such staff, for example librarians, technicians and computer support staff, are directly involved in guiding and supporting students. With the widespread introduction of modular programmes, administrative staff have taken on new tasks in guiding and tracking students through their choice of programmes. Staff with entirely new skills and roles, for example in marketing or contract management, have also been recruited in recent years to support the more commercial orientation of at least some of higher education's activities.

2.4.2 Technological Factors

2.4.2.1 The Learning Environment

The learning environment of students today is quite unlike that in the 1960s. The dramatic increase in student numbers, which has not been matched by

a proportionate increase in funding, staffing or other resources, has resulted in increased class sizes, decreased class contact time for students, and an increase in students studying off campus. Despite these major changes, the traditional teaching methods of higher education still predominate. According to a survey carried out for the Dearing inquiry, the teaching methods experienced by the highest proportions of students were lectures (98 per cent); seminars and tutorials (91 per cent); essays (82 per cent); and projects and dissertations (82 per cent). Although lectures still predominate, research carried out on behalf of the Dearing enquiry showed that over the last five years staff have been widening their repertoire of teaching methods. The methods of teaching which the fewest students in this survey experienced were individual sessions with teaching staff (30 per cent), work placements as part of a sandwich course (15 per cent), and work experience (16 per cent).

2.4.2.2 Communications and Information Technology

The potential of communications and information technology as a tool for teaching and learning is immense. Some such as Daniel (1996) and Wilson (1996) talk of 'the virtual university' being the thing of the future. The term 'virtual university' is being used to describe the networking of existing universities into a new kind of mega-university. The idea is that, with a few clicks on your mouse, you can take courses from numerous universities around the world. All we can say at this stage is that communications and information technology are likely to change the face of higher education as we know it. Computer Aided Learning (CAL) is gaining support and funding in most UK universities.

In SuperJANET, the UK is said to have the most advanced academic information technology network in the world. Various projects and initiatives have been carried out, with varying degrees of success, to try to exploit the

potential of new technology for learning and teaching. The largest of these, the Teaching and Learning Technology Programme (TLTP), has involved investment of over £32 million by the funding bodies to launch over 70 projects to develop computer-based teaching and learning course materials. This has had some beneficial outcomes, and students have reacted positively to the flexibility offered, but communications and information technology are far from being embedded in the day-to-day practice of learning and teaching in most higher education institutions. One barrier is the shortage of staff skilled in developing computer-based course materials, but the main reason is that many academics have had no training and little experience in the use of communications and information technology as an educational tool.

Information systems and technologies are also changing the way research is carried out, and knowledge accessed. Already the Internet, email and video-conferencing have radically improved collaboration between researchers in different institutions, both within the UK and world-wide.

Universities are beginning to realise the benefits of communications and information technology in other areas of their business too, and some have started developing systems to exploit the administrative gains which communications and information technology makes possible. Smartcards are increasingly in use by staff and students, simplifying security, library access and control, student and staff administration, time-tabling and so on. Management information systems in universities are also being developed. The pace of development of the technology is such that significant further potential can be realised.

2.4.3 Economic Factors

CVCP (1996) state that "universities are big business, with an average annual turnover of £100 million". HESA (1996) figures show that in 1994/95 the income of UK higher education institutions exceeded £10 billion. Dearing backs this figure up and states that this represented about 1.4 per cent of Gross Domestic Product (GDP).

In 1995, 140 higher education institutions reported a surplus or break-even while 41 reported a deficit and the sector as a whole had a surplus of £237 million. In 1996 the number in surplus had declined to 115 while the number in deficit had increased to 66 and the surplus for the sector as a whole had reduced to £112 million. HEFCE analysis of 1996 financial forecasts shows that the higher education sector as a whole is expected to be in deficit from 1998.

2.4.3.1 Public Funding

Public funding for institutions flows through a variety of routes. Research funding comes in the form of block grants from the Funding Bodies, project grants from the Research Councils, and contracts from government departments and other public bodies. Funding for teaching comes mainly from the various government Funding Bodies in the form of block grants, and from local authorities (who are reimbursed by central government) for fees for students who receive mandatory grants. The balance between the two streams of funding has changed over time as the Government has used them as an instrument to influence institutional behaviour. Institutions are increasingly concerned about the complexities of interacting with a number of public funding bodies which have different accountability arrangements. Reporting to different bodies has placed an increased administrative burden on both academics and administrators.

While growth in student numbers has been accompanied by real growth in total public expenditure on higher education, the level of public funding per student (measured in constant prices) has fallen since at least 1976. While a reduction in unit funding was intended by the Government, institutions themselves contributed to it when, in response to funding incentives, they opted to recruit additional students at lower than average levels of unit funding to maximise their overall income.

Following Dearing's Report, the Government now plan to introduce tuition fees for students - which in effect will mean that the majority of students will be expected to pay tuition fees of approximately £1000 per academic year. With students paying fees, there is concern that students will be expecting higher service levels from their institutions - and that the relationship will become one of customer and supplier.

Public funding for research has also dropped in real terms and the last decade or so has seen an erosion of the nation's research equipment and infrastructure. A recent survey of the state of the equipment in universities found it to be less than adequate. It estimated that £474 million will be needed over the next five years to bring the equipment in the public research base up to a level which will allow it to carry out the volume of research expected to be funded. Nearly 80 per cent of departments reported important areas in which researchers were unable to perform critical experiments because of insufficient equipment funding. Of equipment used for research, 17 per cent had poor or very poor capability, and 60 per cent of the stock had a remaining useful life of five years or less. In particular, top-rated departments accounted for 74 per cent of the need.

2.4.3.2 Private Funding

Although higher education in the UK is widely perceived as substantially publicly funded, private funding is a significant and growing feature, currently contributing around a third of the income of higher education institutions.

Private sector support for research in universities has risen steadily for the past ten years to £169 million in 1995/96. This is only a small proportion of total research and development expenditure by industry, but this is not surprising given that only 6 per cent of industry's spending is on basic research. The pre-1992 universities have had the most significant growth in industrial research income with a real increase of over 80 per cent in ten years from 1984-85 to 1993-94.

2.4.4 Political Factors

2.4.4.1 Quality of Higher Education

Quality and accountability are very much a driving force in today's academic world. Quality assessment systems for higher education have been instituted across Western Europe - including UK, France and the Netherlands. Whilst there are many differences in the quality incentives currently being developed within Europe, there are many common elements emerging. We are witnessing a strengthening of the evaluation function by government, the establishment of national evaluation committees, the inspectorate, the role of co-ordinating and planning bodies, as well as the search for quality standards and measures of institutional performance (De Weert 1990).

As a result of the 1992 Further and Higher Education Act, there are now two major forms of quality assurance in the UK known as 'audit', carried out by

the Higher Education Quality Council, and 'assessment', carried out by the Funding Councils, which cover all higher education institutions. These functions have included a quality enhancement component. The two activities are now being made the responsibility of a single body, the new Quality Assurance Agency (with the exception of assessment in Scotland which remains with the Scottish Higher Education Funding Council).

2.4.4.2 Funding & Performance

From the mid 1980s it has become accepted that support from the higher education Funding Bodies for research should be allocated selectively between institutions, according to excellence. The Research Assessment Exercises, the first of which took place in 1986 and the fourth in 1996, have been used as the basis for determining excellence. The results have been used over time to concentrate funds on the highest quality departments. In England, for example, five universities received almost one third of the available research funding. The Research Councils also distribute their project grants on a competitive basis, according to judgements from other experts in the field drawn from the UK and abroad. About 50 per cent of Research Council grants are awarded to individuals in 12 universities.

2.4.4.3 Competition

We have already noted that the Conservative Government saw the key to achieving cost effective expansion as being through increased competition. To date there is little evidence to suggest that the new Labour Government thinks any differently.

Thirty five years ago the Robbins Report recorded the existence of 31 universities. Higher education was also provided in some other institutions, principally colleges for the education and training of teachers and institutions

of further education. We have seen that following the Robbins report, a number of additional universities were created in the 1960s. The same decade saw the establishment of the first polytechnics and of the Open University, now the largest university in the UK as measured by total student enrolments. Today there are 179 higher education institutions in the UK of which 115 are titled universities (which include the various constituent parts of both the University of London and the University of Wales). In addition, there are many further education institutions offering higher education programmes, mainly part-time sub-degree programmes.

Most of the growth in higher education student numbers in the last few years has been concentrated in the 1992 universities, colleges of higher education and colleges of further education. Since the abolition of the binary line and the introduction of Funding Councils covering all higher education institutions, there is concern that all institutions are becoming more like each other with a consequent loss of diversity. This has been attributed in part to the funding methodologies for research and teaching, and in part to some convergence of institutional ambitions. All higher education institutions entered the last Research Assessment Exercise, because it is one of the few opportunities for securing additional funding, but many received little or no financial return from it. There are few funding incentives to encourage teaching excellence.

2.5 The Microenvironment

Having considered the macroenvironment surrounding universities, it is clear that the external environment around universities is clearly changing and affecting all universities within the sector. Next we look at the forces which concern individual institutions to varying degrees.

2.5.1 Customers

Like it or not, the fact is the UK now has a market-led higher education system. Customers, individuals and corporations - demand products and services designed for their unique and particular needs. The problem universities have is in defining who their customers are. Table 2.3 highlights the multifaceted nature of universities and the diverse markets they operate in.

What are the Roles of a University ?
provider of undergraduate courses
provider of postgraduate courses
provider of short courses
sources and developer of learning resources
centres for fundamental research
centres for strategic research
applied research
providers of technical expertise and facilities
agent for economic re-generation
developers of the mind/experience
a focus for the local community

Table 2.3: The Roles of a University

Source: MacBryde & Bititci (1996)

The most obvious customer is the student - perhaps even more obviously now that they are being asked to pay tuition fees. If we look at employers as being customers of the university then we see that many are picking particular courses to recruit graduates from and then getting involved in the design and even teaching of these courses.

Not everyone would agree that this 'consumerism' is a good thing. Neville (1991) says "it seems apparent that Western society has recently been worshipping the god of the market place with excess devotion....Educational institutions now take their wares onto the market place and hawk them to

whoever will buy. Debates about what it is worth teaching have been replaced by debates about what will sell... there is plenty of attention to communication, but rather less to the notion of what is worth communicating. Substance gives way to process and exchange."

Customers expect more - with new offerings on the market they can demand more. A potential student recently phoned this researcher (who also deals with student recruitment) to enquire if lecturers supplied notes to help students study (as opposed to having to take notes in lectures) - apparently another local university do this - and before choosing which university to attend he wanted to know if we could guarantee the same service!

But as Table 2.3 indicates, students are only one customer grouping. Industrial sponsors and users of research and services are another key customer grouping. The State may also be considered a customer as universities rely on The State for funding. Employers, parents, and society at large could also be viewed as "customers" if universities were to adopt a market orientation.

2.5.2 Competition

We have already seen that there is increased competition in all the universities' "business areas" (as suggested in Table 2.3). In terms of the market for students, currently supply of places on university courses exceeds demand - whereas before aspiring students jostled for places at university - today it is the universities who are jostling for good potential students. Recruitment, where once a selection process is now a sales exercise. Universities, faculties, departments, courses cannot guarantee that they will reach their 'targets'. Academics and administrators alike are having to put considerable time and effort into 'selling' courses.

And it is not just other universities and colleges that are providing the competition. Hague (1991) argues that universities have up until now been protected by virtual monopolies, firstly natural monopolies such as brain power and physical resources and secondly by man-made monopolies, for example the power bestowed by government to certain institutions to confer degrees. However he predicts that "over time the growth of the knowledge industries will give organisations outside the university the potential to erode these monopolies". We are already witnessing this in the USA, with the establishment of "corporate" universities (for example Motorola University) and closer to home with both private and public research establishments competing with universities for research funding.

In other business areas, such as research and consultancy, again universities are up against tough competition. In some instances more time is being spent on writing proposals than in actually carrying out the work. Yet universities are not skilled in such "competitive tendering".

2.6 Driving Forces for Change in Universities

In summary then, the higher education system in the UK has grown significantly since the early 1960s. In this chapter we have documented the forces in the external environment that are pushing change. Internal forces are also driving the need for change. As universities grew to accommodate the expansion, they took on more staff and processes expanded. UK universities have in the majority of cases developed cumbersome bureaucracies which have over time grown. Rules, regulations, and procedures have grown out of internal and external necessity. However, we now have a situation where employees only see and understand part of the process. Time and money are consumed by control and approval processes that were historically justified by administrators for control reasons - but

which may now be costing universities more than the savings they were intended to produce.

2.7 So Do We Have a Crisis ?

Hopefully this chapter will have demonstrated that changes in both the external and internal environments surrounding universities mean that universities have to change, become more customer focused and be able to respond to continuous change. Unfortunately, as we shall see in subsequent chapters, the current formalised, traditional structures and processes in place in the majority of UK universities don't support such developments. Nor can universities continue to afford the expensive 'glue' and the attendant overheads that currently hold our universities together. Something has to be done....

2.8 Next Question : How to Change ?

In 1990 Michael Hammer's seminar paper "Re-engineering Work: Don't Automate, Obliterate" appeared in the Harvard Business Review. In it, Hammer observed that the majority of American corporations were organised around the principles of division of labour. He argued that given: the pace of change; changing customer requirements; increased competition; quality initiatives and developments in technology, that this was no longer an effective means of organising work. His solution was a radical redesign of work around business processes - Business Process Re-engineering.

This chapter has demonstrated that UK universities are facing similar changes in their environment. Thus we have to ask ourselves, if UK universities can suffer the same malaise that effects large, profit making corporations, then should they not be considering taking similar steps to

redesign themselves as we have seen successfully employed in other sectors?

Lo (1997) draws attention to the fact that universities, like manufacturing industry have diversified in the face of increased competition, offering new courses and services to both traditional and new markets. The problem comes when these new activities are based largely on the expertise of existing academic staff, and supported by administrative systems designed for an earlier environment. Coupled with this, staff in universities are also dancing to the tune of academic, professional and financial requirements imposed by various stakeholders. Lo (1997), talking about engineering education in particular, calls on engineering departments to get back to basics - and to focus on activities associated with their own competencies. Hague (1991) echoes these sentiments when he gives the advice, "in private business, a way to excellence is today seen as sticking to one's knitting", being quite clear what one is good at and refusing to be drawn into activities which would divert the business from that. Universities should do the same" .

It is the researcher's opinion, given the evidence uncovered so far (in Sections 2.5 and 2.5), that universities must look at their key processes and eliminate waste. They can no longer contrive to add non-value adding activities to an increasingly over-burdened administrative system. UK universities need to simplify their processes. This researcher however fully recognises that UK universities cannot simply be regarded as business enterprises. Thus, Section 2.9 discusses the contextual differences between UK universities and business enterprises. However, it is postulated that UK universities can learn many valuable lessons from corporate business and it is further postulated that a methodology for business process re-engineering can be developed to suit the context of the university.

2.9 Contextual Differences

An appreciation of the contextual differences between UK universities and organisations in the private sector would, at this stage, provide useful insights into the complexity of the sector and highlight considerations to be taken into account when selecting or developing a methodology for change. Thus the major differences observed by the researcher are highlighted in Table 2.4. It should be noted that these contextual differences have been drawn largely from the higher education literature and from observation. It is anticipated that these will be further developed through the course of the research. The researcher fully recognises that the statements made at this stage are generalisations and do not apply to all business enterprises.

What Makes Universities Different from Business Enterprises ?
UK universities have diverse customers and stakeholders. Organisations within the private sector will have a clearer picture of who their customers are. (See for example Peeke 1994 or Allen 1988)
UK universities obtain funds from taxpayers and from private sources. Organisations within the private sector will almost exclusively obtain funding from customers and shareholders. (See for example Peters 1992 or Scott 1989)
UK universities are not profit making organisations. Organisations within the private sector do aim to be profit making. (See for example Schuller 1995 or Williams 1989)
UK universities lack clarity in objectives and have difficulty in measuring performance. Organisations within the private sector have clearer objectives and hence performance measurement is made easier. (See for example Johnes & Taylor 1990 or Cave, Kogan et al 1988)
Individuals within UK universities will not necessarily share common goals or even view the organisation in a similar light. Organisations in the private sector tend to try to align individuals goals with organisational goals and crate a shared vision. (See for example Noble & Newman 1993 or Lockwood & Davies 1985))
UK universities have a large percentage of "autonomous professionals" working within their boundaries. (See for example Nixon 1996 or Lockwood & Davies 1985)
UK universities suffer from lack of leadership and vision, with decisions being made by committees and with a Vice Chancellor on a fixed term in office. Organisations within the private sector, by and large, have clearer leadership and vision and greater stability at the top. (See for example Bourgeois & Nizet 1993 or Thomas 1988)
UK universities, as receivers of public money, and as providers of a public service, are very open to public scrutiny and need to be accountable. Organisations within the private sector are accountable to their shareholders. (See for example Davies 1994 or Loder 1990)
UK universities are highly influenced by political changes. Organisations in the private sector, are to a lesser extent influenced by political change. (See for example Midwinter 1993 or Shattock 1989)
UK universities tend to be less flexible and unable to make decisions quickly or implement change quickly (because of systems of governance, public accountability, length of degree courses etc.). Organisations within the private sector tend on the whole to be more flexible, reach decisions quickly (directed by one individual or management group) and implement changes more rapidly. (See for example Hackman 1985 or Jarrett 1985)
UK universities, on the whole, have a great deal of bureaucracy. Organisations within the private sector have, in general, tried to minimise bureaucracy. (See for example Warner & Crosthwaite 1995 or Weick 1976)
UK universities have less of a performance related culture in terms of human resource management. Organisations within the private sector are moving towards individual performance related rewards. (See for example Kogan 1994 or Merican 1993)

Table 2.4: Major Differences Between UK Universities and Organisations within the Private Sector

2.10 Chapter Conclusion

This chapter has demonstrated that universities are being forced to change:

- to become more customer focused; to become more flexible;
- to cope with changes in the marketplace;
- to become more efficient and cost effective to content with financial constraints;
- to address quality and accountability issues;
- to use technology more effectively ;
- and to become more proactive in shaping the universities of the future.

Internal stresses and strains are also necessitating change in many cases.

It has been suggested that business process re-engineering may provide UK universities with a methodology for change. However, this chapter has highlighted the many contextual differences between UK universities and business enterprises. It is implied that these differences are so great that existing BPR methodologies couldn't be easily adopted by universities in the UK. The remainder of this thesis will set out to prove this and to prove also that existing methodologies may be used as a basis for creating a methodology designed specifically for UK universities.

CHAPTER 3

METHODOLOGY

This chapter starts by restating the objectives of this research project. The ensuing discussion with regard to current thinking on the design of, and methods employed in, management research is thus set within the context of the aims of this research project. This allows the research methods and instruments most appropriate for the project to be designed. Justification is made for the choice of research method, making reference to appropriateness of the research instruments, the reliability of the data, the validity and relevance of the data collection.

3.1 Hypotheses & Research Questions

We have already stated in Section 1.4 that the focus of this research is the application of Business Process Re-engineering to the UK university sector. In particular this project sets out to demonstrate that:

- business process re-engineering may provide UK universities with a methodology for change;
- but that the contextual differences between UK universities and business enterprises are so great that existing BPR methodologies couldn't be easily adopted by universities in the UK;
- yet, existing methodologies may be used as a basis for creating a methodology designed specifically for UK universities.

It is the aim of the researcher to develop such a methodology that could potentially be adopted by any UK university. The research questions that need to be addressed in order to reach this outcome were defined in Section 1.4 as being:

1. to explore the competitive environment surrounding UK universities and to assess the need for organisational change in UK universities;
2. to investigate the management philosophies, models and tools which have helped to turn around manufacturing and service organisations;
3. to explore the possibility of effectively transposing these philosophies, models and tools;
4. to investigate the extent of BPR activity currently underway in UK universities;
5. to take a closer look at a number of these initiatives and note best practice;
6. to construct, and seek feedback on, a methodology for organisational change in universities;
7. to analyse and discuss the value of the methodology.

3.2 Outline Approach

The last chapter should have convinced the reader of the need for change within UK universities. We have established that the environment surrounding institutions of higher education has changed dramatically in the past few years, and like many manufacturing and service organisations faced with similar changes, universities must change and adapt to their new environment. The next question is how to change. The remainder of this thesis, aims to provide one solution, by taking a structured approach and

answering the research questions set down in Section 1.4. Having answered our research questions, the final development aim of this project is to devise a methodology that could be adopted by a UK university ready and willing to change.

So how do we intend to reach this state? The initial tasks identified to successfully meet the end goal are as follows:

1. conduct a review of recent research on business process re-engineering, with particular attention to the methodologies employed;
2. undertake a survey of UK universities to establish the extent of BPR activity within the sector;
3. carry out in-depth interviews with personnel at universities undertaking BPR initiatives with a view to establishing the drivers for change, the methodologies employed and the successes and problems encountered;
4. at this stage it should be possible to identify best practice and to use this knowledge and understanding to produce a draft methodology which could be used to guide other universities through the process of re-engineering;
5. seek validation of the methodology by consulting with academics and practitioners;
6. incorporate any comments and improvements in the methodology;
7. organise a workshop to disseminate the findings and to seek feedback.

3.3 Getting Philosophical

Whilst at the outset the method set out in Section 3.2 would appear to be a practical and logical approach to the tackling the research questions, it was thought prudent to examine the literature on management research to check

that the suggested approach was acceptable. This initial review suggested that before considering research methods, the researcher should consider more philosophical issues.

Initial investigation of the literature suggested that there are two main schools of though, or paradigms as they are often called. It is often suggested that the two main paradigms, the positivist paradigm and the phenomenological paradigm lie at two extremes of a continuum. Here we shall explore the two extremes, and discuss the middle ground.

Firstly, what do we mean by the term "paradigm" ? Burrell & Morgan (1979) observes that the term paradigm can be used at a philosophical level, where it is used to reflect basic beliefs about the world; or at the social level, where it is used to provide guidelines about how the researcher should conduct his research at the technical level, i.e. specifying the methods and techniques which ideally should be adopted when conducting research.

A criticism that could be levied at much of the management research literature is that there is a tendency to focus on issues of method, at the expense of the philosophical concerns (see for example Gill and Johnson 1991, Yin 1993, and to a lesser extent Gummesson 1991). Burrell and Morgan's (1979) seminal work remains influential partly because it links philosophical issues (or metatheoretical issues as they call them) with methodological issues in organisational analysis. So let us not fall into the trap that so many researchers fall into, and instead let us start by considering the philosophical level. At the most basic level, the positivist school of thought stems from their view of reality as being a concrete, supra-structural facility existing independently of, and determining human behaviour. The positivists would therefore argue that the nature of the world can only be understood by identifying universal, causal laws or law-like regularities. At the other end of the spectrum, the phenomenologists have a

less structured view of things. To them, reality is a projection of human thought and imagination. The world then is a product of human agency. Thus the phenonenologists believe that the nature of the world and the process of its construction can only be understood by "getting inside" people's heads.

So, the way that we view the world at a philosophical level has bearing on the research questions that interest us, and in return points us towards different research methods. The positivists identify with the empiricists who view research as a process of constructing precise and economical theories validated by well designed tests, using large and unbiased samples. Replicability and critical evaluation of method and results are the hallmark of this type of research. The phenomenologists, in believing that the world is the product of human agency, lean much more towards understanding the actions and thought of man.

Table 3.1 summarises the assumptions of the two paradigms.

	POSITIVISM	PHENOMENONISM
ONTOLOGY	reality is a supra-structural facility, existing independently of, and determining human behaviour	reality is a projection of human thought and imagination. the world is a product of human agency
EPISTEMOLOGY	the nature of the world can only be understood by identifying universal, causal laws or law-like regularities	the nature of the world and the process of its construction can only be understood by 'getting inside' peoples' heads
RESEARCH QUESTIONS	e.g. what patterns exist in the world ? what causal relationships can be identified ?	e.g. how do people construct the world?
METHODS	quantitative deductive surveys lab experiments	qualitative inductive case study ethnographic

Table 3.1: Comparison of the Positivist and Phenomenologist Viewpoints

This researcher, like many management researchers has an orientation towards the phenomenological paradigm, choosing to believe that people construct their own reality. This pushes the researcher to ask questions about what people do and think, and leans towards qualitative research methods.

3.4 Research Questions & Research Design

In considering research design, the first question the researcher must ask is what is the nature of the research ? It may be that the researcher is wanting to test out an idea drawn from existing theory and examine its impact in practice. This is theory driven research. Or, it may be that the researcher wants to investigate what is going on and then try to make sense of it by looking at patterns and drawing out themes. This is data-driven research. In research terms the theory-driven approach is called the deductive approach, while the data-driven approach is referred to as the inductive approach.

Since this particular thesis is concerned with investigating how UK universities are managing change, and their use of BPR then it leans more towards the inductive approach, where data is collected and analysed to draw out patterns. In this case we are attempting to learn from people's experience to construct an appropriate methodology for BPR in UK universities.

3.5 Research Methods

The next question the researcher has to ask is what type of data does he want to gather, and how best to gather this data.

In considering what type of data to collect, a number of authors (Yin 1984, Kotter 1988, Kinnear & Taylor 1991) have suggested that data sought through research efforts can be categorised under three headings: exploratory; descriptive; and causal/explanatory.

3.5.1 Exploratory Research

Exploratory research seeks to gather preliminary data to shed light on the nature of the problem, highlight issues for further investigation and possibly suggest hypothesis or new ideas (Kotter 1988). Exploratory research is appropriate where the research objectives include:

- developing a more precise formulation of a vaguely identified problem or opportunity

- gaining a perspective regarding the breadth of variables operating in a situation

- establishing priorities regarding the potential significance of various problems or opportunities

- gaining management and researcher perspective concerning the character of the problem situation

- identifying and formulating alternative courses of action

Kinnear & Taylor (1991) suggest observation, interviews with experts, group interviews with knowledgeable persons and experimentation as appropriate data collection tools.

3.5.2 Descriptive Research

Descriptive research is appropriate when research objectives include:

- portraying the characteristics of phenomenon and determining the frequency of occurrence

- determining the degree to which variables are associated with phenomenon

Kinnear & Taylor (1991) suggest utilising secondary data and interrogation of respondents as sources of data.

3.5.3 Explanatory Research

Explanatory research is appropriate when the research objectives include:

- understanding cause and effect relationships, the focus being on why things happen

- understanding the functional relationships between causal factors and the effect to be predicted

Kinnear & Taylor (1991) suggest that experiments and surveys are rich sources of data for explanatory research.

Thus it can be seen from the research objectives stated earlier in this chapter, the data sought in this study are at once exploratory and descriptive in nature. A methodology must therefore be developed which is appropriate to the capture of both exploratory and descriptive data. A combination of both quantitative and qualitative research approaches was therefore considered appropriate.

The terms quantitative and qualitative refer to research methods and how data are collected and analysed, and the type of generalisations derived from the data. Quantitative research presents statistical results represented with numbers. With quantitative research, the researcher is independent of what is being researched and the emphasis is on accuracy and precision. With this type of research, the researcher should aim to gather data from many investigation units, thus ensuring that results are statistically viable. Quantitative methods go for width rather than depth of data. Qualitative research on the other hand can capture depth of information. Here the researcher aims to capture the richness and complexity of behaviour that occurs in natural settings, from the participant's perspective. Creswell (1994) summarises the differences between the quantitative and qualitative approaches. Table 3.2 presents this in tabular form.

ASSUMPTION	QUESTION	QUANTITATIVE	QUALITATIVE
Ontological	what is the nature of reality?	Reality is objective and singular	Reality is subjective and multiple
Epistemological	what is the relationship of the researcher to the research?	Researcher is independent from the research area	Researcher interacts with the research area
Axiological	What is the role of values?	Value free and unbiased	Value laden and biased
Rhetorical	What is the language of research ?	Formal. Based on a set of definitions.	Informal and evolving.
Methodological	What is the process of research ?	Deductive Cause & effect Static design Categories identified before research study Context free Generalisations leading to prediction, explanation and understanding. Accurate and reliable through validity and reliability.	Inductive Shaping of simultaneous factors Emerging design Categories identified during the research process Context bound patterns Theories developed for understanding Accurate and reliable through verification.

Table 3.2:Comparison of Quantitative and Qualitative Research. Source: Creswell (1994)

3.6 Detailed Methodology

At the beginning of this chapter the author put forward a number of research questions and an outline approach. Now, let us return to this, bearing in mind our new-found knowledge of research design and research methods.

Research questions 1 & 2 , namely:

1. *to explore the competitive environment surrounding universities and to assess the need for organisational change in UK universities.*

2. *to investigate the management philosophies, models and tools which have helped turn around manufacturing and service organisations.*

both require exploratory and descriptive data, which in this case was collected mainly from secondary sources. Thorough reviews of the literature on both universities and business process re-engineering were undertaken in an attempt to address these questions.

Question one has already been considered in Chapter Two, and we have established a case for change in UK universities. In order to address question two, a thorough review of both the academic and practitioner literature on business process re-engineering was called for. Although the researcher had a background knowledge of the subject area (and indeed a reasonably substantial library of BPR papers, articles and books), in order to ensure a rigorous approach, the literature review started with various on-line searches of BIDS for business process re-engineering (and related key words). The Directory of International Conference Papers was also consulted. The World Wide Web was scanned regularly to ensure that the researcher had access to the latest information.

In addition to carrying out desk research, the researcher was also in the fortunate position of being able to attend workshops, conferences and seminars on the topic of business process re-engineering. These included those organised by the Business Process Re-engineering Centre at Warwick University, thus allowing the researcher to talk first hand with both academics and practitioners alike.

The third research question, namely,

3. *to explore the possibility of effectively transposing these philosophies, models and tools,*

required critical and analytical thinking on the part of the researcher. At this point further research questions were formulated and expert opinion was sought.

The fourth research question,

4. *to investigate the extent of BPR activity currently underway in UK universities,*

requiring exploratory research, lends itself to quantitative research techniques as a numerical answer is sought and breadth, rather than depth of information is sought.

Through attending conferences and speaking to other academics and administrative staff, the researcher was aware that a number of universities were involved in BPR initiatives. In order to quantify just how many universities in the UK were involved in BPR projects (or were considering

going down this route in the near future), it was decided to use a postal questionnaire. The reasons for choosing a postal questionnaire included:

- the ability to collect data from a geographically spread population
- with a population of only 90, a postal survey could be done inexpensively
- standardisation of data
- amenable to statistical analysis
- the ability to gather initial data quickly
- low cost

The next issue the researcher had to tackle was who to target the questionnaire at within the universities. Obviously an individual's remit within the university would affect the level of knowledge and involvement they would have in any change initiative. It was therefore decided that initial contact should be made with Chief Officers (mainly Principals, Vice Chancellors and University Secretaries). It was thought that these people would have the best overall view of any strategic change initiatives - although it was recognised that Chief Officers may not have operational involvement, they would almost certainly have some strategic input to any major change initiative.

The primary purpose of the questionnaire was to establish which universities were involved in BPR type re-organisation, and to point the way towards institutions that could provide further case material. Therefore the questionnaire was kept short and simple. In designing the questionnaire a

number of texts on research methods and questionnaire design were consulted (for example Brain 1996).

An up to date list of Chief Officers was found on the Internet and the questionnaire was sent out along with a covering letter. A copy of the questionnaire and covering letter are included in Appendix A. Chapter 5 reports on the findings of the postal survey.

Research question number 5,

5. to take a closer look at a number of these initiatives and note best practice,

is clearly a description question and one which requires qualitative data, providing depth of information. For these reasons it was decided to undertake in-depth personal interviews with people closely involved in BPR initiatives in UK universities.

Questionnaires sent out in the previous phase of the research programme contained a question asking if the respondent would like further information on the research project. This provided the researcher with a "foot in the door" so to speak for further interviews.

Whilst this approach gave rich information, the practical drawbacks of taking this approach included:

- the length of time required to undertake such in-depth investigations with numerous institutions

- the skill required to carry out such interviews

- the relatively high cost of data collection, given travelling expenses and time

- the subjective nature of the information gathered and also the subjective nature of the analysis

- data gathered can be copious and ensuing analysis lengthy

- such 'soft' data can come under attack as lacking both reliability and validity (Gordon & Langmaid 1988)

However, even given these drawbacks, personal interviews were still viewed as the best way of gathering the information required. Chapter six reports on this qualitative research.

In pulling together all that has gone before, the sixth research question,

6. *to construct and test a methodology for organisational change in universities*

requires using creative and critical thinking to use the data collected to construct a methodology for change. Whilst it would have been nice to test out the methodology on a number of institutions, it was recognised that the time factor involved precluded the testing of the methodology in the manner the researcher would have liked. The researcher, however, made every attempt to validate the methodology by seeking feedback from practitioners. Chapter 8 discusses this in detail.

The final research question,

7. to analyse and discuss the value of the methodology

is an attempt to combat criticisms that could be levied that the methodology is subjective and untested. To this end a national workshop was organised and hosted by the researcher in an attempt to promote discussion, gather feedback and validate the work.

3.7 In Defence of My Research Design

Before leaving the research design, it should be noted that a researcher must be prepared to address criticism of his/her research and to defend his/her thesis. It is always better to think about potential criticisms in advance of carrying out the research. In doing so, the researcher has to look objectively at his own research plan. It is for these reasons that this researcher has chosen to look at the issues of validity and reliability which are considered important in judging the quality of research design (Nachmias and Nachmias 1976, Yin 1984, Easterby-Smith 1991, Kinear and Taylor 1991).

There are a number of issues of validity, namely: construct validity; content validity; internal validity and external validity. Construct validity relates to establishing the correct operational measures for the concepts being studied. This has been established in Section 3.5. There are two issues relating to content validity: firstly there is face validity which rests on the researchers subjective evaluation as to the measuring instrument. The second issue, of sampling validity relates to whether or not a given population is adequately sampled by the measuring instrument. In this case the population refers to UK universities which currently number 90 (without

splitting the Universities of London and Wales into constituent parts). The researcher was therefore able to target all 90 universities with the quantitative research instrument, the postal questionnaire. Great thought in designing the questionnaire, targeting respondents personally and providing reply envelopes, all helped to achieve a response rate of 62%. Thus, the sampling validity should not come into question in this case.

Regarding the qualitative data collection, every attempt was made to gain access to all institutions who responded positively to the questionnaire. As would be expected, not all universities were able to spare the time to take part in the exercise, but a tenacious approach taken by the researcher in making appointments meant that ten of the 25 institutions reported to be undertaking BPR were visited.

Internal validity which is concerned with establishing a causal relationship whereby certain conditions are shown to lead to other conditions, as distinguished from spurious relationships is not considered to be an issue in this case. External validity, i.e. establishing the domain to which a study's findings can be generalised was covered by concluding the research project with a workshop to discuss the generalisation of the findings and soliciting feedback from those within the domain.

The question of reliability means demonstrating that the operations of a study, including data collection procedures and analysis procedures, can be repeated, with the same results. It is here that the quantitative study, with its clear analysis procedures has an advantage over the qualitative study, which has a greater degree of subjectivity involved.

In conclusion then, meticulous attention has been paid by the researcher at every stage of the research design to ensure validity and reliability can be defended.

3.8 A Final Word on Methodology

Kotter (1988) observes that "...effective.... research involves five steps: defining the problem and research objectives, developing the research plan, collecting the information, analysing the information and presenting the findings". Previous chapters have sought to address the first two issues. The remaining chapters will address the remainder.

CHAPTER 4

BUSINESS PROCESS RE- ENGINEERING

In addressing Research Question No. 2, this chapter starts by looking at some of the better known change management methodologies which have helped turn around manufacturing industry over the years. Coming up to date, the chapter then turns its attention to Business Process Re-engineering, one of the latest methodologies to promise radical change. We look first at the origins of Business Process Re-engineering (BPR) and ask: what exactly is meant by the term BPR? who is doing it ? how successful is it? The chapter then goes on to consider whether it is just another passing fad or whether we have actually witnessed a paradigm shift. The methodologies documented in the literature are examined and compared. Finally, we look for evidence in the literature of BPR activity within the public sector, and in particular within universities.

4.1 A Potted History of Change in Manufacturing Industries

One of the first documented management methodologies to bring about radical change in the manufacturing industry was Frederick Taylor's Scientific Management. At a time when the manufacturing environment was largely characterised by mass production: low variety, high volume, Taylor advocated a factory management system based on the division of labour. By separating the managers (the scientists/the thinkers) from the doers and by making individuals responsible for narrow tasks which they could become specialised at, mass production was speeded up. Workers were told exactly

what to do, and concentrated all their efforts on doing just that task. Whilst this philosophy has dominated manufacturing for nearly a century, critics (e.g. Hammer & Champy 1993) would argue that it has led to organisations with too many levels of management, and that this has resulted in management who are remote from manufacturing activities, and workers who are remote from the customers. In such an organisation, where large numbers of employees are not expected to "think", opportunities for change and improvement are diminished.

Since those early days following the industrial revolution, the environment surrounding the manufacturing industry has changed dramatically. Customers demand variety, quality and reliability. Product life cycles have shortened, competition has increased and the pace of technological change is ever increasing.

So, in order to adapt to the changing environment, manufacturing industry has had to look for new management methodologies. The late 1960s saw Group Technology reduce manufacturing complexity by classifying and grouping parts according to their attributes. Operations were thereby simplified, and this led to machines and people being organised into groups to produce families of products.

Competition from the East prompted radical changes in the 1970s. Countries in the Pacific region offered a low-cost manufacturing base. Japan was one of the first countries to introduce new management techniques which allowed Japanese industry to gain significant competitive advantage in manufacturing over Western companies.

Gradually, during the 1980s these new techniques, including manufacturing resource planning (MRP), just-in-time (JIT), computer integrated manufacturing (CIM) and various quality initiatives, culminating in Total

Quality Management (TQM), were adopted by Western manufacturing organisations. The 1980s also saw a belief by many that the way forward for manufacturing was in the development of computer applications for manufacturing. CNC machines, robots, CAD/CAM and expert systems were the flavour of the 80s. Automate or liquidate was the mantra for many Western companies.

The Japanese were also interested in robotics and automation, but their approach was a more human centred one. Many overseas missions to Japan were made in the late 80s, early 90s, resulting in the discovery of management practices by Taiichi Ohno at Toyota, now collectively called "Lean Manufacturing" (Womack et al 1990). Whilst to many, Lean Manufacturing promotes visions of downsizing and redundancies, in fact Lean Manufacturing is based on the just-in-time principle: parts are produced at each stage to supply the immediate demand of the next stage (Lo 1997). Thus lean manufacturing effectively removes all safety nets and thus concentrates the minds of every individual involved in production to anticipate problems before they become serious enough to stop production. Thus people are focused on quality, continuous improvement and waste reduction.

Having trimmed down, reduced waste and become lean manufacturing organisations, the next wave of change came from the realisation that in many industries flexibility was a key success factor. In the early 1990s academics (e.g. Puttick 1989, Hill 1993) argued that the key to success would be the ability to respond to change. The Agile Manufacturing Concept (Kidd 1994) calls for the transformation of organisations from rigid hierarchies to "virtual enterprises" built on the core competence of people, collaboration, integration and advanced technologies.

Around the same time, another management concept, that of Business Process Re-engineering (BPR) came to the attention of the manufacturing sector.

4.2 BPR - What is It ?

The term Business Process Re-engineering (BPR) was popularised by American management consultants in the early 1990s. Probably the most quoted definition of BPR is that offered by Hammer (1990),

"Business process reengineering is the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical, contemporary measures of performance, such as cost, quality, service and speed. "

BPR fever quickly spread, and along with it came a swelling in the volume of literature on the topic. In the early days there was significant confusion as to what BPR actually comprises. Carrie & MacIntosh (1994) note that "a quick perusal of these journals show a diversity of definitions of BPR, and even of the words which go together to give the three initials." Much of the early literature attempts to define concepts, under a variety of names including Business Process Redesign, Business Process Improvement, Process Innovation, etc.

However, as BPR continues to mature, there is general concurrence that BPR involves:

- focusing on processes rather than functions
- radical change
- focusing on activities that add value to the customer

- and eliminating/reducing those that don' t add value
- using IT as an enabler

For the purpose of this research, these five criteria will form the basis of our working definition of BPR. Reengineering is about focusing on business processes, eliminating activities that do not add value to the customer, and finding better ways of organising and doing work. Reengineering requires not just a change in the way people work, but also in a change in structure, systems and resources to support the redesigned processes.

According to Hammer (1990), reengineering involves certain principles for analysing and dramatically reorganising business as a system. The following are the six key principles:

1. Organise business processes around outcomes, not tasks;
2. Assign those who use the output to perform the process;
3. Integrate information processing into the work that produces the information;
4. Create a virtual enterprise by treating geographically distributed resources as though they were centralised;
5. Link parallel activities instead of integrating their results;
6. Have the people who do the work make all the decisions, and let controls built into the system monitor the process.

resources and it is then up to the organisation to decide how to employ these free resources.

BPR is not Automation

Whilst technology has a part to play in BPR, technology itself does not provide the solution - rather technology should be viewed as an enabler to support redesign.

4.4 Adopting a Process View

BPR requires organisations to think in terms of business processes rather than business units or functions. Adopting a process view of an organisation, means a great change in perspective, from a vertical view to a horizontal view. We are used to looking at organisations in terms of their structure: what departments are there? who reports to who? what is the hierarchy? etc. i.e. taking a vertical view of the organisation.

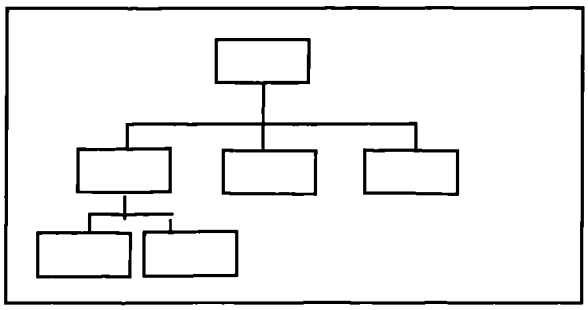

Fig 4.1 : Traditional Functional (or vertical) View of an Organisation

When we consider processes we are looking at the organisation from a horizontal perspective. The organisation is viewed as a system of cross-functional processes which cut through the organisation and whose final result provide the organisation with its profit.

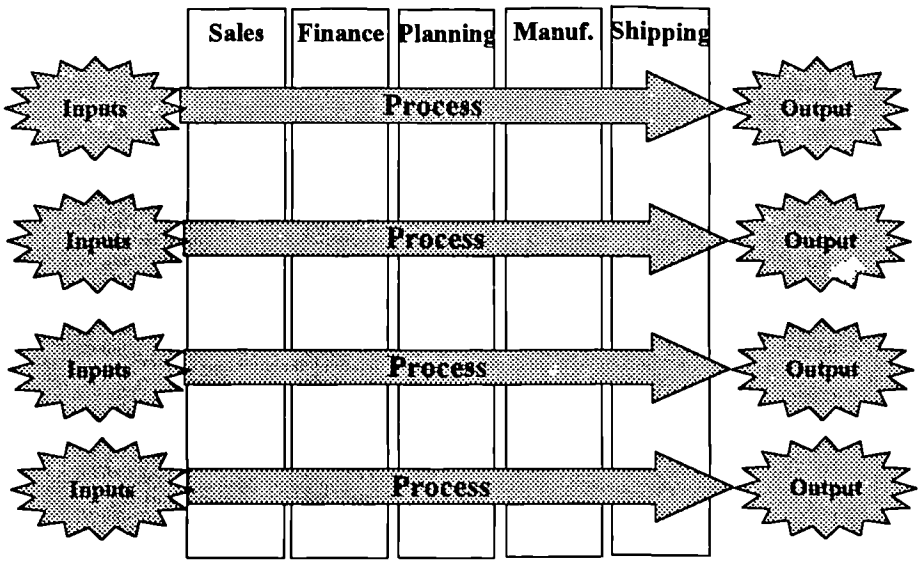

Fig 4.2 : A Process View of an Organisation

4.5 What Is a Business Process

Davenport & Short (1990) defined a business process as "the logical organisation of people, materials, energy, equipment and procedures into work activities designed to produce a specified end result". Further, they stated that processes have two important characteristics: firstly they have customers, and secondly they cross organisational boundaries and are generally independent of formal organisational structure.

Davenport (1993) links the concept of a business process with the concept of the value chain (Porter 1985). Porter said that value activities are those physically and technically distinct activities which a firm performs that creates a product valuable to its customers. Furthermore Porter emphasises the importance of linkages between the activities. Both concepts can be seen to be defined using a similar set of principles, both having an external customer focus and the integration of activities and flows to meet a purpose.

Childe et al (1995) believe that the concept of a business process can be grounded in the discipline of systems (see for example Checkland 1981). Childe et al (1995) define a business process as "a system comprising a set of integrated activities and flows that as a whole produces outputs that fulfil a purpose with respect to an external customer". This researcher would concur with this definition but would not use the word "external" - outputs can fulfil a purpose for internal customers too.

4.6 Where Did the Business Processes Paradigm come from ?

Schumacher (1997) contends that Business Process Orientation is a new paradigm for the organisation of a business. The basic idea is to have everyone in the organisation focusing on serving the customer in an efficient and effective manner, the customer being on the receiving end of the business processes. Thus people within the organisation are no longer focusing upward into a management hierarchy, but rather looking forward to the customers. As Schumacher (1997) puts it "instead of the traditional inward-bound functional orientation which divides the company into functions like sales, production, purchasing, and product development, process orientation organises companies around their processes".

Coombs and Hull (1995) also point to the emergence of a business process paradigm, a heterogeneous collection of theories, concepts, practices for analysing organisations, and practices for managing organisations. They note that whilst as yet these are heterogeneous, they share a common view of a fundamental change in managing and thinking about organisations. They are distinguished from previous forms of management and analysis in that the focus is no longer on optimising specialist functions within the organisation - such as finance, manufacturing, or marketing.

Kay (1993) notes that one of the significant changes in strategic management thinking over the last fifteen years has been the perceived linkage between strategy and organisational structure. For years the dominant model was that put forward by Chandler (1962) and Ansoff (1965) whereby a company assessed its environment, formulated strategies, and implemented the strategies, adapting the organisational structure accordingly. It is interesting to note that this model was popularised by Porter (1980) when he put forward his notion of the five "competitive forces" - competition, entry, substitution, suppliers and customers - as a checklist for identifying opportunities and formulating strategies. However, by 1985, Porter was advocating looking within the organisation for strategic opportunities. This led him to propose the concept of the "value chain" which Coombs and Hull (1995) identify as being one of the crucial underpinnings of the Business Process paradigm.

Earlier Mintzberg (1972) suggested that strategy was "emergent" from the structure or behaviour of the organisation. Pettigrew (1977), Child (1974,75) and Miles and Snow (1978) further developed the idea of interactions between strategy, structure and process.

The actual birth of BPR is said to have stemmed from the work carried out within the Management in the 1990s programme at the Massachusetts Institute of Technology (MIT) and the Sloan School of Management. It was here that the concept of "business process" first arose (see Venkatraman 1991) as an adaptation of Porter's value chain model. As Coombs and Hull put it, this model "privileges the horizontal" by modelling the sequence of activities conducted by an organisation which add value to a particular product or service as it progresses from its initial stages towards final delivery.

A second contributing point to the business process paradigm is the focus on the potential of IT and its ability to increase communication across functions, thus enabling employees to gain greater awareness of the organisation, and indeed their role within it.

Focus on the customer is another "trend" which contributes to the business process paradigm. The marketing concept advocated in the 1980s was further extended by TQM and JIT. For example Hill (1993) and Fuller and Smith (1991) both argue that TQM and JIT demand that production/service units regard themselves as suppliers to other internal customers. This leads Coombs and Hull (1995) onto their forth reference point for the business process paradigm - that of supply chain management (SMC) which the DTI (1991) define as "getting a smooth and efficient flow from raw material to finished goods in your customers hands". SMC derives partly from logistics and operations management and partly from techniques emanating from Japan.

The fifth contributor is the recent focus on new product development, and in particular, shortening time to market. Concurrent engineering, cross-functional teams and project management structures all have a horizontal focus.

Finally Coombs and Hull (1995) point to the recent focus on partnerships and networks (e.g. Johnstone and Lawrence 1988, Leverick and Littler 1995) as a contributor to the business process paradigm. They highlight that once again the traditional understanding of the organisation as a self-enclosed, functionally bureaucratic and hierarchical entity is being challenged by observations of the different, non-functional, non-market based relationships developing between organisations.

Further evidence of a BP paradigm comes from the Sociology /Psychology/ Human Resource Management literature. For example, Kanter (1990) argues that the rigid roles and relationships enforced by bureaucratic structures are "emotionally repressive" and impersonal. Further, she argues for the "post-entrepreneurial corporation... with its stress on teamwork and co-operation, with its encouragement and imagination and commitment to the process of building the new". Senge (1990) and Handy (1994) also describe similar organisations where learning and creativity are encouraged and bureaucracy is criticised for stifling them.

In summarising, Coombs & Hull (1995) argue that we are witnessing a paradigm shift, and the main reference points for the BP paradigm include:

- competitiveness
- entrepreneurship
- value-chains
- informating
- customer-driven
- supply chains
- product development
- partnerships and networks
- co-operation
- knowledge/learning-based

4.7 Why adopt a process view ?

Garvin (1995) points to a number of reasons why companies should adopt a process view, including:

- it encourages a customer focus
- it addresses the speed to market of new products and processes
- it allows increasing flexibility needed to meet changing external demands
- it facilitates increased delivery reliability
- it facilitates cost reduction
- it helps address quality issues

It is not only companies embarking on a programme of Business Process Re-engineering (BPR) that need to look at their processes, any company concerned with Total Quality Management (TQM) will have to have a clear understanding of their business processes. The Malcolm Baldridge National Quality Award and the European Foundation for Quality Management (EFQM) model, on which the European Quality Award is based, both require the identification of processes and the management of these processes.

Porter (1985) identifies two types of activities - "primary activities" which add value and "support activities" which enable the primary activities to function. Childe et al (1995) suggest a further set of activities, "management activities" which include direction setting, enabling change and managing performance activities. The CIM-OSA standard (AMICE ESPRIT 1989) also groups processes into "Manage, Operate and Support". Further evidence comes from Lucas who have "Development, Delivery Operations and Support Processes and The Royal Mail who have "External Customer, Support and

Management" processes. Schumacher (1997) concurs with this and divides business processes into external customer facing processes, that deliver products and services of value, management, and support processes. Management processes control and co-ordinate these operate and support processes and ensure that business objectives are delivered. Support processes provide infrastructural and other assistance to business processes. Schumacher further differentiates business process into 'knowledge-based' and 'operational' processes. He classes new product development, research activities, advertising and management consulting as knowledge based processes. These processes rely on the skills, knowledge and creativity of individuals and tend to be non-standard in nature. Schumacher observes that knowledge based processes are not common in BPR projects. Operational processes on the other hand are at the heart of most BPR efforts. Operational processes include manufacturing, purchasing and customer service. They tend to be more standardised, repeatable and stable.

From the literature it would appear that in approaching Business Process Re-engineering many top organisations have tended to initially address their operational processes, then move to focus on support processes, whilst continuing to improve their operational processes, and next to focus on direction setting processes whilst continuing to improve operational and support processes.

4.8 BPR - Radical or Incremental Change ?

Change can be characterised as being either of a radical or incremental nature (Kotter 1992). Typically BPR is associated with radical change, as Hammer (1990) asserts - "at the heart of re-engineering, is the notion of discontinuous thinking - of recognising and breaking away from the outdated rules and fundamental assumptions that underlie operation. Unless we

change these rules, we are merely rearranging the deck chairs on the Titanic". Belmonte and Murray (1993) suggest that BPR is radical and that incremental change will not suffice. Kaplan and Murdock (1991) agree that organisations need to undertake radical change when implementing process change. This researcher would agree that BPR is much more radical than a mere tampering with processes - but how do we define "radical" ?

Heygate (1993) builds a framework to locate different BPR projects based on how "radical" each is. The framework has two dimensions: scope and performance yield. Here scope is determined by the number of BPR initiatives - and performance yield ranges from 'quick hits' to becoming a 'world class organisation'. There are however a number of criticisms that could be levelled at Heygate's model, not least that he confuses radical with risk. An alternative framework is presented by Childe et al (1996) who identified two distinct types of "BPR" in the manufacturing and service companies they studied. They suggest that companies either follow a process improvement path or a process re-engineering path. Process improvers they found were incrementalists and their programmes were long term initiatives of the total quality, continuous improvement variety. In contrast, process re-engineers had targeted relatively radical short term changes, more closely conforming to the Hammer and Champy 'blue sky', 'green field', 'clean sheet of paper' approach. Incremental approaches, said Childe et al (1996), leave the basic process in place and make gradual, small improvements to correct problems, remove non-value-added activities, reduce costs, etc. These companies tended to leave the process unchanged.

The framework favoured by this researcher is that put forward by Dale (1994). Dale outlines what he sees as being different levels of BPR initiatives. This is shown in Figure 4.4. However, the researchers own view, based on the criteria set down in Section 4.2, is that the first two stages in

Dale's framework (namely process improvement and automation) should not be classed as BPR.

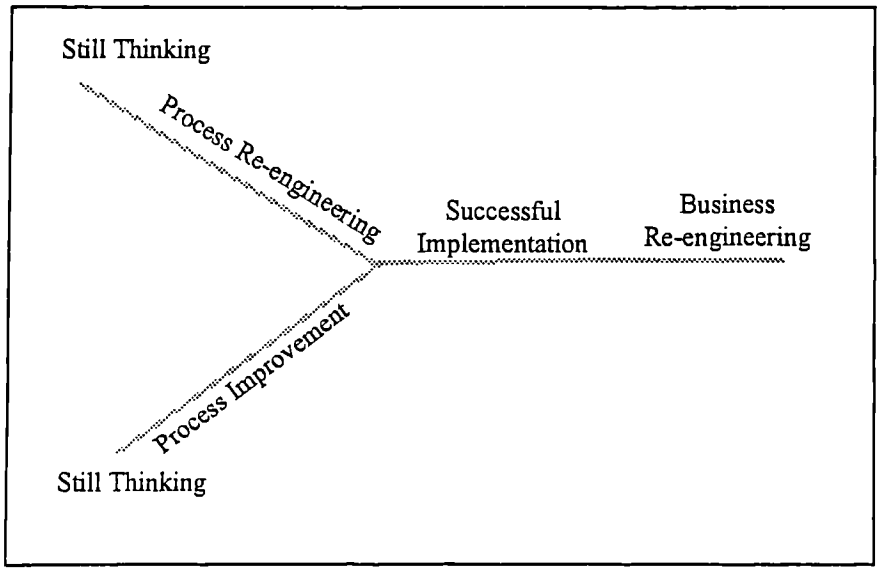

Figure 4.3 Routes to BPR
Source: Maul, Childe and Mills (1996)

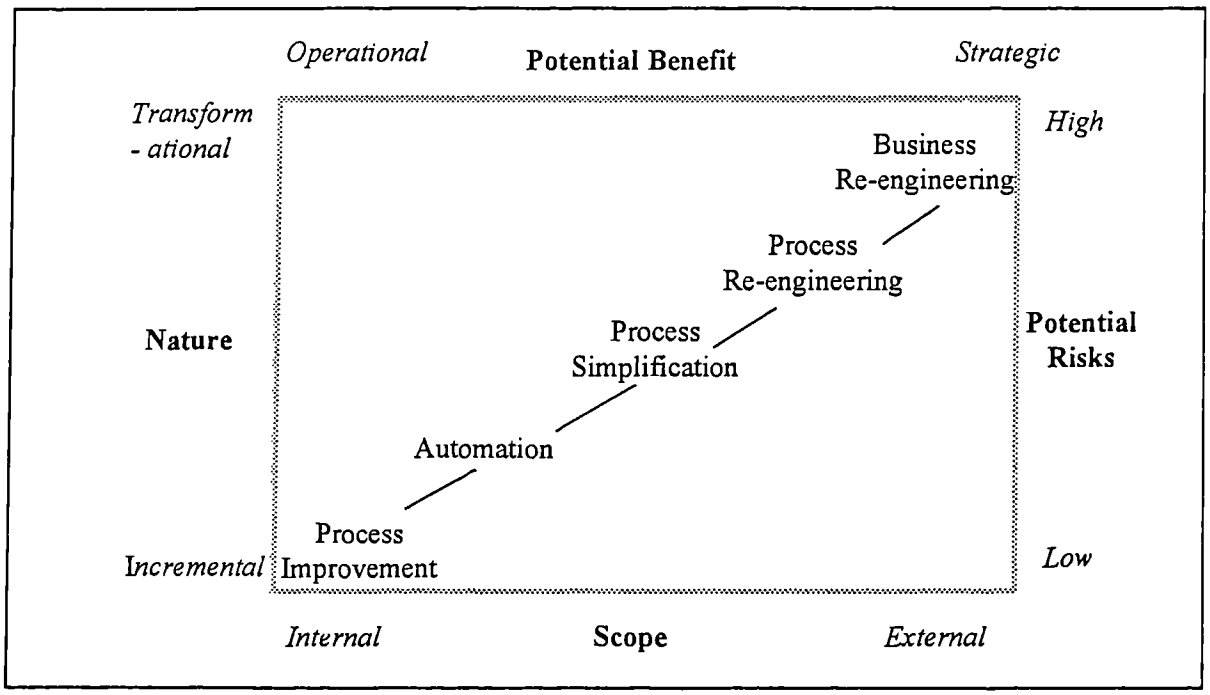

Figure 4.4 : Levels of BPR
Source: Dale (1994)

4.9 BPR - Who's doing It ?

MacIntosh and Francis (1996) report that a number of surveys have been conducted in the UK to assess the level of interest in BPR. Business Intelligence (Harvey 1994) reported that 77% of their respondents were engaged in a re-engineering programme, with a further 13% planning to launch a project. Another survey by Highman Systems Group found that 65% of respondents were involved in, or considering BPR (Skinner and Pearson 1993). Woudhuysen (1993) claimed that BPR was in full sway in 21 of Britain's Times 100 companies. MacIntosh and Francis conclude that whilst the results of individual surveys may differ, there seems to be little doubt that a significant number of UK companies, from a broad cross-section of industries, have taken a serious interest in BPR.

4.10 Why Are People Doing It ?

According to Braganza and Myers (1996) the key reason why organisations undertake a BPR initiative is because it is a valuable addition to an organisations' business strategy in the face of increasing change and competition in the 1990s. Thus, they view BPR as a way of gaining competitive advantage.

This researcher would have to argue that whilst BPR is an important strategic weapon, it is at an operational level that tangible benefits can be seen most readily and quickly. BPR allows companies to design work in a manner that is efficient and effective and that minimises waste - and ultimately reduces cost.

4.11 What Is the Success Rate ?

The article "Has Re-engineering Had its 15 Minutes of Fame?" which appeared in Management Today in Feb 1995 (p8) asked the question is BPR just a fad or is it more durable than other "universal remedies" such as Management By Objectives (MBO), Operational Research (OR) etc. The article quotes Dr Peter Johnson, Head of the Internal Consulting operation at Lucas Engineering and Systems who says that Lucas have seen 'productivity improvements in the order of 25-40% due to BPR'. However, according to this article, some 68% of the 350 managers who responded to an Arthur D Little survey on BPR confessed that their projects had developed unfortunate side-effects. The article does not, however, expand upon what side-effects have been witnessed. MacIntosh & Francis (1996) in looking at UK case studies found little or no evidence of failures. However they, also, refer to the USA CSC Index Survey of 600 firms having undertaken BPR. This survey claimed that as many as 67% of companies reported zero or marginal results.

4.12 Characteristics of Successful BPR ?

The Fourth Forum to be hosted by the ESRC Business Process Resource Centre at the University of Warwick, "Business Process Re-engineering: The Human issues", took place on 30 April 1996. One of the main discussions during this forum concerned identifying factors that contribute to the success or failure of BPR projects. Tables 4.1 and 4.2 synthesise the most commonly quoted "good" and "bad" practices.

Strategic Management

- sustained high priority to human and organisational issues, including effective HRM and training policies to support the planned changes and ameliorate the "pain of change"
- targeting of dramatic improvements as well as relentlessly pursuing ongoing incremental change and improvement plans, including the setting and monitoring of performance measures in all key activities
- promotion of open communication with all stakeholders
- sustained commitment and leadership from top management as the values of senior managers are critical in leading changes of this kind
- quick completion of projects, while acknowledging the need to go slow at times, in order to go faster in the long term

Process Design and Implementation

- best people chosen for design teams, with sufficient time away from everyday responsibilities to think creatively about improving processes
- widespread participation from all stakeholders (employees and customers)
- focus on improving key business processes, not mending relatively unimportant processes that don't work well
- strong customer orientation
- systematic and closely monitored TQM and continuous improvement approaches to sustain change
- effective learning from earlier problems

Targeted Outcomes

- greater staff empowerment and local autonomy
- delivery of proof at local level that new processes produce tangible benefits
- open and regular communication inside the organisation and externally
- encouragement of multi-skilled team work
- simple systems, smart people

Table 4.1: Key Characteristics of Successful BPR Strategies

Management

- inadequate understanding of, and insufficient attention to, human issues
- resistance or loss of commitment from many managers, including at Board level
- strength of prevailing culture and political structures within which vested interests may be very powerful
- pursuing a restructuring or downsizing strategy rather than a re-engineering approach
- not following through the initial changes
- lack of time to plan for the future

Implementation

- the best people not seconded to the BPR design team
- difficulty of moving to process-oriented thinking and analysis
- re-engineering the wrong processes, without sufficient process improvement
- inadequate attention to providing appropriate new IT-based business systems
- skills and resource shortages
- problems with redesign methods and approaches

Table 4.2 Reasons for BPR Failures

4.13 BPR Methodologies

With the spread of BPR we have also witnessed a growth in the number of methodologies being offered up. Indeed there are so many methodologies that it is not possible to discuss, evaluate or even list them all. However, in an attempt to discuss and compare different approaches, this section reviews a number of contemporary approaches - fourteen methodologies representing a mix of academic, consultant and practitioner models, are

discussed below. Table 4.3 shows in table form fifteen different methodologies and their high-level approaches.

	Methodology	Approach
1	Originator: Coopers & Lybrand Name: BreakPoint BPR Source: NACUBO (1994)	1. Discover 2. Redesign 3. Realise
2	Originator: Deloitte & Touche Name: Engineering for Results Source: Deloitte & Touch Homepage	1. Establish Change Imperative 2. Create Vision & Targets 3. Redesign 4. Build & Implement
3	Originator: Anderson Consulting Name: Value Driven Re-engineering Source: Anderson Consulting Homepage	1. Shared Vision 2. Assess, Align 3. Masterplan 4. Design, Pilot, Implement
4	Originator: Booze-Allen & Hamilton Name: Value Engineering Source:Booze-Allen & Hamilton Homepage	1. Figure out where to focus 2. Determine what to do and identify sponsors 3. Create an implementation plan and appoint team members to carry out 4. Execute plan and make it part of your core business
5	Originator : Bain & Co. Name: N/A Source: Bain & Co. Homepage	1. Macro Audit 2. Diagnosis/Analysis 3. Option Development 4. Pilots proofs and concept 5. Full implementation
6	Originator: McKinsey & Company Name: Radical Redesign Source: McKinsey & Company Homepage	1. Lay the groundwork 2. Diagnose current performance 3. Redesign 4. Get ready for change 5. Implement
7	Originator: Price Waterhouse Name: Change Integration Source: Price Waterhouse Homepage	1. Evaluate 2. Envision 3. Empower 4. Excel
8	Originator: KPMG Peat Marwick Name: SMART Methodology Source: KPMG Homepage	1. Business Direction 2. Scoping & Targeting 3. Process Redesign 4. Mobilisation 5. Implementation

Table 4.3 : A Selection of BPR Methodologies Found in the Literature

9	Originator: Hammer & Company Name: Business Process Reengineering Source: Hammer & Champy (1993)	1. Mobilise 2. Diagnose 3. Redesign 4. Pilot 5. Transition 6. Implementation
10	Originator: Manganelli & Klein Name: Rapid-Re Source: Manganelli & Klein (1994)	1. Preparation 2. Identification 3. Vision 4. Solution: technical design/social design 5. Transformation
11	Originator: Davenport Name: Process Innovation Source: Davenport (1993)	1. Identify process for innovation 2. Identify change levers 3. Develop process vision 4. Understand existing processes 5. Design & Prototype the new process 6. Implementation
12	Originator: Centre for Strategic Process Innovation Name: ReVision Source: Centre for Strategic Process innovation Homepage	1. Initiate 2. Envision 3. Analyse 4. Redesign 5. Blueprinting 6. Implement 7. Monitor
13	Originator: Rank Xerox (UK) Ltd. Name: N/A Source: Harvey (1994)	1. the initiation stage 2. Modelling 3. analysis 4. design 5. pilot 6. implementation 7. renewal or continuous improvement
14	Originator: Leicester Royal Infirmary Name: N/A Source: Newman (1994)	1. measure current performance 2. set new performance targets 3. map processes 4. redesign processes 5. implement 6. evaluate and monitor

Table 4.3 : A Selection of BPR Methodologies found in the literature

4.14 Comparison of BPR Methodologies

From Table 4.3 we can see that many re-engineering methodologies share common elements. Typically most methods:

- define the project before commencing
- have a redesign step or new idea step
- plan and implement a solution
- measure resulting performance changes

However, methodologies vary :

- Some methods encompass a stage where the "as-is" process is modelled prior to redesign (e.g. Manganelli & Klein's Rapid-Re, Davenport's Process Innovation). This approach does give people new to redesign something to start with. It can also be valuable in assisting in gap analysis. However, documenting current processes is often criticised because teams can get bogged down in documenting the as-is, delaying the re-engineering efforts, and often preventing the team from thinking creatively. Some methodologies therefore do not explicitly specify modelling of existing processes (e.g. Deloitte's Engineering for Results, KPMG's SMART).

- Some methods start by creating a vision before the start of the redesign work (e.g. CSPI's ReVision, Manganelli & Klein's Rapid-Re). It is generally thought that this is very important for long term success. Lack of vision or context can result in difficulty designing and implementing a solution - or indeed can result in a totally unsuitable redesign effort.

- Some methodologies specify the use of proprietary tools (e.g. Anderson's Value Driven Re-engineering, Deloitte's Engineering for Results), whilst others rely on existing management tools and techniques (e.g. Manganelli & Klein's Rapid-Re). Some do not specify tools at all (e.g. Hammer's BPR)

- Some methodologies place more emphasis on IT than others (e.g. Davenport's Process Innovation)

4.15 BPR Techniques and Tools

Whilst methodologies offer high-level steps, techniques are needed to accomplish these steps. A technique is a practical method applied to a particular task. Tools are implements to help in performing techniques. As we stated in Section 4.14, some methodologies specify specific techniques, and even offer up tools for carrying out these techniques. Other methodologies offer up a tool-kit and leave it to the practitioner to choose his own set of tools and techniques. As there are so many techniques and tools to choose from, we will not go into detail here, but instead leave this particular discussion until we develop our own methodology in Chapter 8.

4.16 BPR Applied to the Public Sector

Following stories of how BPR has helped turn around the fortunes of companies within the corporate world, the public sector has also bought into Business Process Re-engineering. The USA are quite far down the line, with re-engineering being championed at Vice President Level. To support Vice President Al Gore in creating a Government that "works better and costs less", the US Department of the Interior has established a number of Reinvention Laboratories to look at re-engineering Government departments.

Closer to home, the CCTA, the Government Centre for Information Systems published a guide to "BPR in the Public Sector" in 1994. This provided an overview of BPR and pointed to examples within the UK Public Sector. Inherent was the suggestion that public sector organisations consider BPR as a response to initiatives such as the New Public Management Initiative, the Citizen's Charter, Market Testing and Compulsory Competitive Tendering. The aim being to achieve public sector organisations that are customer focused, run at an acceptable cost, and that aim to ensure activities add value for the customer.

In the UK public sector, probably the most documented BPR initiatives have been within the Health Service. Clarke & Poulter (1997) consider BPR in the context of the management of change in the NHS. In their 1997 publication they present three case studies, and offer guidance on planning and implementation of BPR initiatives within the Health Service. One example that particularly appeals to this researcher is that put forward by Parfett (1994) when he points to the example of a BPR initiative within an NHS trust hospital which found that the process of changing a light bulb involved six different people and seventeen different steps. In addition to the lengthy elapsed time, each of the steps had a 20 minute overhead! Whilst this example is perhaps exaggerated, it does provide us with an idea of the types of wastage that can be eliminated.

Other examples in the literature include that of a Next Steps Agency involved in a five year programme to re-engineer its core processes (CCTA 1994). This initiative was driven by the need to replace its core information systems. Another example given by the CCTA is that of the payroll service of a central government department applying BPR across their activities in an attempt to reduce costs and deliver a value-for-money service in the face of a competitive tendering situation.

4.17 BPR Applied to Universities

In 1994 "Industry and Higher Education" published a paper by Richard Mahoney which initiated this researchers interest in studying the application of BPR to UK Universities. Mahoney (1994), whilst acknowledging that universities have significant differences to profit making companies, set out his view that universities could learn many lessons from corporate business' experience of business redesign techniques. Indeed it would appear that many universities and colleges in the USA have taken his advice, with evidence of BPR initiatives at MIT, UCLA, Stanford University School of Medicine and many others. The National Association of College and University Business Officers (NACUBO) published a book in conjunction with Coopers & Lybrand in 1994 entitled "Business Process Re-design for Higher Education" which outlines a number of US cases of BPR in the Higher Education Sector. It is the researcher's opinion that this book has a number of weaknesses, including:

1. it assumes that it will be "senior administration members" that "launch" BPR in universities;

2. it is heavily biased towards administrative processes;

3. it assumes the university to be a "corporate" organisation, with professional managers;

4. being American it assumes that everyone within the organisation is customer focused;

5. it advocates an adaptation of the Coopers & Lybrand Breakpoint BPR methodology which follows the high-level steps: Discover, Redesign and Realize. The researcher has two main problems with this methodology employed in the university context. Firstly, the Discover step involves setting a vision, and organising for change - this researcher thinks that

this is premature without having carried out an analysis of requirements. Secondly, the Redesign step is portrayed as following naturally from the Discover step. In UK universities, almost certainly, there would be more planning and approval required before proceeding.

In conclusion, this in an interesting text, and the only one focusing on BPR in the university sector. However, it is the researcher's opinion that it has a number of weaknesses and that it is not a suitable methodology for the UK context.

It was not until 1995 that this researcher saw any evidence of BPR in UK universities. Mike Boxall of Touche Ross Management Consultants presented a paper entitled "Rethinking Universities - Process Models of Higher Education" at the Society for Research into Higher Education (SRHE) conference in Edinburgh in December 1995. Whilst this paper was perhaps naive in its interpretation of the higher education environment and met with a mixed response, it did introduce many in the audience to the concept of business processes and it further awakened this researcher's interest in investigating BPR in UK universities further. To date there is no other evidence in the literature of BPR activity in UK universities. This research aims to contribute to current knowledge by documenting BPR activity in UK universities and by developing a more appropriate methodology for the UK context.

4.18 Chapter Conclusion

This chapter has reviewed the literature on business process re-engineering and demonstrated the benefits many organisations have found in taking a process view of their organisations. We have advanced the thesis by showing the benefits of BPR and a process viewpoint. We have also looked for evidence in the literature of BPR being applied to universities. We have

found existing BPR methodologies created for the American university sector (See section 4.17) distinctly lacking.

The next two chapters will now look for empirical evidence of BPR being applied to UK universities and seek further evidence to support the hypothesis that existing BPR methodologies are inappropriate for the UK university context; and at the same time gather information that will help us to develop a more suitable approach.

CHAPTER 5

THE EXTENT OF BPR IN UK UNIVERSITIES:

RESULTS OF THE POSTAL SURVEY

Having addressed Research Questions 1 and 2 and having partially addressed Research Question 3 (which will be subject to an ongoing discussion throughout the thesis), this chapter sets out to investigate and report on the extent of BPR activity currently underway in UK universities (i.e. Research Question 4). The chapter starts by discussing the research instrument used to gather the information necessary to answer this research question. The resulting data is reported and analysed. The chapter concludes by discussing the actual extent of BPR activity in UK universities.

5.1 Questionnaire Design

In Chapter 3 the research method most appropriate to investigate the extent of BPR activity in UK universities was discussed. We noted that it was breath rather than depth of information we were looking for at this stage and it was decided that quantitative methods were called for. The use of a postal questionnaire was agreed, mainly for reasons of coverage, cost and speed.

Having determined the most appropriate format to carry out the research, the next phase in the study was to design the actual questionnaire itself. In this section we will look at some of the key issues when designing a postal questionnaire.

Time must be taken to follow a structured series of steps in order to develop an effective questionnaire. Without this structure, the questionnaire will be in danger of becoming both inaccurate and irrelevant. If questions within the survey become irrelevant then the questionnaire is failing to do its job efficiently, i.e. to obtain the required information to meet the research objectives. Figure 5.1 details the main steps the researcher considered when embarking the design of the questionnaire.

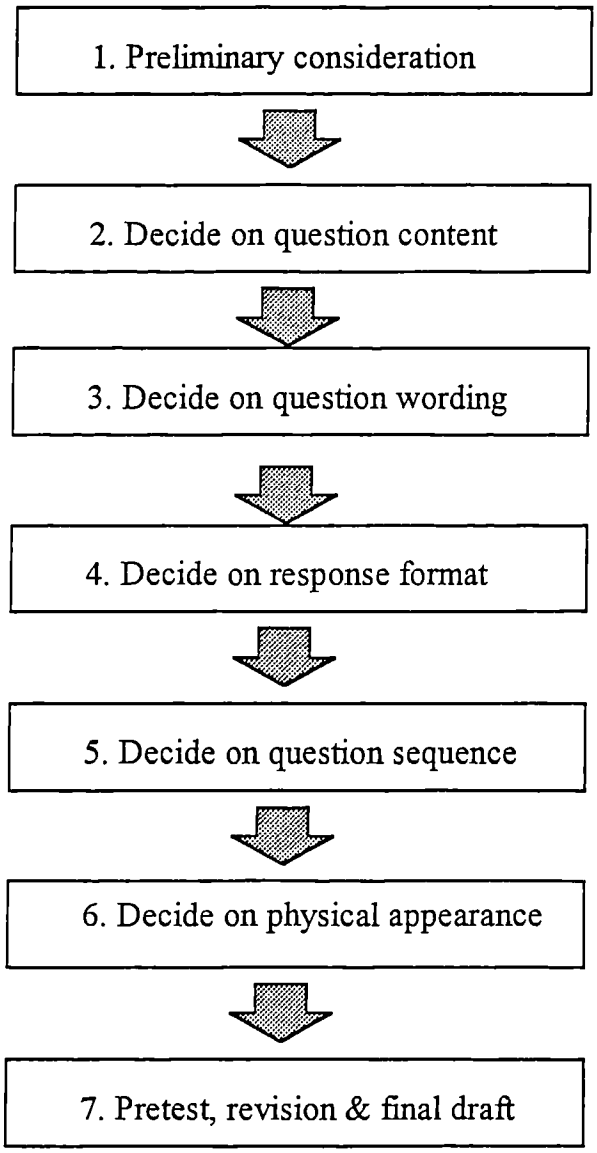

Figure 5.1: Steps in Constructing a Questionnaire

When developing a questionnaire there are several types of question which the researcher can utilise to gain the information required. The question can ask for fact (e.g. name, age, position) or for an opinion. These types of questions can be broken down into two types, open-ended questions, and closed-ended questions.

5.1.1 Open-ended Questions

Open-ended questions are structured in nature, but the participant is free to answer in any way he chooses. No set responses are offered by the questionnaire. As a result, it is up to the respondent to interpret the question and develop an answer without the bias associated with other types of question. This type of question has both its advantages and disadvantages. An advantage is that you can gather rich information, the researcher can ask deeper questions and obtain different perspectives on a subject area. This enhances the researcher's background knowledge and can help him to interpret responses to other questions. In addition this type of question can also turn up new avenues of interest which could be followed up at a later date, gleaning information that might not otherwise have been available. Furthermore this type of question is less likely to influence the respondent.

However, the variable nature of the open-ended questions can also lead to problems. The questions are more time consuming to complete and require the respondent to think more (which can put respondents off replying). Open-ended questions can also cause problems in analysis. Because there are no set responses, the task of tabulating the responses can be difficult and subjective. In addition, there is the problem of compatibility between different questionnaires, where perhaps people have interpreted the question differently.

5.1.2 Close-ended Questions

Unlike the open-ended questions, the close-ended variety have both a structured question and response. That is to say that the participant is presented with some sort of choice of answers and may not stray from those choices provided. As a result, this type of question has a lot more control associated with it, which in turn brings its own advantages and disadvantages. There are four main types of close-ended questions: multiple choice, dichotomous, ranking and checklist.

The multiple choice style of question overcomes many of the problems associated with an open-ended question. By providing potential answers, the questions are less time consuming for respondents to complete. Multiple choice questions also make things easier when it comes to analysis.

However, there are some major disadvantages to note. Foremost is the fact that this method requires that the researcher knows all the possible answers to a particular question. This problem can be overcome to some extent by providing an extra answer option of "other". This means that if none of the multiple choice answers match the answer the respondent wants to give, then he can add his own. However, this injects an element of openness to the question. The second problem is that the various alternative responses to a particular question may have different meanings for different people, thus immediately introducing error. Care must also be taken when phrasing the question and the potential replies to try and make sure that the choices available to the participant are mutually exclusive.

The second subtype to be considered here is that of dichotomous questions. This is perhaps the most basic of all questions and involves the answer of either 'yes', or 'no'. This type of question has advantages in that the questions are short and are thus quick and usually easy for the respondent

to answer. They are also very easy to analyse. Also because the questions are fairly specific, there is less opportunity for the researcher to inject bias into the situation. Finally, these types of question can be used as a lead into more in-depth, open-ended questions, where detailed information will be extracted. The dichotomous questions themselves however generally can't provide any detailed data to the researcher. In addition, this format forces the respondent into making a decision one way or the other, even though he may be unsure. This can be overcome to a certain extent by providing a 'don't know' option. However, although this may reduce the error response of the question, it can have an undesirable effect by giving the respondent a get-out clause to avoid thinking too deeply about the question.

The third type of close-ended question is known as ranking. This involves the respondent being given a list of various items and being asked to order them. This method produces results quickly and in a form that is both easy to tabulate and to analyse. The only disadvantages are firstly, that it is not possible for the respondent to differentiate between the interval in the order e.g. the first and second ranked item may be very similar in importance, whilst the rest are all way below. This information would not come through the question format. Secondly, there is a limit to the number of items that the researcher can ask to be ranked - it is sensible to keep the list to below ten.

The final type of close-ended question to be discussed here is the checklist. This involves a question being asked and a list of potential answers being provided. The respondent is then free to tick whichever answers he feels are appropriate. The respondent is not limited to tick only one answer. As with the ranking format, this style is relatively quick for the participant to complete and also for the researcher to tabulate and analyse. The disadvantage lies with the requirement that the researcher has to list all the possible alternatives - this requires a good deal of background knowledge on the part of the researcher. This problem can be circumvented to a

degree by providing the respondent with the opportunity to use a box labelled 'other' which they can customise. Again, this leads to the problems discussed earlier.

5.1.3 Types of Question Chosen

In order to keep the questionnaire flowing and the reader interested in its completion, it was decided to use a mixture of question styles, including:

- open-ended
- multiple choice
- dichotomous
- checklist

Different types of question were thought necessary in order to capture different types of information. The use of differing styles also made the questionnaire more attractive to the eye and also more enjoyable for the participant to complete - asking the same type of question over and over can become very tedious.

5.1.4 Question Wording

The art of asking questions is a difficult area to discuss here, but to summarise, there are certain guidelines which should be adhered to in order to produce as clear a document as possible. Firstly, the questions should be phrased in a straight-forward manner using simple English and words which are familiar to the respondent. Researchers should attempt to avoid leading questions which immediately detract from the credibility of the questionnaire. The questions should be unbiased and avoid suggesting particular answers

to the respondent. Equally important is the avoidance of assumptions which may lead to confusion on the part of the respondent and will result in inaccurate answers.

5.1.5 Question Sequence

There are various schools of thought on the sequence of questions which produces the best questionnaire results. However, as every questionnaire is different, these rules can only be applied in very general terms and a common-sense approach is necessary. For example, the questionnaire should start with questions which are fairly straight-forward in order to ease the respondent into the swing of things. Dichotomous questions are then useful to prepare the ground for more in-depth questions. If possible it is also advantageous to group similar types of questions together as this allows the respondent to tune into the type of style required. However, it is also necessary to group questions of a similar subject together in order to provide the questionnaire with a rational flow. Sometimes these two requirements are moving in opposite directions and so a compromise must be reached in order to ensure that the order of questions remains sensible whilst maintaining a degree of question type grouping.

5.1.6 General Layout

With respect to the general layout of the questionnaire there are a few basic rules which are crucial to success. This is especially important for a postal survey where the only contact with the participants is through the document posted out. Firstly, the questionnaire should always be accompanied by a covering letter describing the background to the project and its purpose. In addition, the length of the questionnaire should be kept to a minimum and instructions should be placed on the front page to describe how the

questionnaire is to be completed. Instructions should also be provided where necessary within the body of the questionnaire.

The questionnaire used in this survey and the covering letter can be found in Appendix A.

5.1.7 Reply Envelopes

Addressed envelopes were attached to all questionnaires in an attempt to encourage respondents to return their responses. In an attempt to keep costs down, it was decided not to provide reply paid envelopes in this case. As the questionnaire was being targeted at senior officers in universities it was felt that respondents would not be in the position of having to stamp their own mail (or pay for it personally) and therefore the absence of a stamp would not deter them from returning the questionnaire.

5.2 Research Findings

This section outlines the response to the postal survey and discusses the method of analysis employed.

5.2.1 Response Rate

Using the mailing list downloaded from the HESA web-site a total of 90 questionnaires were sent out to senior officers. Fifty six universities replied, giving a response rate of 62%. Two respondents however declined to complete the questionnaire. All other questionnaires received were correctly filled in, none were scrapped. This left 54 useful responses, i.e. 60% of the population sampled. The researcher was pleased with this level of response, especially given the seniority of the respondents. The majority of

responses came from Vice-Chancellors or Principals. Other responses came from University Secretaries, Registrars, Directors of Planning, Pro-Vice-Chancellors and Directors of Human Resources.

5.2.2 Method of Analysis

The questionnaires received were initially spilt into two piles based on responses to question one - those who said that they had undertaken a BPR exercise and those who said they had not. The data from each completed questionnaire was then examined, collated and entered into a number of Excel spreadsheets, where it was possible to tabulate the data and conduct an analysis of the information. The use of a specialist software package for questionnaire analysis was considered, however it was thought that the number of questionnaires being sent out was not so great as to necessitate a specialist package. Thus it was decided instead to structure the questionnaire in such a way as to allow easy analysis using a standard spreadsheet package (in this case Excel).

5.3 Analysis of Responses to Individual Questions

This section will consider each question is turn, stating firstly the question, followed by an explanation and, in some cases, graphical representation of the results.

Question 1

To your knowledge, has your university embarked on any kind of Business Process Re-engineering (BPR) activity ?

Yes ☐

No ☐ If you answered No, please go to Question 11

This dichotomous question aimed to quantify the number of UK universities who had undertaken a BPR exercise. Of the 54 completed replies, 25 universities (46% of the respondents) said yes, they had embarked on a BPR activity. Table 5.1 lists the responses in a tabular form.

Yes *Have embarked on BPR activity*	**No** *Have not embarked on BPR activity*
Aberdeen	Bradford
Abertay	Bolton Institute
Aston	Brunel
Cranfield	Derby
Glasgow	Dundee
Glasgow Caledonian	Durham
Heriot-Watt	East London
Hull	Glamorgan
Keele	Greenwich
Leeds	Kent
Leicester	Kings College, London
Liverpool John Moores	Lancaster
London Guildhall	Lincolnshire & Humberside
Loughborough	Liverpool
Napier	London Business School
Newcastle-upon-Tyne	Manchester Metropolitan
Northumbria at Newcastle	Middlesex
Nottingham Trent	Oxford
Open	Portsmouth
Queens University of Belfast	Salford
Sheffield Hallam	Southampton
Surrey	St Andrews
Thames Valley	Strathclyde
Ulster	Sunderland
University of West of England	University of Wales, Swansea
	University College, London
	University of Wales, Bangor
	Warwick
	University of Wales, Cardiff

Table 5.1: Respondents who have and have not embarked on BPR activities - June 1997

Questions 2 through to 10 applied only to those 25 universities who had embarked on a BPR exercise.

Question 2

Approximately how long ago did you embark on the BPR process ?	
Less than 6 months ago	☐
6 - 12 months ago	☐
12 - 18 months ago	☐
18 - 24 months ago	☐
More than 24 months ago	☐

This multiple choice question was aimed at establishing how long ago universities had started to use BPR. Three universities: Heriot-Watt, Surrey and Ulster had embarked on BPR activities less than six months ago. The majority, nine universities, had commenced BPR exercises between six and twelve months ago. These were: Aberdeen, Abertay, Cranfield, Glasgow, Glasgow Caledonian, Hull, Leicester, Napier and the University of the West of England (UWE). A total of five universities claimed to have started on BPR exercises 12-18 months before. These included: Keele, London Guildhall, Nottingham Trent, The Open University and UWE (who had multiple exercises ongoing). Newcastle-upon-Tyne, Northumbria, Sheffield Hallam, Thames Valley and UWE were five universities who claimed to have commenced BPR project 18-24 months ago. Finally, six universities claimed to have started BPR activity over 24 months ago. These were Aston, Cranfield (who also had multiple project ongoing), Leeds, Liverpool John Moores, Loughborough and UWE.

Question 3

Who suggested that you consider BPR ?	
University Management	☐
Academic(s) in own institution	☐
External Consultants	☐
Other (please state).....	

Question 3 sought to uncover the origins of BPR in UK universities. With the exception of only three out of the 25 responses, university management were given the credit for suggesting BPR. The exceptions here were Newcastle-upon-Tyne and Glasgow Caledonian universities where the suggestion came from academics, and Leicester University where the suggestion came from discussions with management at the local hospital who had undertaken a successful BPR project.

Four universities said that the suggestion came from more than one source. At Aberdeen the suggestion came from university management and also external consultants. In the case of Hull the suggestion was made by both management and academics, and at UWE it was a combination of university management, academics, and the Board of Governors. At Keele it was the Director of Human Resources, along with University Management who made the suggestion.

Question 4

In what areas of your organisation are your BPR efforts focused ?	
university administration	☐
academic faculty	☐
academic department	☐
support service	☐
Other (please state).....	

Question 4 set out to identify the focus of people's BPR efforts. Twenty three of the twenty five universities undertaking BPR had focused BPR efforts on the administration. The exceptions here were Aberdeen and Glasgow Caledonian universities. The next most popular focus for BPR efforts was in Support Services, with thirteen of the 25 respondents citing Support Services as being a focus of BPR. There was also evidence that BPR is taking place at departmental level, with twelve institutions sighting departments as being a focus. Nine respondents also told of BPR activities with a faculty focus.

In retrospect the researcher would have worded this question differently and instead asked respondents what types of processes were the focus of their efforts.

Question 5

Have you used the academic expertise within your university to help you with the BPR initiative ?		
Yes	☐	
No	☐	If you answered No, please go to Question 7

The majority, seventeen of the respondents said that internal academic expertise had been used.

Question 6

In what capacity have the academics been used ? (You may tick more than one box)	
In designing the exercise	☐
In modelling the processes	☐
Facilitating workshops	☐
Analysing the data	☐
Making recommendations	☐
Implementing changes	☐
Other (please state).....	

Of the seventeen universities who said they used academic expertise: ten said that they had used academics to make recommendations; nine employed academics as facilitators; eight asked academics to help in the design of the exercise; eight used academics for the implementation stages; six used academics for modelling processes and six asked academics to assist with the analysis. Figure 5.2 shows this in graphical form.

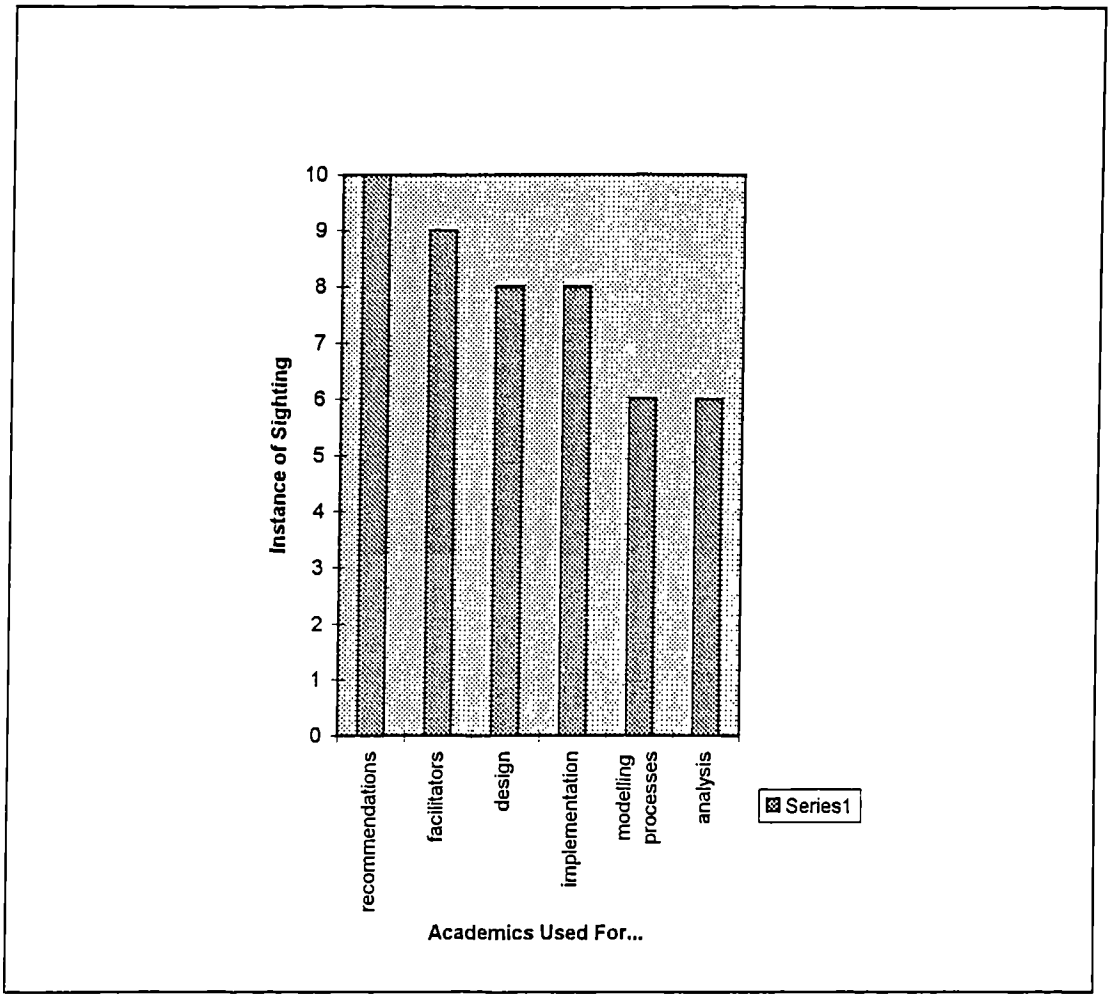

Figure 5.2: Use of Internal Academic Expertise

Question 7

Have you used external consultants ?

Yes ☐ Please Name .....

No ☐ If you answered No, please go to Question 9

Fourteen of the respondents had used external consultants. The consultants named are listed in Table 5.2 below. Coopers & Lybrand were the most commonly sighted consultants, with three universities naming them.

Consultants Named in Survey
Andersen Consulting
Coopers & Lybrand
Develin & Partners
Ernst & Young
Esteem
Gardener Merchant
Indepen Consulting
JFQ
Pact Consultancy
Whitbread Associates

Table 5.2: Consultants Named as Being Involved in BPR in UK Universities

Question 8

In what capacity have the consultants been used ? (You may tick more than one box)

- In designing the exercise ☐
- In modelling the processes ☐
- Facilitating workshops ☐
- Analysing the data ☐
- Making recommendations ☐
- Implementing changes ☐

Other (please state).....

Making recommendations was the most common role of the consultants, with twelve universities using consultants for this reason. Next came the roles of deigning the exercise, which 11 sited, and facilitating the exercise, again getting 11 votes. In eight cases the consultants had been asked to model processes, whilst seven institutions said that consultants were employed in analysis. In only two cases were consultants reported to be involved in the implementation. Figure 5.3 shows this in graphical form.

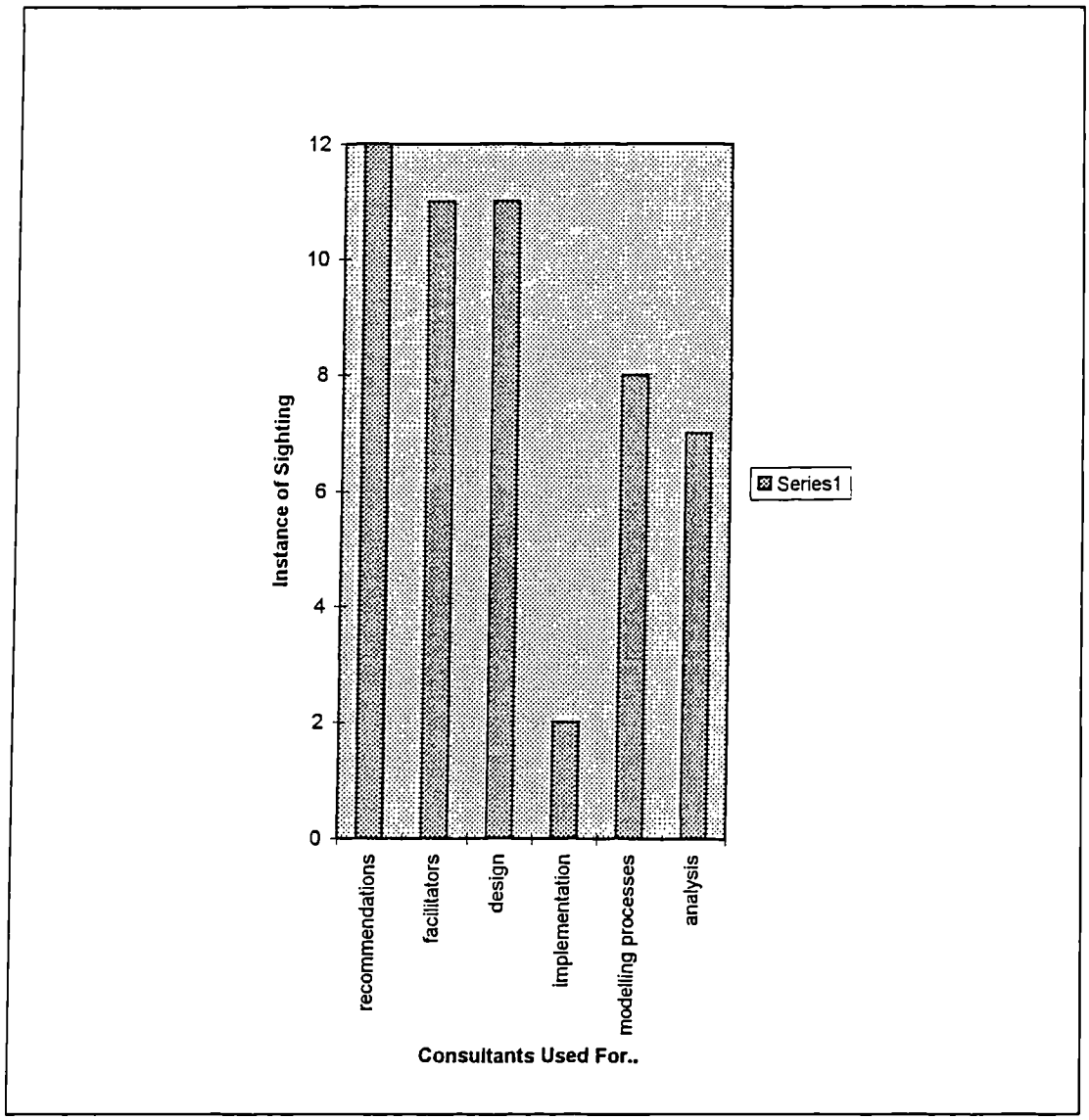

Figure 5.3: Use of External Consultants

Question 9

How would you class the improvements you have made/or hope to make ?	
Radical	☐
Incremental	☐

The majority, twelve, of respondents reported that their improvements would be classed as incremental. Six believed their changes to be radical, whilst three imagined both radical and incremental improvements were the result of their efforts. Two universities were not in a position to comment yet.

Question 10

Who is leading the BPR team ?
Name .....
Title .....

This question had two purposes, one to establish contacts for the in-depth interviews later in the research project and secondly to establish the level at which BPR projects were being run within universities. Analysis of this question shows that the great majority of projects are being headed by very senior people.

Questions 11 & 12 were aimed at respondents who replied No to Question 1, i.e. respondents who had no BPR experience.

Question 11

Has BPR been discussed at a management level within your university?
Yes ☐
No ☐

Question eleven was designed to help gauge the level of interest in BPR from the universities who have not yet undergone a BPR exercise. Six of the universities said that BPR had been discussed.

Question 12

Is your university considering embarking on a BPR exercise in the foreseeable future ?
Yes ☐
No ☐

This question was looking to identify universities who plan on embarking on a BPR program in the near future. Only two respondents said that BPR was planned, Sunderland and Portsmouth. The University of Glamorgan said that they were considering going down this path.

Question 13

Are you aware of any other UK universities undertaking BPR activities ?
Yes ☐ Please Name ……
No ☐

Sunderland and Portsmouth replied yes to this question, both saying that they believed the University of Northumbria to be undertaking a BPR exercise. East London identified the University of London as having experience of BPR in the area of Purchasing. All 51 others said they were unaware of any other BPR initiatives in the UK.

Question 15

Would you be interested in hearing more about this research programme and receiving a copy of the results of this survey ? Yes ☐ No ☐

This question was meant as a lead into further contact - the vast majority said that they would be interested in hearing more. Only eight respondents said no to this question.

5.4 Discussion of Questionnaire and its Findings

Having discovered little evidence of BPR activity within the sector in the literature, we resorted to carrying out our own primary research using a postal questionnaire. The postal survey set out to establish the extent of Business Process Re-engineering activity in UK universities. So, did the postal survey answer Research Question 4? The survey received a 62% response which encouraged the researcher and demonstrated that there was an interest in the topic from Senior Officers in UK universities. The postal survey suggested that 25 out of the 54 universities who responded were, or had been, involved in a business process re-engineering project. This figure surprised the researcher, given that there was so little information

to testify to this in the public domain. However, this result again encouraged the researcher as it showed that the research objectives were valid and important to the sector. It was also interesting to discover (through Question 13) that nearly everyone who was doing it thought that they were the only ones doing it. Thus, in conducting the inquiry, the researcher realised that she could make not only a contribution to the academic literature, but that she could also make a practical contribution by encouraging and facilitating discussion between universities interested in BPR.

With hindsight the researcher realised that some people might have different definitions of Business Process Re-engineering than others - and thus further investigation was needed before concluding that all 25 of the universities claiming to be conducting BPR exercises were talking about similar types of projects. In Section 4.2 we defined BPR projects as being ones that :

- focus on processes rather than functions
- involve radical change
- focus on activities that add value to the customer
- eliminating/reducing those that don't add value
- use IT as an enabler

Thus, further investigation was required in the form of in-depth semi-structured interviews to gain the qualitative information needed to fully answer Research Questions 4 and 5. Chapter 6 will now go on to discuss the results of the qualitative study.

CHAPTER 6

BPR IN UK UNIVERSITIES: ANALYSIS OF INTERVIEWS

In the last chapter, through analysing the postal questionnaire, we built up a broad picture of the extent of BPR activity currently underway in UK universities. In answer to Research Question 4, we established that there was a significant number of institutions reporting BPR activity. The aim of this chapter is to find out more about these institutions and their BPR programmes by digging deeper into each individual case, i.e. address Research Question 5. This was done using semi-structured in-depth interviews with senior personnel involved in the BPR exercises. This chapter reports on the findings of the interviews. It starts with a short summary of the "BPR initiatives" in the universities studied including the methodologies employed. The drivers for change, the problems and barriers encountered and finally those factors which were perceived to be critical to success are then discussed in more detail.

6.1 Modification of Research Question 5

Having answered Research Question 4 in the previous chapter, and having established that there is significant BPR activity within UK universities, the next research objective was to "take a look at a number of these initiatives and note best practice". However, in addressing Research Questions 1 to 4, the researcher realised that it was important to ask more specific questions at this stage in order to be able to move on to Research Question 6 (namely to develop a methodology for BPR for use within UK universities). Thus, at

the outset of this qualitative stage of the research, Research Question 5 was redefined thus:

- *to visit a representative cross-section of UK universities to try to ascertain: why they were doing it; what they were doing; what problems and barriers they had encountered; and what they had done that they felt to be important for success.*

6.2 Gaining Access to Institutions

In Chapter 4 when we considered methodological issues, the researcher chose to use semi-structured interviews to gather the qualitative data thought necessary. The first task then was to contact those people who had responded positively (i.e. had said that their institution was involved in a BPR exercise) and to arrange follow up interviews. This may seem like a straightforward task in the research process, but in actual fact arranging appointments took considerably longer than expected. Being early summer, many university staff were on holiday, attending conferences or at overseas graduations. This meant that many people had to be contacted again later in the summer, and thus this stage of the research processes ran in parallel with the interviews themselves.

Of the twenty five universities who responded positively to the questionnaire, ten were interviewed. Naturally the researcher would have liked to interview personnel at all twenty five institutions, however, a number of factors made this impossible. First, not all universities were willing to take part in the research. The researcher was tenacious in making call after call - and having come from a sales and marketing background the researcher would like to think that every effort had been made to get interview appointments. However, it was recognised that it was very senior people that were being asked to take time out of their busy schedules to be interviewed, and the

researcher fully appreciates that demands on their time have to be managed. Had there been more time available the researcher would have sought to identify other people within these institutions who would hold the information required. However, there was neither the time nor resources within this project to make this possible.

This brings us to the next factor which put constraints on the research process - finance. Due to the fact that this was not a funded project, financing travel etc. associated with the research was down to the researcher herself and to the money she could squeeze out of the postgraduate research budget. Therefore cost was behind the decision not to target the universities of Surrey and Ulster as it was felt that they were too isolated and too far away to justify the travel expenditure. At all stages of the project, every attempt was made to keep costs to a minimum.

6.3 The Interview Structure

An agenda was produced that could be shown to every person being interviewed at the start of each interview. A copy of this Agenda is included in Appendix B. Each interview started with the researcher providing the interviewee with some background to the research project, along with the aims of the study. There were two reasons for doing this: firstly to set the interview in context, and secondly to inform the interviewee of how the information provided would be used. Next the researcher took the interviewee through the results of the postal survey, using the interviewees' own completed questionnaire as a prop. This was intended to gain the interest of the interviewee, and also to ensure that the interview was of value to both parties and not just a one-way communication. This approach also proved to be fruitful in opening up discussion.

Having set the scene, the interviewer was now in a position to start gathering quality information. The agenda for the meeting set down three main areas for discussion: 'Why?', 'How?' and 'Problem Issues' and 'Success Factors'. Thus the person being interviewed was clear on the structure the interview would take. The researcher also had a topic guide containing prompts for questions she wanted to ask. A copy of the topic guide can be found in Appendix B. The researcher was careful to strike a balance between sticking to the topic guide, whilst still remaining flexible to discuss important issues that came up in discussion. In closing the interview, the researcher always asked the subject if there were any questions he wanted to raise. Again this gave both parties an opportunity to explore interesting avenues of discussion. The majority of interviews lasted between sixty and ninety minutes.

6.4 Overviews of the "BPR Initiatives" Studied

Before proceeding to analyse the drivers, barriers and success factors, this section will provide a short overview of each of the BPR initiatives investigated and bring out pertinent points, including the scope and focus of the exercise, the people involved and the methodologies employed.

6.4.1 University of Leicester

Initiated by the Vice Chancellor this small-scale pilot project focused on the processes within the Research Administration Office. Coopers & Lybrand (Education) were the consultants employed at a cost of around £15,000. A Steering Group was formed, membership consisting of: the VC, who chaired the Group; two external consultants; two people from the Research Administration Office; and two academics from the Management Centre. The high level methodology employed consisted of three phases:

Phase 1: Discover (which involved a walk-around to find out who does what and a workshop that involved users from different faculties)

Phase 2: Redesign (which involved Coopers making recommendations, discussing these at a further workshop and refining their proposals)

Phase 3: Implementation (Coopers provided the University with an implementation plan and the University carried out this phase on their own).

The project was thought to be a success in that it highlighted non-value steps; showed where communication and the use of information technology could improve efficiencies; highlighted unnecessary form filling and control procedures; threw up issues of ownership and responsibility for processes.

The Pro-Vice Chancellor is monitoring the situation now that the implementation has been completed and feedback has been positive. Leicester plans to extend the exercise to other administrative and support processes in the near future.

6.4.2 University of Loughborough

Championed by the Special Pro-Vice Chancellor this initiative is still in the planning stages but promises radical redesign. The BPR approach stemmed from the Engineering Faculty where the SPVC was until recently Dean. Considerable effort has been put into researching Business Process Re-engineering and they have consulted widely both internally and externally. Five core processes have been identified and the next step is to create teams to model these processes:

- Undergraduate processes - "delivering the student to a career"

- Postgraduate processes - "delivering the student to a career"
- Research Degrees
- Grant Aided Research Work (public domain)
- Contract Research Work (not public)

The main aims of the re-engineering initiative at Loughborough are to:

- produce enough savings to cope with HEFCE cuts
- address the balance between academic and central service budgets
- get people to recognise customers
- fund ongoing IT projects
- free up resources to do things like devoting time to finding new sources of funding.

6.4.3 University of Northumbria at Newcastle

What started as a systems review under the stewardship of the Director of Personnel has turned now into a full-scale redesign exercise with a full-time Project Manager with Pro-Vice Chancellor authority and with the full support of the Vice Chancellor. Coopers & Lybrand (Education) were the consultants employed. They designed the exercise and made recommendations but it was the task groups that carried out most of the analysis and implementation. Coopers BreakPoint BPR methodology was used which involved the three high-level steps: Discover, Redesign and Realise. This is a fairly wide-reaching initiative looking at the following processes:

Administrative Processes:

- faculty management
- budget management
- staff recruitment
- student recruitment
- research administration

Support Processes:

- corporate affairs/public relations
- educational development
- Uni-Link (commercialisation of university technology)
- student services

Academic Processes:

- more of a general SWOT (strengths, weaknesses, opportunities and threats) analysis rather than BPR at this stage.

The overall impression of this project is that it not a "clean sheet of paper" style BPR but rather more incremental in nature - yet wide in scope and promising to offer substantial cost savings along with many other benefits including a customer oriented and quality culture.

6.4.4 Nottingham Trent University

The programme ongoing at Nottingham Trent University is another initiative that started as an IT systems review but has evolved into a BPR project. KPMG (Education) were the main consultants used (although other

consultants were involved on the IT side). The Vice Chancellor is championing this project and has put a lot of time and effort into communicating the change message to staff and students alike. Staff and student involvement has been central to this project - with task teams made up of people from various backgrounds doing most of the modelling of existing processes. The benefits sought from this project are less of a financial nature and more to do with increasing service and quality for both internal and external customers. This project was described by one key player as "logical incrementalism leading to radical change".

6.4.5 University of Abertay

The University of Abertay have embarked on a Strategic Change Project which has four elements:

1. Cost benchmarking

2. Scenario Planning/Management Development

3. IT & Learning Support

4. Portfolio Analysis

The first element, the cost benchmarking exercise is currently underway, funded by SHEFC. Ben-Johnstone Hill (of Nottingham) are the consultants employed in benchmarking five of the post-92 Scottish universities in terms of their cost structures. Abertay hope that this information will help them to re-engineer their cost structures.

The Scenario Planning element is being conducted by an external consultant (John Lord). The Local Enterprise Company (Tayside) has contributed funds for this part of the project. The Portfolio Analysis is being conducted in-house by two academics from the School of Management. It is based around John Sizer's (1984) tool but they have adapted it to suit their own requirements.

The impression was that Abertay have a young, dynamic management team and a fairly strategic, managerial approach to the running of their university. However, whilst the researcher viewed the current initiatives as being strategic and interesting, she would not class the initiatives at Abertay as being business process re-engineering as they did not meet the criteria set down in Section 4.2 of this thesis. In particular they are not focusing on processes or on activities that add value to the customer.

6.4.6 University of Glasgow

This project at Glasgow University started when the Director of Planning, on inheriting responsibility for student returns, decided to review the handling of student records. This project was well planned and managed - with the planning phase taking five months and initial redesign taking only two months. Arthur Andersen were the consultants used in this case, largely because they were one of the few local providers who claimed to have BPR expertise. Glasgow benefited from having an in-house BPR expert within the School of Management who was happy to get involved and direct the project. From day one they realised that they weren't talking about radical BPR but rather processes improvement. The initial project team consisted of the Vice Principal, the Head of Registry, a representative from Arthur Andersen, the Director of Planning and the internal BPR expert. They had a team building day and established a formal group.

Focus groups were held and they identified five core processes to do with student records: recruitment; induction; changes; exams; graduation/exit. Teams then modelled the processes - involving as many people as possible. A meeting was arranged, involving all concerned, to discuss the model they had come up with. They then identified a few quick wins and also developed a long term vision of what the student records process should look like.

Within two months they were able to go back to the University Management Group and present their vision, highlighting quick wins. At this point they also presented a proposal, along with a budget to take the project forward. UMG gave the go ahead and five project teams have been established to take the project forward. Everyone the researcher spoke to viewed this project as being a success. It brought people from various functions together and would appear to have instilled a team culture within those involved with the student records processes and developed a sense of ownership.

6.4.7 University of Newcastle-upon-Tyne

This large scale project at the University of Newcastle-upon-Tyne started in 1995 when the decision was taken to devolve financial management, human resource management and student administration to faculty level. This decision led them to realise that they would need a new finance system to make the new structure work. Ernst & Young were called upon to advise on the new system. They decided to take the opportunity to look at new ways of doing things before making decisions about IT platforms. Workshops were set up to look at administrative and support processes and three teams were established to look at Finance, Human Resources, and Students respectively. Members of the teams were fully seconded from their jobs and it was their role to organise workshops and model the processes with the help of consultants. The University settled on SAP as their preferred

solution. Going down the SAP route has made this university think in terms of processes at least within administration, and it is radical and large scale.

6.4.8 Heriot-Watt University

A new Principal at Heriot-Watt University heralded the start of this initiative. The approach here has been to re-visit the management structure; then the academic departments; and only then will they be able to reshape the administration to suit the new structure and processes. Each academic department has been asked to produce a business plan including where they see income coming from, what they hope to achieve in the next research assessment exercise and what resources they need to get there. Effectively departments are being looked at as strategic business units with five year rolling plans.

Again, whilst Heriot-Watt appear to be taking a strategic view of their university, the initiatives seen here fall short of the criteria set down in Section 4.2 to qualify as Business Process Re-engineering.

6.4.9 University of Aberdeen

The initiatives at Aberdeen University are particularly focused on the interface between academic departments and the administration. Esteem were the consultants used in this instance. The Regional Strategic Change Initiative gave Aberdeen, Robert Gordon's University and the Northern College funding to raise IT awareness and this is where Esteem became involved - they suggested the "BPR exercise" as a natural follow on from this. They facilitated workshops aimed at identifying areas where IT could be used to greatest benefit. This highlighted areas such as student records, research publications databases, etc. They are also looking at restructuring

and are appointing new staff to provide an interface between faculties and central administration.

Again, this project failed to meet the BPR criteria set down in Section 4.2

6.4.10 University of Hull

Concern over the incompatibility between academic and administrative computer systems - and disillusionment in the offering served up by the MAC[1] initiative - led to this initiative at the University of Hull. The initial concern lay mainly in the area of student records. In particular the new Secretary and Registrar was not happy at the prospect of signing HEFC returns without being able to personally guarantee the accuracy of the information. Nor was he happy to sign degree certificates when he could not be sure of the accuracy of information relating to student exam records. A steering group was formed, consisting of the Director of Estate, the Director of Finance, the Registrar, the Director of Academic Services, A Pro-Vice Chancellor and an Honorary Professor (in the role of consultant) and a few representatives from the academic community.

Processes were examined and a new information system designed, bringing together academic and administrative computing and giving access to all who needed it. Information is put into the system as low down the chain as possible, reductions are sought in administration costs and everything uses windows front ends in order to make use attractive and simple.

[1] Launched in 1988 by the then University Grants Committee (UGC), The Management and Administrative Computing (MAC) initiative set out to provide management information systems for 62 UK universities

This project has definite elements of BPR but has been approached from the IT viewpoint - with IT being the central issue rather than being used as an enabler.

6.5 Drivers for Change

Common to almost all the institutions studied were the following drivers for change:

- Competition (10 out of 10 universities quoted this as a key driver)
- Growth (9 out of 10 universities quoted this as a key driver)
- Changes in structure (8 out of 10 universities quoted this as a key driver)
- Information systems review (7 out of 10 universities quoted this as a key driver)
- Financial pressures (7 out of 10 universities quoted this as a key driver)
- Concern over increasing administration costs (6 out of 10 universities quoted this as a key driver)
- Desire for transparency and quality of information (6 out of 10 universities quoted this as a key driver)

6.5.1 Competition

Competition for students is also a key driver for change. A number of universities interviewed recognised the need to streamline their student recruitment processes (Loughborough, Northumbria, Glasgow). There were two main issues here: firstly a desire to improve customer service (in this case customers being students); and secondly a desire to reduce the administrative burden on academics and free up their time for research and teaching.

6.5.2 Growth

The rapid expansion of the sector has meant that many universities now find themselves having to address issues related to their quick growth - the quick fixes made to cope with additional load can only hold for so long without requiring major attention. And its not just the increase in students where there has been growth. Demands from external agencies, quality audits, SHEFC/HEFCE returns, the increase in research applications etc. have all lead to resources being stretched. Given such pressures a greater number of universities have been looking to put in place systems which will help increase efficiencies and free up currently stretched resources.

One university chose to start their BPR efforts by focusing on the processes handled by the Research Administration Office. There were two main reasons for selecting these processes: there had been growing complaints from the academic community about the quality and speed of service; and the office was growing and of significant importance to the university's strategy. In this instance the BPR team discovered that the process was held up by excessive checking and control which was further aggravated by poor communication.

6.5.3 Changes in Structure

Many universities are either looking at their structures or else have recently undergone changes to management structure. Whilst some universities are moving towards centralisation of resources and responsibilities, others are moving in the opposite direction, towards decentralisation.

Whatever the change, universities are finding that new structures demand new systems. One university (Loughborough) found tensions between central administration and faculty administration following a move to a

situation where budgets were handled by faculties rather than departments. The result was in-fighting between faculty and central administration which led to duplication and waste. Or, as another BPR Project Director put it, "Here we have the worst of all worlds ... a notional devolution to faculty... but very central control."

The same university also realised that with their new faculty structure they were able to utilise resources more efficiently - an example being that in the past departments might need a technician for certain work so they employ a full time technician who isn't fully utilised. If this is true in a number of departments then this creates un-necessarily high overheads. With a faculty structure technicians can be shared between departments in the faculty.

6.5.4 Information Systems Review

Time and time again, interviewees talked of the need for computer systems which were compatible and user friendly. Many universities were disappointed that the MAC initiative had not provided a solution that met their changing needs. In the face of this disappointment universities repeatedly reported having two options: making do with what they got from MAC or having a strategic look at processes and information flows before making any decisions regarding hardware or software. As one university Secretary put it, "the choice was to either make what we had work, integration, or to take the opportunity to take a fresh look and to improve efficiencies. We went for the second option. Then someone said 'hey isn't this BPR!'"

Quite a few BPR projects started out as IT or systems reviews (Nottingham Trent, Northumbria, Abertay, Newcastle, Hull). In some cases such reviews started as a strategic initiative, others because they had run into problems, some because it was funded under government initiatives (HEFCE/SHEFC,

JISC etc.), and some people chose to package BPR initiatives as systems projects for political or resource reasons.

6.5.5 Financial Pressures

At a time when universities are being asked to do more with less resources, naturally the desire to cut costs and increase efficiencies was a driver for change. However it was not quoted as the main driver in any of the universities investigated. This may have been because it truly wasn't the most pressing driver, or it could be put down to the fact that people in universities wouldn't want to state cost cutting as being a prime issue. However, cost benefits were mentioned by a number of universities, and the issue of cost savings were highlighted as a reason why BPR projects received management backing. As one Registrar put it, "We discovered that up to three sets of records were being kept. There was lots of duplication and people spending time reconciling differences between them. We therefore thought that if we could ensure that the information was only put in once, with some quality assurance, we could reduce the cost by two thirds".

6.5.6 Concern over increasing administration costs

Another popular topic of conversation among university staff, in particular the academic staff, is the lack of transparency of information - particularly financial information. The majority of institutions have some form of top-slicing or taxation on income coming into the university - but many academics feel that they don't see where this money is going. Naturally, when money is tight this concern is magnified and there is a need for accountability.

Academic staff are seeing an increasing proportion of their research grants and other incomes going to Central Services which to many appears to be growing disproportionately to the academic community.

6.5.7 Desire for transparency and quality of information

It is not just a desire to see where money is going, but also a need for transparency of other information that is driving many initiatives. With many institutions devolving responsibility for resources and decisions down to departmental level, departmental heads need to have access to accurate, up-to-the minute information. At the moment many academics are finding that the information they need is held by people in the administration - and is very hard to access or indeed understand. A number of universities still operate academic and administration computing systems which are incompatible - or else the information is codified in some way which makes it difficult for the academics to make sense of - this is particularly true of finance systems.

6.5.8 Other Drivers

Before leaving the issue of drivers for change, there are a few other important drivers that warrant attention yet did not fall neatly under the above headings. The first point is that a number of projects started with someone coming into a new job, or taking on new responsibilities (Hull, Glasgow). Another interesting point is that SHEFC actually used the word re-engineering in their strategic change initiative letter. Five of the new Scottish universities have a benchmarking project funded under this initiative. And perhaps this may mark the start of a new wave of BPR type projects if money is made available.

6.6 Problems & Barriers to Change

Interviews with personnel involved in BPR projects within universities highlighted the following barriers to successful BPR:

- politics and bureaucracy (10 out of 10 universities quoted this as a problem)
- lack of performance measures (9 out of 10 universities quoted this as a problem)
- structures set in stone (6 out of 10 universities quoted this as a problem)
- leadership (5 out of 10 universities quoted this as a problem)
- yet another initiative syndrome (5 out of 10 universities quoted this as a problem)

6.6.1 Politics and Bureaucracy

The main message that came from the interviews was that cutting through politics and bureaucracy made BPR efforts slow and in some cases endangered them altogether. One Dean had this warning about letting committees manage a BPR project, "committees seem to find small issues to look at and they take their eyes off the main issues". Another Director of Planning pointed to bureaucracy as being a reason why things don't get done, "people won't take decisions because there is so much bureaucracy".

It was seen as important that stakeholders in processes be involved as much as possible in redesign efforts, but one Project Manager warned against forming representative groups, "the problem with representative groups is that everyone is there defending their own interests. It also tends to be managers who sit on the committees and they aren't necessarily the ones who understand the processes."

6.6.2 Lack of Performance Measures

The lack of performance measures was often quoted as being a problem in UK universities. Many Senior Officers see this as being a major issue in any type of change exercise - without performance measures, how can you tell if the change has been for the better ? "I'm still not convinced you can apply it to academic departments. Performance measures are the problem."

6.6.3 Structures Set in Stone

This particular barrier was not so much one that was vocally identified by those interviewed, but more an issue that was evident. One Human Resource Director did note that, "people see the structure as being a very formalised thing".

This particular barrier became very obvious to the researcher as she visited institutions. While people would talk about business processes, there was still no getting away from talk of departments and functions. There were a number of instances where redesign of processes was limited within functional boundaries.

6.6.4 Leadership

Whilst many BPR commentators rank leadership as a key success ingredient for BPR projects, lack of leadership was often quoted as being a problem or barrier to successful BPR within the university sector. "Leadership is the major barrier to BPR in universities". Unlike some of the corporations that have implemented BPR programmes, universities rarely have strong leadership. As one Personnel Director put it, "the trouble is

management aren't really professional managers- they are just good committee people or researchers".

6.6.5 Yet another initiative syndrome

Universities have been party to many "initiatives" over the past few years and many people working within them are weary of exercises, reviews and initiatives. "...a lot of people thought that things wouldn't change... that it was just another initiative" The Project Director who saw this as a problem tackled it by ensuring that the project had the full backing of the Vice Chancellor and that the momentum of the project was kept up. Using external consultants was also felt to help in giving the project a higher profile and in demonstrating management commitment.

The following quote from a Vice Chancellor illustrates how important it is to keep up momentum, "as is true with many management change initiatives, people do it and then they see it as done and over. People stop talking to one another and they start working the new system."

6.7 Success Factors

Each interviewee was asked to identify factors that they thought were important to the accomplishment of their BPR efforts. The following factors were identified by interviewees as being important to the successful accomplishment of BPR:

- Communication (10 out of 10 universities quoted this as a critical success factor)
- Support from Management (7 out of 10 universities quoted this as a critical success factor)

- The BPR Team (6 out of 10 universities quoted this as a critical success factor)
- The Business Case (4 out of 10 universities quoted this as a critical success factor)
- Culture Change (4 out of 10 universities quoted this as a critical success factor)

6.7.2 Communication

"Communication has to be a critical success factor." This simple quote in essence sums up the sentiments of everyone interviewed. Whether you would agree with one interviewee in believing that "it's impossible to over-communicate", or not, there is strong evidence to support the importance of communication. Publicising early successes helped a number of projects gather momentum, "a few quick wins was good", and involving people in the redesign process was also a success factor, "appreciation from people that they were being consulted this time helped".

6.7.2 Support from Management

Support and re-enforcement from management was identified in a number of instances as being crucial to success. Depending on the nature and scope of the initiative this support might come from the Vice Chancellor, "...the Vice Chancellor is leading it... he has put his weight fully behind it...it wouldn't work if he wasn't behind it", or from lower rungs of management, "support from the Deans really helped".

One university (Northumbria) recognised that their BPR efforts needed to be seen to have the support of senior management. They therefore appointed a Project Director (who came from the academic community) and installed

him on the Vice Chancellors corridor to signal that he had the full support of the Vice Chancellor. He was also given Pro-Vice Chancellor authority.

6.7.3 The BPR Team

Interviewees stressed the importance of getting the right people involved in BPR teams, and most found little problem in getting volunteers, "people found it rewarding to work in teams and spread their wings". One Director of Planning also advised universities to consider team building sessions prior to starting any BPR exercise, "my advice would be to have an introductory team-building day...it might seem silly at the time but we found it very useful".

The fresh input given by consultants was thought to be valuable - but a couple of people warned of over-reliance on external consultants, "the problem with BPR in universities is that its difficult to bring in outsiders who don't know the system".

6.7.4 The Business Case

If backing from management was agreed to be important, the business case was demonstrated as being a good way of getting it. The ability to show management the cost savings expected (or the quality or service gains to be made) proved to be a powerful influence. As one BPR leader said, "we were able to attach a cost to the process... in terms of time and resources. That scared everyone."

6.7.5 Culture Change

There is no point in changing systems without getting people to buy into them and to see the benefits of continuous improvement. The majority of people recognise this - but putting it into practice would appear to be more difficult. "You either have to have a culture within the institution that suits BPR or a very senior change agent."

Whilst the BPR exercise may start people thinking about improvements, it is important to keep encouraging people to look for ways of improving the system.

6.8 Discussion

This Chapter has documented the main findings of the qualitative research and has answered Research Question 5, namely "to visit as many institutions as possible to try to ascertain: why they were doing it; what they were doing; what problems and barriers they had encountered; and what they had done that they felt to be important for success".

Whilst the researcher would have liked to have visited all the universities claiming (in responses to the postal survey) to be involved in BPR initiatives, this was not possible due to issues of access, funding, time and resources.

So, what did we find ? Firstly, investigation of ten universities claiming to be doing business process re-engineering revealed that three of initiatives, when studied against the criteria set down in Section 4.2, did not qualify as BPR projects. Thus it is the researcher's opinion that only seven of the ten universities investigated are actually involved in business process re-engineering initiatives.

To recap, in Section 4.2 we stated that whilst there is some confusion in the literature as to what BPR involves, that there is general consensus developing that BPR involves:

- focusing on processes rather than functions
- radical change
- focusing on activities that add value to the customer
- and eliminating/reducing those that don't add value
- using IT as an enabler

The three initiatives that failed to meet the criteria all failed because they did not have a clear process view. All three of these initiatives, whilst strategic, were still focusing attention on departments and functions - and not on processes. The researcher believes that in two cases (Aberdeen and Abertay) it is the consultants that have used the term BPR to describe the work being carried out.

Of the seven initiatives that the researcher would classify as BPR, there is tremendous variation in the scope and scale of the projects. This will be discussed further in Chapter 7.

In terms of drivers for change within the sector, there was general consensus that institutions were being forced to change in order to cope with the changing circumstances surrounding them. The main drivers quoted were:

- Competition
- Growth
- Changes in structure
- Information systems review

- Financial pressures
- Concern over increasing administration costs
- Desire for transparency and quality of information

Interviews showed a genuine interest in applying BPR methodologies to processes within the university. There was however evidence to support the need for a specific methodology to suit the context of the university. Particular issues and problems that universities trying to use existing methodologies came across included:

- politics and bureaucracy
- lack of performance measures
- structures set in stone
- leadership
- yet another initiative syndrome

Factors that were thought to contribute to success included:

- Communication
- Support from management
- The BPR Team
- The Business Case
- Culture Change

In concluding this chapter, Research Question 5 has been answered and the findings from addressing this aspect of the research can now be used to help build a methodology for business process re-engineering applicable to UK universities.

CHAPTER 7

FURTHER ANALYSIS AND DISCUSSION

In the last two chapters we have reported the results of both the quantitative and qualitative surveys. In this chapter we shall analyse the results of the surveys in conjunction with the theory which we have come to master. In doing this, we will critically examine the issues we have uncovered to be surrounding BPR in UK universities. This will form the basis for building a methodology for BPR in UK universities (i.e. addressing Research Questions 6 & 7 which will be addressed in the next chapter), and for our conclusions (which will be presented in Chapter 9). The chapter, however, starts by looking at the progress we have made to date in addressing our research questions established at the outset of the project.

7.1 Have we met our research objectives thus far?

Before proceeding any further, let us recap on our research progress. The last two chapters have reported on the findings of the primary research carried out - but has this research answered our original research questions set down in Chapter 1 (Section 1.4) and discussed in Chapter 3 (Sections 3.1 and 3.2) ? By this stage in the research we would have expected to have answered our first five research questions before proceeding to research questions six and seven which have more of a developmental flavour. Let us thus examine Research Questions 1-5 in turn and discuss our progress to date in answering these questions.

7.1.1 Research Question No.1: to explore the competitive environment surrounding universities and to assess the need for organisational change in UK universities.

Chapter 2 of this thesis addressed this question and concluded that there is indeed a pressing need for organisational change in UK universities given:

- changing customer requirements;
- increased competition;
- decreasing public funding;
- increased public interest and accountability;
- the pace of technological change;
- increasing internal bureaucracy and spiralling indirect costs

Following interviews with senior academics, administrators and managers in UK universities, Chapter 6 presented further evidence, largely associated with the internal environment, which also pointed to the need to change. These included:

- communications and information systems issues
- financial pressures
- problems associated with rapid growth
- changes in structure
- concern over quality and accuracy of information

- desire for transparency of information
- concern over increasing cost of central services

7.1.2 Research Question No.2: to investigate the management philosophies, models and tools which have helped turn around manufacturing and service organisations.

Chapter 4 addresses Research Question No.2 by briefly looking at some of these philosophies, models and tools, and concluded that Business Process Re-engineering (BPR) was an approach that UK universities could learn from. Section 4.17 showed that whilst there was evidence in the literature of American universities and colleges adopting a BPR approach, to date only one UK conference paper suggested the use of BPR in UK universities. This initial review of the literature encouraged the researcher to continue with her original research plan (which is discussed in Section 3.6).

7.1.3 Research Question No. 3: to explore the possibility of effectively transposing these philosophies, models and tools.

Chapter 2 (Section 2.9) outlined the contextual differences between UK universities and business enterprises. The nature of the differences suggests that there may be problems in trying to adopt existing BPR methodologies in UK universities. It was thus argued that existing methodologies for Business Process Re-engineering be examined in the light of the UK university context and modified to create a new methodology suitable for the UK university context.

Chapter 6, Sections 6.5 and 6.6 add further evidence to support the case for a customised methodology. Section 6.5 provides evidence (from interviews with senior personnel involved in BPR projects in UK universities) of

problems and barriers they have found in transposing BPR methodologies. Section 6.6 documents factors that were considered to be important for success. These factors will be used to help develop a customised methodology in the following chapter.

7.1.4 Research Question No. 4: to investigate the extent of BPR activity currently underway in UK universities.

This question was addressed by means of primary research. The results of a postal survey carried out in May/June 1997 are documented in Chapter 5. Questionnaires were sent out to senior officers in all 90 UK universities. The survey attracted 56 responses, a response rate of 62%. This was considered to be a very good response given the seniority of the people targeted.

The postal survey suggested that 25 universities, out of the 54 useable responses, had or were at the time of the survey, undertaking a BPR initiative. Twenty nine respondents said that their institutions were not taking a BPR approach.

Whilst 62% was considered to be a good response to the survey, it still equates to 36 institutions (38%) who did not reply. In retrospect the researcher wishes she had pursued responses from these 36 institutions either by means of a follow-up phone call or by means of a second mailing. However, things are always clearer with hindsight.

Expecting some non-responses, the researcher had built into the questionnaire a question aimed at uncovering further BPR activity. Question 14 asked respondents if they were aware of any other UK universities undertaking BPR activities. An overwhelming 51 respondents were unaware of any other UK university involved in BPR projects. This response

surprised the researcher given that the survey had shown 25 institutions to be involved in such activities. Only three respondents were aware of any other universities undertaking BPR. Two respondents named Northumbria (which the survey had already established) and one respondent suggested that the University of London may have experience of BPR relating to purchasing activities.

The researcher took one further step to try to uncover any further BPR activity in UK universities. She organised a workshop on "BPR in UK Universities" and invited all the original senior officers targeted by the postal survey (other mailing lists were also employed to publicise the event). This event brought to light two further universities undertaking BPR - the Universities of Staffordshire and De Montford.

Thus, taking the responses to the postal questionnaire at face value, at least 28 UK universities are believed to have experience of some sort of BPR project. Three other universities suggested in the postal survey that they were expecting to embark on a re-engineering programme. In addition, following the workshop, the researcher has also been asked to speak to Management Boards in two further universities who are now considering a BPR approach.

In answer to Research Question No. 4, then, there is evidence to suggest significant BPR activity in UK universities.

7.1.5 Research Question No.5: to take a closer look at a number of these initiatives and note best practice.

Having established, by means of the postal survey, those UK universities claiming to be using BPR and having established contacts within these institutions, the next phase of the research was to visit as many institutions

as possible to try to ascertain why they were doing it, what they were doing, what problems and barriers they had encountered and what they had done that was felt to be important for success. These new research objectives were thought to be more concrete than trying to judge "best practice" which would be subjective. The new research objectives were also thought to provide more solid foundations for developing a BPR methodology appropriate for the university context. Interviews were carried out in ten UK universities in an attempt to answer these research questions. A full discussion of the findings of these interviews can be found in Chapter 6. Unfortunately finance was one of the constraining factors that prevented the researcher visiting all the universities who claimed to be undertaking BPR initiatives. However, that aside, the interviews threw up some very interesting issues that further supported the need for a special BPR methodology to suit the university context. It is these issues that the remainder of this discussion shall deal with.

7.2 What have we found ?

In this section we shall highlight and discuss the main issues and findings of the research to date.

7.2.1 Concern in UK universities about the changing environment and the realisation that internally things need to change

In Chapter 2 we reviewed the current environment surrounding universities and concluded that given the current environment, something had to give. The researcher recommended that universities need to change and suggested that they look to other industries to see how they had changed and adapted under similarly changing environments. Further evidence of the need to change came from first-hand accounts during the interviews carried out in ten UK universities (as reported in Chapter 6). Thus, primary

research carried out in addressing Research Question 5 added to the arguments set out in Chapter 2. Tables 7.1 and 7.2 show the main drivers for change uncovered by this research.

changing customer profile
changing customer requirements
decreasing public funding
changing relationship with society
increasing competition
increased public interest and accountability
rapid technological change
spiralling indirect costs

Table 7.1 Drivers for change identified from the literature

internal customer dissatisfaction
computer systems which are incompatible, outdated and cumbersome
cost cutting exercises
desire to increase efficiencies
new structures demanding new systems
lack of transparency of information - particularly financial information
increasing proportion of money being allocated to central services
administration which to many appears to be growing disproportionately to the academic community
devolving responsibility highlighting need for access to accurate, up-to-the minute information

Table 7.2: Drivers for change identified during interviews with senior personnel

7.2.2 An Interest in BPR

The problems faced by UK universities, as set out in Section 7.2.1, suggest that they are ripe for Business Process Re-engineering. They are classic contemporary problems as discussed by Michael Hammer when he set out his re-engineering manifesto in 1990.

From the primary research carried out it would appear that it is not only the researcher who holds this opinion. The response to the questionnaire demonstrated that there was interest in the use of Business Process Re-engineering in UK universities, and the interviews backed this up. In particular, it was the BPR in UK Universities workshop that really made the researcher realise the extent of the interest. Fifty delegates attended and probably the same again expressed an interest (but due to other commitments, expense, travel, time of year etc. they could not attend). Taking on board the interest the researcher started a mailbase list and at the current time there are over 70 members (a list of members can be found in Appendix D). Furthermore following the workshop the researcher has been asked to present to a number of universities who are now interested in adopting the methodology. A conference devoted to the topic is also now being planned at the University of Kent.

7.2.3 Evidence of BPR Activity

The questionnaire and wider consultation and discussion showed that at least 28 UK universities think that they are conducting BPR. Out of the ten institutions studied only seven were judged by the researcher to be of a BPR nature (based on the criteria set down in Section 4.2). Whilst other universities are using the term BPR to describe their change initiatives, it is thought that some are being misguided by consultants into believing they are

doing BPR when in fact they are still focusing on departments and functions - as opposed to processes.

Thus, of the ten universities looked at in-depth, seven were regarded to be employing business process re-engineering. So, what did we observe in these seven universities ? One area that we haven't discussed in any depth yet is the type of processes that are the subject of BPR activities. Back in Chapter 4 (Section 4.7) we looked at the different types of processes that have been identified in business enterprises. We noted that Porter (1985) had identified two key sets of activities, namely "primary activities" and "support activities". Childe et al (1995) concur with the CIMOSA (1989) typology of "manage", "operate" and "support" processes. The question is, can we identify similar "categories" of processes within UK universities ?

7.2.4 Business Processes in UK Universities

The traditional split seen in UK universities is between academic staff and administrative staff. Universities exist to fulfil a dual role - teaching and research (at the most basic level). Traditionally many institutions have regarded teaching and research as being their primary processes, carried out by academic staff. Administrators have often been viewed as support staff, a "civil service" if you like - essentially supporting the academics and decision makers, and focusing largely on processes and procedures. Today however the division is not so simple. As universities have become increasingly large and complex, academic staff are expected to do more of what would traditionally been regarded as administrative tasks - such as student recruitment, quality returns, industrial liaison, financial management etc. Staff employed in an administrative capacity are increasingly involved in management decisions and activities - traditionally associated with senior academics. Also, given the competitive environment, many people would consider processes such as student recruitment and admissions, industrial

liaison, marketing, alumni relations etc. as being critical processes to the organisation - for without students there would be no teaching and without funds for equipment there would be no research. Thus, it would be wrong to say that academic staff are involved in primary processes and administrative staff look after the support processes - that would be far too simplistic in today's environment.

However, the researcher would suggest that processes within UK universities can be divided into "primary", "support" and manage "processes" - we just have to get away from the traditional mindset of academic and administrative activities. So, what do we mean by primary processes ? Primary processes are those directly related to satisfying the requirements of the external customer. Childe et al (1995) suggest that primary processes for a manufacturing organisation will involve: developing products; getting orders; fulfilling orders; and supporting products. Manage processes are those which are concerned with strategy and direction setting as well as with business planning and control. Support processes typically act in support of primary and manage processes. They include the financial, personnel, facilities management and information systems provision activities. Figure 7.1 shows this in graphical form.

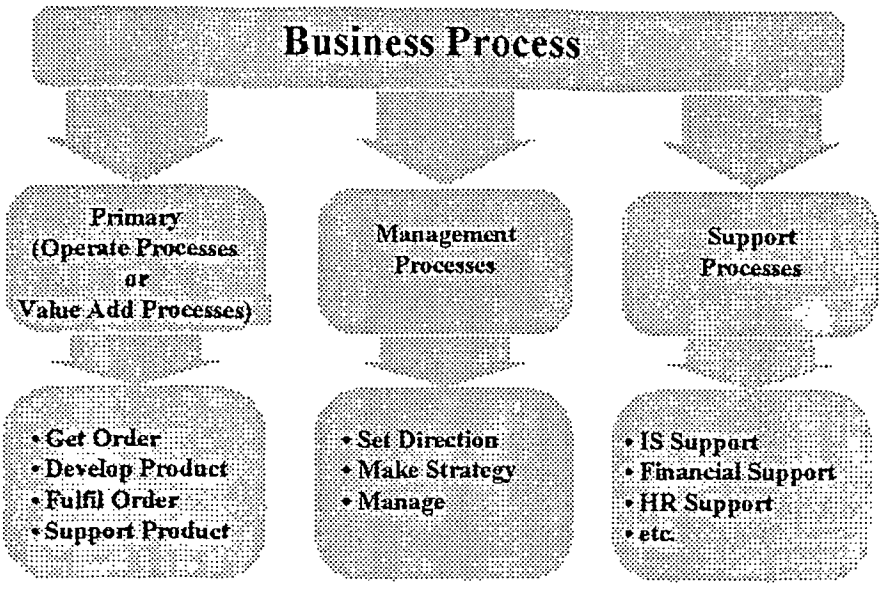

Figure 7.1: "Primary", "Management" & "Support" processes in manufacturing organisations. Source: Bititci (1997)

So, how can we translate this to the university context ? Remember there are primary, manage and operate processes at different levels of analysis - if we take the whole university as the scope of our study then we can see that primary processes involve things like: developing courses; recruiting students; delivering courses; supporting students; getting research grants; carrying out research etc. Manage processes will include: developing the university's mission and strategy; monitoring activities etc. Support processes include: facilities management, purchasing, human resource management; etc.

Universities differ from manufacturing organisations in that they have more than one raison d'être - they have a teaching mission, a research mission, a mission to serve industry and the community (as well as individual missions that might include things like to encourage life-long learning, to carry out applied work with industry etc.). Whilst manufacturing organisations will have more than one output, and more than one set of customers, the university is set apart in that it has somewhat disparate missions (and hence processes) and customers.

It is for this reason that the researcher advocates splitting the university into "business areas" before trying to categorise processes. This fits better with the idea of using Porter's (1985) "value chain" concept as a framework to help group processes. The CIM-OSA standard, which also groups processes into "operate, manage and support" provides a recognised framework around which to group processes. In this framework, "operate" processes are viewed as those which are directly related to satisfying the requirement of the external customer. Again, by separating the university into "business areas" we can separate the university's disparate customers. Figure 7.2 suggests the typical "business areas" found in most UK universities.

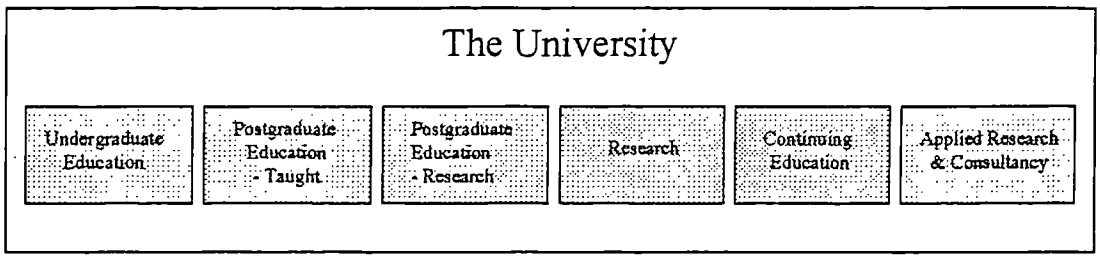

Figure 7.2: Typical Business Areas Found in UK Universities

In science policy circles there is some debate as to whether a university must be active in all six business areas. This is not an argument for this researcher to get tied up in - it is enough to say that current funding arrangements certainly push universities to be active in all six of these business areas.

Each of these business areas will have operate (or primary), manage and support processes. Figure 7.3 shows some of the high level primary processes under each business area.

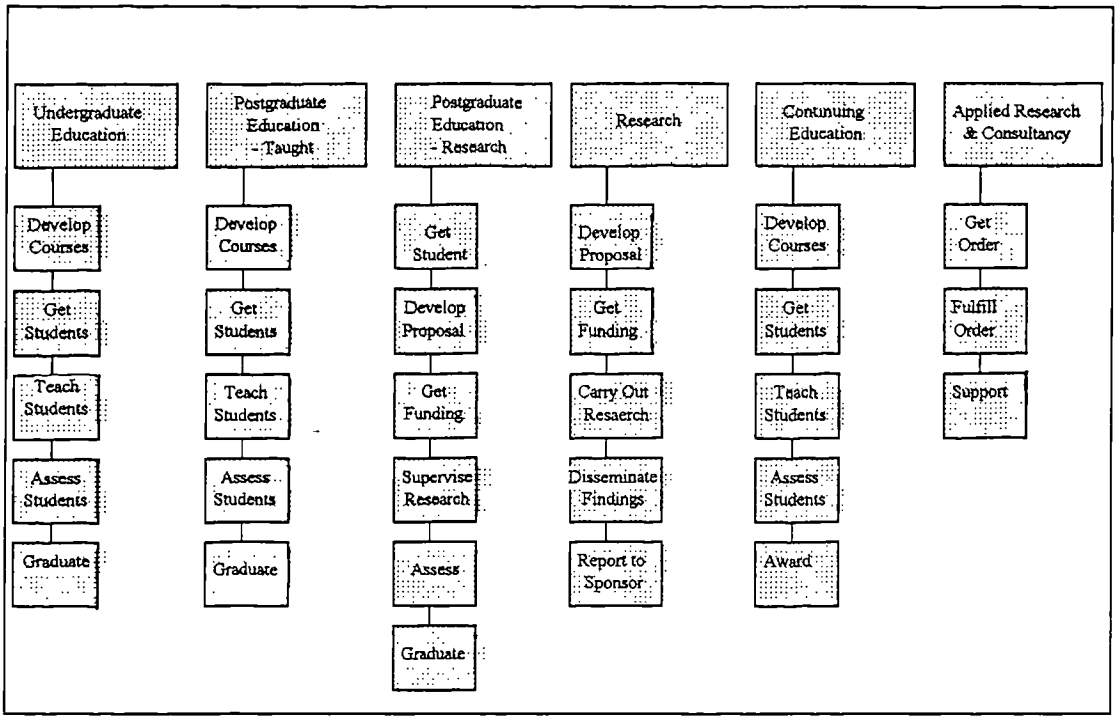

Figure 7.3: High Level Operate Processes for Each Business Area

Going back to the universities investigated we see that most of the BPR activity has been focused on support processes, (such as information systems provision, facilities management, research contracts management etc.) with a minority of activity focusing on operate (or primary) processes (e.g. student recruitment and admissions). This researcher found very little evidence of BPR activity looking at manage processes.

7.2.5 But Not a Paradigm Shift

Childe, Maull and Mills (1996), in studying BPR in thirty six UK based manufacturing and service organisations, reported witnessing a paradigm shift. That is to say, they felt that process based BPR had changed the way that senior managers construe their organisations, in that departmental functions have been replaced by processes, with the focus on the external customer, rather than on departmental skills and hierarchy. This researcher would not say that she has witnessed the same paradigm shift in UK

universities. Whilst she has found that senior officers in universities are now aware of the concept of processes, they haven't let go of traditional structures within their own organisations. The researcher's own view is that things are changing but at a slower pace than in other organisations - and perhaps not fast enough for some institutions.

7.2.6 No Reason Why BPR Can't Be Used

As stated in Section 7.2.1, the types of problems faced by UK universities are not unique - business enterprises faced with similar problems have used BPR to turn themselves around. We have also established (in Section 7.2.4) that universities have similar generic types of processes as business enterprises - i.e. primary, manage and operate processes. It is the researcher's opinion that the way forward for UK universities is to adopt a process view. Having found an interest in BPR and clear evidence of successful BPR projects within UK universities (e.g. Glasgow University), this researcher sees no reason why BPR can't be successfully employed in UK universities.

7.2.7 But Clear Differences between UK Universities and Business Enterprises

However that is not to say that universities can just pick up a BPR methodology and run with it. Section 2.8 highlighted the different contextual issues surrounding universities. The interviews also backed this up, highlighting problems and issues that universities had found when trying to change.

7.2.8 The Need for a Methodology Designed Specifically for UK Universities

The findings discussed so far all point to the need for a BPR methodology for use in UK universities. We have examined how business process re-engineering has been employed by business enterprises and other not-for-profit organisations; we have established an interest in BPR within UK universities; we have established the drivers for change within the sector and concluded that these are similar to those driver which pushed manufacturing and service organisations to employ BPR; we have identified the main contextual differences between universities and business enterprises which might necessitate different approaches; we have researched and estimated the extent of BPR activity within the UK university sector; and finally we have investigated the problems/barriers and success factors identified by a number of universities using BPR. All of this has led the researcher to believe that there is a real and immediate need for a methodology for BPR designed specifically with UK universities in mind. It is for this reason that the next chapter will be devoted to building and presenting such a methodology.

7.3 Chapter Conclusion

This chapter has analysed and discussed the findings of the research thus far. Remember that the hypothesis that we set out to prove was that: business process re-engineering may provide UK universities with a methodology for change; but that the contextual differences between UK universities and business enterprises are so great that existing BPR methodologies couldn't be easily adopted by universities in the UK; yet, existing methodologies may be used as a basis for creating a methodology designed specifically for UK universities. In Chapter 1 (section 1.2) we developed seven research questions to further this aim.

This chapter has discussed the progress made in addressing research questions 1-5. We have concluded that indeed the first two elements of the hypothesis are true and we have gathered and analysed information that will allow us to now move on to prove the third element of the hypothesis, namely to develop a methodology for business process re-engineering specifically for UK universities. Chapter 8 will discuss the design of the methodology, and present the methodology itself.

CHAPTER 8

A METHODOLOGY FOR BPR IN UK UNIVERSITIES

Having discussed the research thus far, this chapter sets out to use the primary and secondary information gathered, along with detailed discussion and analysis, to conclusively prove the hypotheses set out in Section 1.4. It will be demonstrated that the context of UK universities demands specific considerations when designing a methodology for BPR in UK universities. A specification for such a methodology is established, based on an analysis of user requirements. Building on this specification, a methodology is developed, thus proving our final hypothesis that existing BPR methodologies can be used as a basis for creating a methodology designed specifically for UK universities. Finally, feedback is sought from "knowledgeable persons" with experience of BPR projects in the university sector, thus validating the methodology.

8.1 What Are We Trying To Achieve ?

Before proceeding further we should be clear what we mean by the term "methodology". Jayaratna (1994) provides a concise definition of a methodology, "a methodology should tell you what steps to take and how to perform those steps but most importantly, why those steps should be taken."

So, our objective is to set out clearly:

- the steps UK universities should take to re-engineer their business processes;
- a guide as to how to perform those steps;
- and a justification as to why those steps should be taken.

Section 8.6 sets out the methodology in detail, describing, explaining and justifying each step.

8.2 User Requirements

So, what do "change agents" in universities want from a methodology for BPR in universities? The following wish list was constructed following discussion with those involved in BPR projects who took part in the research, and with input from discussions during the BPR in UK Universities Workshop which was hosted by the researcher at the University of Strathclyde on 12 December 1997.

- A methodology that takes into account the "peculiarities" of the university situation (this will be considered further in Section 8.3)
- A methodology that uses the experiences of others in similar projects (this will be considered further in Section 8.3)
- A methodology that is flexible and can be used on both large and small scale projects
- A methodology that can be quickly and easily picked up by the re-engineering team

- A methodology that reduces dependence on expensive consultants

8.3 Comparison of Existing Methodologies with User Requirements

In Chapter 4, we discovered that there are many documented methodologies for business process re-engineering, but none developed specifically to suit the UK university context. Before attempting to build a methodology to meet the requirements of the sector, the researcher compared each of the fourteen BPR methodologies examined in Section 4.13 with the user requirements (as set down in Section 8.2). Table 8.1 shows the result of this comparison and clearly demonstrates the need to develop a customised methodology to meet the requirements of UK universities.

User Requirements	Existing Methodologies (Refer to Section 4.13)													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
A methodology that takes into account the "peculiarities" of the university situation.	✔	X	X	X	X	X	X	X	X	X	X	X	X	X
A methodology that uses the experiences of others in similar projects.	✔	X	X	X	X	X	X	X	X	X	X	X	X	✔
A methodology that is flexible and can be used on both large and small scale projects.	X	✔	✔	✔	X	✔	✔	X	X	✔	✔	X	✔	✔
A methodology that can be quickly and easily picked up by the re-engineering team.	✔	X	✔	X	X	✔	✔	X	X	✔	✔	X	✔	✔
A methodology that reduces dependence on expensive consultants.	X	X	X	X	X	X	X	X	✔	✔	X	X	X	X

Table 8.1 Comparison of Existing BPR Methodologies with User Requirements

8.4 Methodology Design Considerations

Having established that none of the existing BPR methodologies meet the user requirements, we can now go on to design a methodology that does

meet the requirements of the sector. In examining existing BPR methodologies in Section 4.14 we found that whilst the methodologies were all different, there were a number of common factors, for example:

- most methods involve defining the project at the start
- most methods involve establishing a re-engineering team
- all methods have a redesign step
- all methods plan and implement changes

We want to use what we can of this existing outline framework. However, we need to take note of important differences in the university context. In earlier chapters, notably Chapters 2, 6 and 7, we have developed an appreciation of the contextual differences between UK universities and most other organisations. These differences were identified both by the researcher (Section 2.9) and by practitioners during in-depth interviews (see Section 6.6). The interviews also recorded the problems and issues UK universities had encountered in employing BPR methodologies. Using this understanding, let us now consider how these differences warrant a specific methodology for re-engineering within this sector. This section further develops and identifies design considerations for such a methodology given the contextual differences.

Let us start by considering the contextual differences between UK universities and business enterprises identified by the researcher in Chapter 2 (Section 2.9). Table 8.2 lists each of the differences noted and considers what effect this will have on the methodology design.

Contextual Difference or Sensitivity	Methodology Design Considerations
UK universities have diverse customers and stakeholders (see for example Peeke 1994 or Allen 1988).	• It will be important to include a step whereby customers and stakeholders of processes are identified early on. • It will be important to involve customers and stakeholders at crucial milestones.
UK universities obtain funds from taxpayers and from private sources (see for example Peters 1992 or Scott 1989).	• Performance measurement systems will be important given the high level of accountability. • The preparation of a business case at the outset may help secure the release of the necessary funding.
UK universities are not profit making organisations and emphasis is on service quality rather than profit (see for example Schuller 1995 or Williams 1989).	• Whilst cost efficiency will be a key objective, universities are not looking for savings which will increase profits, but rather that will ensure value for money. • Performance measurement techniques should be tailored for the university context, e.g. where appropriate using outcome measures as opposed to output measures.
UK universities lack clarity in objectives and have difficulty in measuring performance (see for example Johnes & Taylor 1990 or Cave et al 1988).	• It will be important to examine the mission of the university and identify core processes that relate to that mission early on. • Once objectives have been agreed it should be easier to put in place performance measurement systems.

Table 8.2: Contextual Sensitivities and Methodology Design Considerations

Individuals within UK universities will not necessarily share common goals or even view the organisation in a similar light. Organisations in the private sector tend to try to align individuals goals with organisational goals and create a shared vision (see for example Noble & Newman 1993 or Lockwood & Davies 1985).	• Gaining consensus will be difficult but important. It is critical that people are made to see the need for change. • Any changes should be linked to agreed performance improvement needs. • Communication will be crucial.
UK universities have a large percentage of "autonomous professionals" working within their boundaries (see for example Nixon 1996 or Lockwood & Davies 1985).	• Support will have to be won, people will have to be convinced - you can't take their support for granted. • Communication crucial.
UK universities suffer from lack of leadership and vision, with decisions being made by committees and with a Vice Chancellor in a fixed term office (see for example Bourgeois & Nizet 1993 or Thomas 1988).	• It will be important to find a leader for any BPR project - someone who has clear leadership skills (and not just seniority).
UK universities, as receivers of public money, and as providers of a public service, are very open to public scrutiny and need to be accountable (see for example Davies 1994 or Loder 1990).	• It will be important to build a business case and to be able to measure the results of the changes. • Crucial to keep stakeholders informed.
UK universities are highly influenced by political changes (see for example Midwinter 1993 or Shattock 1989).	• This necessitates the need for flexibility and continuous analysis and improvement.

Table 8.2: Contextual Sensitivities and Methodology Design Considerations

UK universities tend to be less flexible and unable to make decisions quickly or implement change quickly (because of systems of governance, public accountability, length of degree courses etc.). (See for example Hackman 1985 or Jarrett 1985).	• The methodology will have to take account of the pace of change in universities. • It will also be important to provide decision makers and committees with pertinent information to help them reach decisions. • Crucial to allocate enough time for tasks given the length of approval processes within the university. • Important to have a steady and tenacious project champion.
UK universities, on the whole, have a great deal of bureaucracy (see for example Warner & Costhwaite 1995 or Weick 1976).	• Accurate information will be important. • Crucial to progressively reduce bureaucracy and re-align organisational culture.
UK universities have less of a performance related culture in terms of human resource management (see for example Kogan 1994 or Merican 1993).	• The methodology will have to provide incentives for people to get involved in any change exercise that will take up peoples time. • Crucial that senior people, with authority to change HR policies are brought on board.

Table 8.2: Contextual Sensitivities and Methodology Design Considerations

We identified in Section 8.2 that users want a methodology that draws on the experience of others in the sector. Primary research identified problems or issues encountered by UK universities in using BPR methodologies and also factors that were considered to be important to success. Many of these issues have already been covered, but a few warrant special consideration.

Table 8.3 highlights the factors identified as causing problems or difficulties and considers how these should be incorporated into the methodology.

Issues Causing Problems or Barriers	Methodology Design Considerations
leadership Lack of leadership was often quoted as being a problem or barrier to successful BPR in UK universities.	• Crucial to have a strong project champion. • Who can in turn influence university management
Politics and bureaucracy Cutting through politics and bureaucracy was reported as slowing down BPR efforts and in some cases endangering them altogether.	• Don't add to the bureaucracy by letting committees take over the BPR project. • Early lobbying can help cut through the politics later on.
"yet another initiative" syndrome Some interviewees reported a general lack of enthusiasm due to over-exposure to initiatives that brought little benefit.	• Top level commitment needs to be demonstrated. • Constant communication and re-enforcement are needed. • Demonstrate the benefits by communicating "quick wins".
lack of performance measures Lack of performance measures makes it difficult to see benefits. It also makes it difficult to motivate people.	• Put in place performance measures that clearly relate to defined objectives. • Need to make performance measures pub ic.
structures set in stone Many universities find it difficult to restructure due to long standing tradition.	• Crucial to have commitment to change from the top. • Need to make people understand business processes.

Table 8.3 Problems & Barriers Experienced and Methodology Design Considerations

The primary research also identified a number of issues that were considered to be crucial to success - these should also be taken into account in designing an appropriate methodology. Table 8.4 shows the main considerations.

Success Factors Identified	Methodology Design Considerations
Support from management Support and re-enforcement from management was identified as crucial to success.	• Gain and maintain support from management at whatever level is appropriate for your project.
Communication Communication was consistently quoted as being crucial for success.	• Tell people what's going on and consult people. • Publicise success. • Make people want to keep informed. • Keep up communication at all times.
The BPR team Interviewees stressed the importance of getting the right people involved in BPR teams.	• Invite applications to join the team to make sure you have people who want to be there. • Important to create a team spirit. • Consultants can bring a fresh approach but don't let them take over.
The business case The business case was found to help gain support from management.	• Important to build a business case at the outset - both for planning and resourcing reasons.

Table 8.4: Success Factors and Methodology Design Considerations

8.5 Requirements Specification

We are almost ready to develop the methodology , but before we progress, it would be wise to draw up a requirements specification to clearly establish the parameters of the methodology.

Maull, Smart et al (1996) set down a framework, consisting of nine elements to specify a methodology. Using this framework, Table 8.5 outlines the specification of requirements for our methodology based on user requirements and taking into account our discussion of design requirements.

	SPECIFICATION
Objective	The objective of this methodology is to enable UK universities to identify and re-engineer business processes.
Target	UK universities with a desire to improve their efficiency and effectiveness
Conceptual Framework	Business Processes Paradigm
Scope	The methodology is designed to be used at any level of UK universities. Some universities may chose to use the methodology to re-engineer key processes on a large scale (i.e. look at the processes of the whole university) - but the methodology aims to be equally applicable to smaller scale re-engineering projects (perhaps only looking at processes that exists within departmental boundaries).

Table 8.5 Specification Outline

Structure	The methodology presented has six high level phases : Phase 1 Planning & Preparation Phase 2 Understand Existing Processes Phase 3 Redesign Phase 4 Plan Implementation Phase 5 Implementation Phase 6 Continuous Process Improvement
Tools & Techniques	The tools and techniques used in the methodology are characterised by: • low cost • low reliance on consultants and specialist software • an ability to be picked up quickly and easily
Participants	The size of the BPR team will be dependent on the scope of the project. Dependence of external consultants can be minimised, whilst utilising in-house expertise as appropriate.
Outputs	Outputs are clearly defined for each phase of the methodology
Delivery Mechanism	The delivery mechanism considers the specific characteristics of the target audience: • participation • low cost

Table 8.5 Specification Outline

8.6 The Methodology

In light of the research thus far, the methodology for process improvement in universities proposed in this chapter is a comprehensive six stage methodology designed to better equip universities to capitalise on the potential of business process re-engineering. Figure 8.1 outlines the main stages of the methodology.

The methodology offers a framework to guide universities through the BPR process. One of the requirements of the methodology was that it reduced dependence on external consultants. That does not mean to say that some universities may still wish to use external - the use of outside change agents has been found in some cases to be an important catalyst for change. The methodology raises awareness of the stages involved and the potential pitfalls and indeed critical success factors involved. Thus, using the methodology as a blueprint, universities may chose to use internal "consultants" to act as facilitators instead of employing external consultants.

The methodology consists of six high-level phases which provide the underlying structure. These are:

Phase 1 Planning & Preparation

Phase 2 Understand Existing Processes

Phase 3 Redesign

Phase 4 Plan Implementation

Phase 5 Implementation

Phase 6 Continuous Process Improvement & Measurement

The objectives of each phase can be summarised as follows:

Phase 1, Planning and Preparation is designed to set the BPR programme in motion by building a business case, gathering the necessary resources and putting a team together. This phase is particularly important for universities where in the majority of cases decision making is done largely by committee. Proper planning and preparation is thought to be needed in order to get the support and resources to proceed.

Phase 2, Understand Existing Processes is designed to give the BPR team a thorough understanding of the current ways of working, thus highlighting areas for improvement. Through modelling existing processes and through gathering information, the team can identify where waste and duplication occurs. This stage is also very important in order to give the team a benchmark against which to measure the re-engineered system. Only by understanding the old processes will you be able to measure how successful the change has been. This issue is very important to universities, where accountability is a major concern.

Phase 3, Redesign, as the name suggests, is designed to focus peoples' attention on finding new ways of working, and identifying how the process can be re-engineered. During this phase facilitators (internal or external) can help people to generate ideas and can also be useful in gaining consensus.

Phase 4, Plan Implementation, is designed to ensure that the implementation will be managed and run smoothly. Phase 5, Implementation, puts in place the new processes.

Phase 6, Continuous Process Improvement and Measurement is designed to ensure that the new process continues to be evaluated and improved. We

have noted that universities can be affected by political changes for example - thus it is particularly important the processes are continually monitored and evaluated in terms of the current environment. We have also noted that performance measurement is often a problem within universities. Phase 6 ensures that performance measurement systems are put in place along with the redesigned processes.

The following sections provide a detailed description of each of the phases. However, before presenting the methodology in detail, it should be noted that the methodology outlined here has been developed following a review of BPR projects in industry and a thorough investigation of BPR projects in the UK university sector. The methodology hopefully represents a contribution to the field of BPR in that it synthesises a comprehensive literature review with empirical research in the university sector.

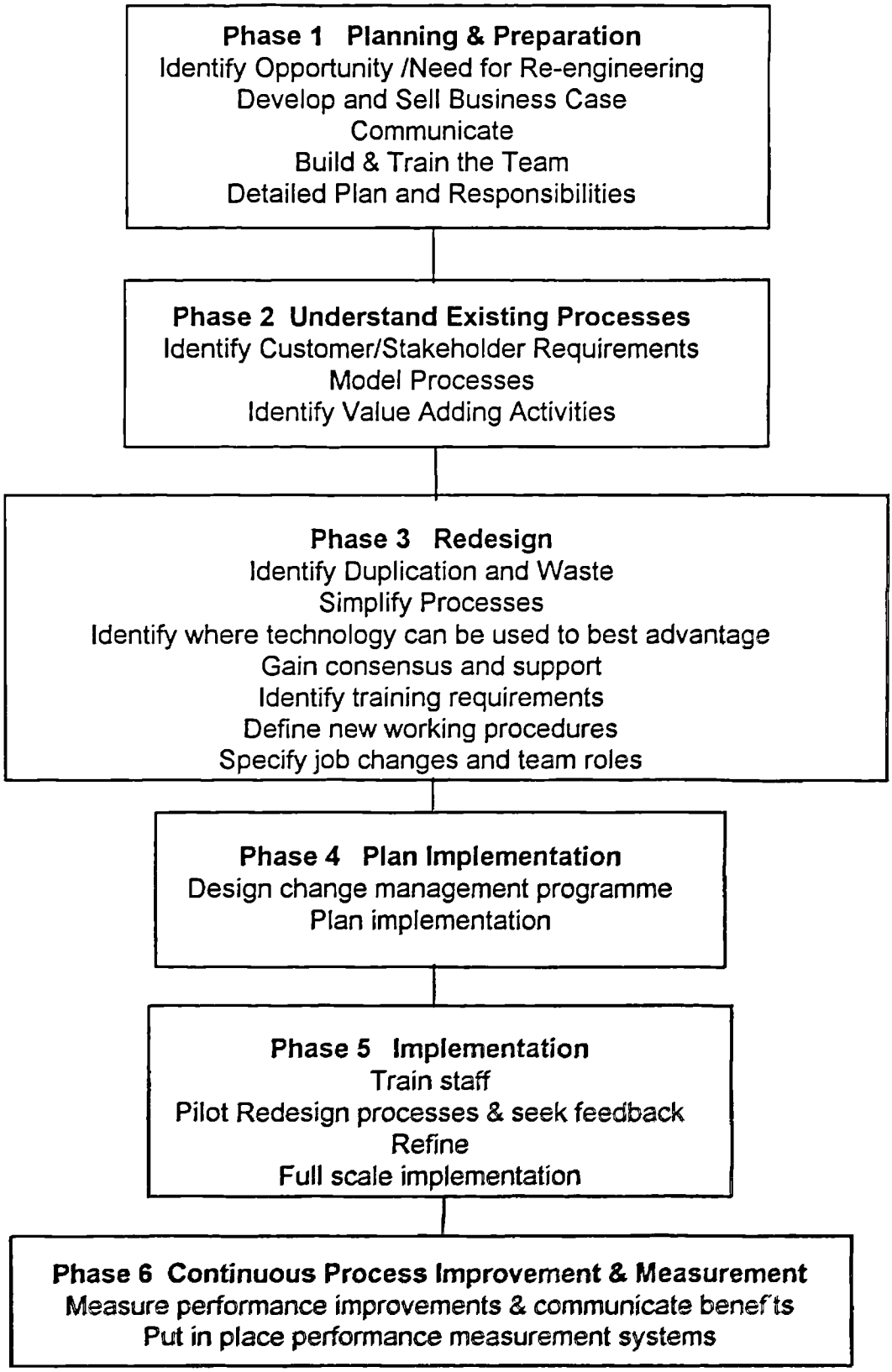

Figure 8.1 The BPR in UK Universities Methodology

8.7 Phase 1 : Planning & Preparation

The purpose of this phase it to mobilise the BPR project by putting in place the resources required and forming a BPR team. Given that we have just acknowledged that budgets are tight, politics are abundant, resources are limited etc., the planning and preparation stage is crucial to the success of any BPR project in a university setting. The methodology therefore puts considerable emphasis on this stage of the re-engineering programme. The activities involved in the Planning and Preparation stage include the following:

- Identify Opportunity /Need for Re-engineering
- Develop and Sell Business Case
- Communicate
- Build & Train the Team
- Detailed Plan and Responsibilities

8.7.1 Identify Opportunity /Need for Re-engineering

A question that might be asked here is where does re-engineering start in the university context, and by whom? Whilst in the manufacturing and service sectors many re-engineering initiatives have been initiated by the managing director and involve a fundamental look at all the processes of the organisation, this is an unlikely scenario in UK universities. It is the opinion of the researcher that the majority of UK universities will not be embarking on such large scale initiatives. Rather, it is more likely that re-engineering will be focused on key processes where problems or opportunities are evident. It is also more likely that the re-engineering project will be

suggested by someone involved in these processes rather than by senior officers (although the researcher is not ruling out such a scenario).

The most important thing to remember is that BPR is about processes - you are not re-engineering the university, or a department, or a unit - but the processes themselves. Processes might begin and end involving only one unit or department - but more often than not, processes cross departmental boundaries. It is important to realise this early on. For one thing some of the activities or steps that take place within the process might be out-with the remit of the person suggesting BPR. In this case before considering BPR the person must gain the support and authority to work outside his own remit. For example, a Registrar might see the need to re-engineer the student records process - but some of the activities within that process are carried out by academic staff, other activities are carried out by personnel within faculty offices etc. - therefore before proceeding the registrar would have to gain the permission to start poking around in other people's territory.

Some texts, and indeed many methodologies, start out with the assumption that someone says "let's do Business Process Re-engineering - now what will we re-engineer ?" An example is Parfett (1994) who suggests looking at processes where there is:

- excessive information exchange
- excessive checking
- fire fighting
- high error levels
- customer complaints/results of customer satisfaction surveys
- high inventory/buffer stocks (including paperwork)

Coopers & Lybrand (1994) in their publication for NACUBO suggest that universities should identify processes which have:

- a high number of annual transactions
- are of high cost to the institution to deliver
- are of high importance to the customer
- have low customer satisfaction

Indeed Coopers go as far as to suggest that universities should establish a matrix - where processes are judged against these criteria - and the ones that score high in all criteria are going to give the institution the most benefit if re-engineered. The researcher does not disagree with this in principle - but evidence from her research suggests that a more common situation will be where a problem (such as one or more of the things listed by Coopers as criteria) needs to be tackled and BPR is suggested as the means of doing this.

Techniques that can be used at this stage include brainstorming, cost/benefit analysis, focus groups, surveys etc.

8.7.2 Develop and Sell Business Case

As we have already discussed, the probability will be that processes you wish to re-engineer will spread across departments - which means that you will have to gain support before proceeding. The research has shown that management will be far more likely to support the project if you present them with a convincing business case that justifies investment in BPR. This is borne out by the experience of Glasgow University (see Section 6.4.6).

Initially management will want to know:

- why is the project needed ?
- what will it involve ?
- what resources are required ?
- what are the benefits expected ?
- how long will it take ?

Not only will this help to convince management to support the project, but it also has the added benefit of making you focus on the objectives of the BPR exercise, the resources needed, and how you plan on tackling the exercise. Further guidance on putting together a business case can be found on the ProSci BPR web page at http://www.prosci.com

8.7.3 Communicate

Having convinced "the management" (whoever they may be), you now have to convince everyone else. It is important at this stage that you gain commitment to the BPR initiative. Remember most people are afraid of change. You need to convince people of the need to change and demonstrate to them that the re-design process will provide an opportunity for everyone in the organisation to realise their full contribution to the organisation. Feelings of fear, which are a natural reaction to change must be converted to feelings of opportunity. The danger is that if communication is left to informal means, misinformation and rumour will lead to increased fear and resistance. It is therefore a good idea to have a communications plan from the start which puts the BPR team in control of information. A communications plan should include :

- what information is needed by whom and by when
- when will this information be available
- how to get this information to the people who need it
- feedback mechanisms

Manganelli & Klein (1994) maintain that the initial communication by the re-engineering team is vital because it sets the tone and context for the entire project. They suggest that the initial communication should be delivered as early as possible and should contain the following eight elements:

1. why the re-engineering project is needed
2. what the scope for the project is
3. what results management expects
4. who was selected to be on the re-engineering team and why
5. what will happen during the project and when
6. what involvement people will have in the project
7. what can be told now about how re-engineering will affect all involved
8. when the rest of the story can be told

They suggest that points 1-4 should be delivered by the project sponsor (the person from "the management" who is prepared to back the project) to underline the importance of the message and that points 5-8 should be delivered by the members of the re-engineering team in order to give people a sense of who they are and their commitment to the project.

Targets should be communicated as widely as possible - larger projects may make use of internal newsletters, project updates etc. to ensure that everyone is aware of the level of change which is being sought from the BPR project.

8.7.4 Build & Train the Team

Naturally the scale and scope of the exercise will determine the resources required. A few general rules: right from the start there should be input from the process owner (the person who will have overall responsibility for the re-engineered process); there will also normally be an input from an IT professional (perhaps someone from Computer Science or MIS); it will require an input from everyone involved in the process (including customers).

An effective BPR team requires the following:

- analytical skills
- project management
- a champion
- teamworking skills
- representatives from all parties involved in the processes under review
- creativity
- people with 'street credibility'
- owners of the relevant business activities
- IT professionals

If a university does embark on multiple re-engineering exercises then a common pattern is for a full time core team, supported by other part-time members, and managed by a project board or steering committee. In the university context I would strongly argue a case for a project manager to be appointed who has significant autonomy but reports into a project board/committee. The reason for advocating this approach is to maintain momentum and leadership - all too often committees in the university context can be slow at decision making and the momentum of the project is lost.

One thing the researcher did like about the Coopers/NACUBO methodology was their suggestion of establishing a "change management team" reporting to the Executive Steering Committee (which could be read, "the management"). Whilst the BPR team get on with the operational issues of re-engineering, the Change Management Team, consisting of senior staff have the role of managing the impact of the BPR project - they are the people who have the authority and resources to deal with issues such as

- performance measures
- recruitment policies
- redundancies and re-deployment
- remuneration issues and job descriptions
- publicising etc.

It is advisable to have a number of sessions with the team to ensure they: understand the concept of BPR; are happy with the methodology; and their roles within the team. This researcher would fully support the idea of holding a number of team-building sessions - this helps to accelerate team development. In addition, individual members of the team may have to be trained in some of the analytical tools and techniques that will be employed.

8.7.5 Detailed Plan and Responsibilities

Once the resources and the team have been established, the project manager must produce an initial plan outlining the subsequent phases of the project and detailing who will be responsible for each task. At this stage it should be possible to plan Phases 2 & 3 in considerable detail - whilst later phases will still be largely unknown at this point in time.

8.8 Phase 2 : Understand Existing Processes

The aim of this phase is to build up detailed knowledge of the existing process. In order to plan a journey you need to know where you are starting from - and the same is true of the BPR journey. The team must understand the existing processes in order to identify areas for improvement and to provide them with a means of measuring the improvements made.

This phase involves the following steps:

- Identify Customer/Stakeholder Requirements
- Model Processes
- Identify Value Adding Activities

8.8.1 Identify Customer/Stakeholder Requirements

BPR should be focused on adding value to the customer. So before any redesign takes place, the BPR team must be clear on who the customers are - who uses the output of the process under consideration. There may be a number of customers, and they might be internal to the university or external.

There will also be a number of stakeholders in the process, not least those involved in the process themselves.

Having identified the customers and stakeholders the BPR team should gather information from both groups, such as:

- what do the customers want from the process
- customer and stakeholder satisfaction levels
- what areas do they see as being priorities for improvement
- help in devising performance measurement systems that incorporate customer feedback

Techniques that can be employed at this stage include: surveys; quality function deployment (see for example Akao 1990) and stakeholder analysis (see for example Manganelli & Klein 1994).

8.8.2 Model Processes

To model or not to model ? There are those argue that detailed modelling runs the risk of the team getting bogged down in existing ("as is") processes which in turn encourages the team to stick with what they know and only look for incremental improvements - that is to say, some would argue that modelling hinders discontinuous thinking.

This researcher would probably take the stance that large scale, radical re-engineering projects should centre on a clean sheet of paper approach with discontinuous thinking being important. However this is less likely in the university sector. Universities are more likely to be involved in smaller, less ambitious projects (as we have seen from the research). These type of

projects, which are looking for more incremental improvements will benefit from more detailed modelling of existing processes. There is great value in examining existing processes for the following reasons:

- it shows exactly where existing processes fall down
- it gives you a benchmark which allows you to measure improvements and savings made following redesign

As well as building a process model of the process, the re-engineering team should also be collecting information about the process - such as:

- process inputs and outputs
- members of staff involved in steps in the process
- time spent by staff on steps in the process
- delay time associated with each step
- quality measurements such as error rates, customer complaints etc.
- why errors or quality problems arise
- what are the value adding steps in the eyes of the customer
- where (location) is each step performed
- the number of controls and approvals required - and reasons why these are needed
- any seasonal or cyclical changes to the volume of transactions

This information will give the BPR team ammunition for the redesign phase and will also provide information which will help measure the performance improvements achieved.

Techniques that can be employed here include IDEF modelling, flow charting, data flow diagramming, job analysis, work study and role activ ty diagramming to name but a few. For a fuller discussion of these techniques readers can refer to Kettinger, Teng & Guha (1997).

8.8.3 Identify Value Adding Activities

Here the BPR team should be looking at the activities involved in the current process with a view to identifying value adding processes i.e. those which contribute in some way to meeting a customer need or want. These activities will be needed in the re-engineered process.

Techniques that can be used here include focus groups, brainstorming (see for example Southern 1994), brown-papering, fishbone analysis, activity based costing, customer value analysis (see for example Kanevsky & House 1995) and quality function deployment.

8.9 Phase 3 : Redesign

The redesign phase is intended to produce a new improved process. The redesign stage involves both technical and social design and involves the following steps:

- Identify Duplication and Waste
- Simplify Processes
- Identify where technology can be used to best advantage
- Gain consensus and support
- Identify training requirements

- Define New working procedures
- Specify job changes and team roles

8.9.1 Identify Duplication and Waste

If you have mapped your processes then duplication should be quite apparent - also, talking to everyone involved in the process about their activities can unveil duplication and waste. If you do have a process map then one idea is to pass it round all concerned and get them to highlight where they believe duplication or waste occurs.

In every university studied, duplication was quickly identified. This was not surprising given that it is not uncommon for three, four or even more people to keep record on things like exam marks, student records etc. Much of this duplication stems from a control and administration culture. However most of this duplication is no longer necessary given our ability to store data centrally on computer and distribute access. The wastage found in checking and control systems can also be reduced by empowering staff to take responsibility for their own action and giving them the authority to take decisions.

Techniques that can be used here include fishbone analysis and value analysis (see for example Kettinger, Teng & Guha 1997).

8.9.2 Simplify Processes

Once you have identified excessive control steps, authorisation steps, or duplication then the next step is to look at cutting them out and simplifying the process. If possible get information put into the system at the lowest possible level and use technology to its full advantage.

Some general redesign rules:

- several jobs combined into one
- empower workers
- different processes to suit different situations?
- work is performed where it makes most sense
- internal controls and checks are eliminated
- reconciliation is minimised
- single points of contact for customers
- technology plays an important enabling role
- focus on performance measures and remuneration changes from attendance time to customer satisfaction
- values change from protective to productive
- organisational structures become much flatter
- managers change their role from one of supervising to one of coaching and support

8.9.3 Identify where technology can be used to best advantage

Technology is a key enabler for business process re-engineering. New, re-engineered processes will be informed by a knowledge of available technologies.

A good example here is Glasgow University who are looking to simplify their student records processes by empowering students with smart cards - thus

taking a large administrative burden off both academic and administrative staff. Another example of processes being simplified by technology, and unmet customer requirements being met through the use of technology, comes from the University of Newcastle-upon-Tyne. In this case the university chose to implement a SAP financial system which simplified financial processes as well as meeting the customers needs for distributed access to information.

In both of these cases, considerable resources were allocated to identifying and sourcing appropriate technology. BPR teams should be conscious of the role of technology and should ensure that they have on board the expertise necessary to take a strategic view of technology. In universities this expertise might come from computing or MIS personnel or from computer science department.

8.9.4 Gain consensus and support

If you are going to make changes that affect the way people work then you are going to have to gain their support - otherwise you are unlikely to succeed at implementing the changes (Mintzberg 1989). It is therefore crucial that people are consulted and involved in the redesign process.

The University of California, Loss Angeles' (UCLA) Chancellor in unveiling their "transforming administration at UCLA" project gained support through making it attractive to people. Key concepts he stressed included a shift to personal empowerment and accountability, elimination of bureaucracy, and the creation of appropriate incentives to facilitate these changes.

Closer to home, Staffordshire were successful at communicating to the university community at every stage of their re-engineering project. They ensured that almost everyone, students and staff were ab e to use ema -

and they encouraged people to use it by putting interesting and important information out on email. In doing this, the BPR team encouraged two way communication. In addition to this, they also made a point of talking to people face to face - they made themselves easily identifiable and accessible and encouraged people to come and talk to them.

8.9.5 Define New working procedures

Once consensus and support has been gained the BPR team can then go about defining new working procedures under the new process. It is here that the BPR team will have to work closely with the Change Management Team if there is one - or if not, they will have to work hand in hand with the personnel department and the managers of units/departments that the process cuts across. This stage will undoubtedly mean changing peoples' job content and responsibilities.

8.9.6 Identify training requirements

It is most likely that changes in working procedures will require an investment in training. You cannot expect people to pick up new ways of working without proper training. Obviously the nature of the changes will dictate the extent of the training required. If there has been a large investment in new technology then the training needs will be higher.

The worst scenario is the introduction of new processes without spending time and money on training. The result will be employees who are anxious and afraid of the new ways of working - and will not embrace them - indeed you may even find sabotage. The new system will fail - and any investment in change will be lost (see for example Boddy & Buchannan 1986). It is therefore essential that training needs are identified, budgeted for, and scheduled.

As with any BPR exercise, there will be a need to change the way people see their co-workers. In a re-engineered organisation everyone should view themselves as a customer contact person - i.e. see the person who performs the next step in the process as their customer. Every employee within the re-engineered process should understand that what they do is important to the ultimate quality of the service delivered to the external customer.

8.9.7 Specify job changes and team roles

Again at this stage it is important to co-ordinate with the Personnel Managers and line managers - it would not do to be issuing new job descriptions without the people's line manager knowing about it. Personnel will be involved at this stage in examining any changes that might be necessary in employment contracts, grades, salaries etc. Whilst business enterprises generally are more comfortable with changing peoples job descriptions and giving people pay rises and bonuses if deserved, UK universities have a national pay scale and have tended to stick to incremental progression up the scale, along with incremental rises. One-off payments and discretionary pay are becoming more common in UK universities - but are by no means the norm. When re-engineering, however, people's responsibilities and jobs may change quite radically - so innovative approaches to payment and reward are called for.

8.10 Phase 4 : Plan Implementation

This phase is designed to safeguard the implementation phase from hitting problems. The output of this phase is a detailed implementation plan with milestones and deliverables. It will be common at this stage for the BPR team to report back to the university management committee that sponsored the exercise. They will present their recommended process design, estimates of cost and time, and the implementation plan.

The Phase itself consists of two key steps:

- Design change management programme
- Plan implementation

8.10.1 Design change management programme

Managing the changeover from the old ways of working to the new redesigned process is going to be crucial. The literature tells us that more BPR failures stem from a lack of effective change management than from any technical problems. It will be important at this stage to make sure that:

- employees see the need for change
- employees are ready for change
- employees receive the appropriate training
- employees are kept informed at all times

It is advisable at this stage to identify the stakeholders and their likely issues with the changes. You may even wish to carry out a survey of stakeholders attitudes before and after the changes are announced. This will give you important information about the issues that people have and the things that are likely to contribute to resistance. Once you understand the issues that people have, it will be easier to do something to smooth the path for change. Communication, as always, is going to be crucial to success.

Having specified job changes and team roles it will also be important to define potential career paths. Since resistance to change stems large y from people's fears about how the change will affect them, it is vitally important to show them potential career paths in the new organisation. In fact this may

be one of the most important elements of the change management programme.

This phase of the methodology hopes to ensure that the university does not make the following common mistakes (Manganelli & Klein 1994):

- failure to clearly communicate what it wants employees to do
- failure to give employees the resources to do the job
- failure to give employees the training they require
- failure to give employees the authority needed to do their jobs
- giving employees incentives to do something different than what you want them to do

8.10.2 Plan implementation

The following activities should help you to produce a detailed implementation plan:

- identify all the detailed tasks needed for implementation (e.g. organ se workshop, produce newsletter, install software...)
- work out how much effort is needed - in man days (e.g. organise workshop needs 2 man days)
- Put names to each activity (e.g. organise workshop - Janice and Peter). Make sure the people involved are comfortable with the tasks they have been given. You will also need to clear it with their line manager.
- Work out the task duration (e.g. organising the workshop needs two man days - so with Janice and Peter working on it full time, it should be one day's duration).

- Work out the sequence of tasks - some tasks cannot be started until others are completed (e.g., software cannot be installed until it is purchased) whilst others can be done in parallel.
- Plan out a programme with start and end dates.
- Produce a Gantt Chart showing the detailed sequence of activities.
- Produce a plan detailing responsibilities and deadlines.

It is important to ensure that everyone involved in the implementation is consulted when producing the plan. Because of the seasonal nature of many of the activities within the university (e.g.. exam time, graduations, registration etc.) the BPR team should be sensitive to people's workloads. It would be unwise for example to try to implement a new student records process in December when many of the people involved in the process will be busy compiling HEFCE/SHEFC returns. The University of Hull found problems when they tried to introduce a new process (and new IT systems) during this particularly frantic time. The University of Glasgow on the other hand made a conscious decision not to put things off - their reasoning being that there would never be an ideal time for everyone concerned. The BPR team at Glasgow had sold employees on the need to change so effectively that they were willing to put in extra effort (over a short time period) in order to get the job done. The lesson here is that if you communicate the need for change effectively, and overcome resistance then implementation will be a lot easier for the BPR team!

8.11 Phase 5 : Implementation

The implementation phase will see the realisation of the re-designed process - first through pilot and then full scale implementations. If Phase 4 has been done with care, giving thought to the people side of the change as well as

the technical issues, then this phase should be entered with confidence. The Implementation Phase consists of the following steps:

- Train staff
- Pilot Redesign processes & seek feedback
- Refine
- Full scale implementation

8.11.1 Train staff

Training requirements should already have been identified and now it is a case of putting this into action. Although you want to ensure that training has been completed before introducing the re-designed process, be careful that you don't carry out the training too far in advance of the introduction of the new working procedure - otherwise people will forget.

8.11.2 Pilot redesigned processes & seek feedback

You can't just dump the new process on people and expect them to get on with it. If they find problems then they will turn against it - or revert back to the old way of doing things. Instead it is better to launch the new process as a pilot and tell people that it is such - let them know that they still have a chance to change things - to have a say. Once the pilot is in place, active y seek feedback. Be visible - don't sit back and wait for people to come to you - get down there to the coal-face and watch the new process being performed - actively seek feedback. Techniques that can be useful n gathering feedback include surveys, focus groups, discussion benchmarking.

8.11.3 Refine

Having gathered feedback it may be necessary to carry out changes to make the process more workable.

8.11.4 Full scale implementation

Once you are happy that you have ironed out any concerns that have been voiced or made any suggested improvements - make it live.

8.12 Phase 6: Continuous Process Improvement and Performance Measurement

This phase is important firstly in that it measures the success of process improvements made and allows you to communicate the benefits of the exercise. Secondly it is important to continuously measure the performance of the process (and the people who perform it) in order that things aren't allowed to slip into bad old ways.

This phase involves the following:

- Measure performance improvements & communicate benefits
- Put in place performance measurement systems

8.12.1 Measure performance improvements & Communicate benefits

Because you clearly defined your objectives right at the start in your business case, you should now report back to "the management" whether you achieved these objectives or not. And because you made sure you understood the old process (in stage 6.6.2) you will be able to communicate other improvements that have been achieved in the change.

8.12.2 Put in Place Performance Measurement Systems

In order to prevent people lapsing back into old ways, and to guard against lethargy, it is important that you put in place performance measurement systems to monitor the new process.

For further information on performance measurement systems see for example Kaplan & Norton (1992), Neely et al (1995) or Bititci (1995).

8.13 Evaluation of the Methodology

Having developed and presented the methodology we now need to validate it in some way. Ideally the researcher would have like to validate the methodology by testing it out in practice in a number of universities. However, given the length of time it takes to get agreement to proceed with such a project, this was not possible given the constraints on the researchers time. It should be noted however that following the "BPR in UK Universities" workshop hosted by the researcher in December 1997 the researcher has been approached by two universities who are interested in using the methodology and has given a number of presentations to these universities. It is hoped that the projects will go ahead in the near future.

A quicker means of validating the methodology is to seek feedback on the methodology from "knowledgeable persons". Participants in the workshop, and people who subsequently joined the BPR-universities mailbase list (refer to appendices C & D), were called upon to consider the methodology and provide feedback on it. In total 40 practitioners, consultants and academics read the methodology and provided feedback. A list of those involved in the validation of the methodology is included in Appendix E. All of these people were asked to complete a short questionnaire, a copy of which is included in Appendix F. The questionnaire asked people who had read the methodology

whether they believed it met the user requirements set down in Section 8.2. The questionnaire also sought individual comments on the methodology. Feedback from the questionnaires demonstrated that people believed that the questionnaire has met user requirements and that it does represent a practical contribution. Individual comments received through the questionnaire were taken on board by the researcher and fed back into the methodology. Finally, the researcher compared the existing methodologies considered in Section 4.13 with the newly developed methodology to demonstrate the differences between the new methodology and existing methodologies. Appendix G shows this comparison in tabular form.

8.13 Chapter Conclusion

This chapter started by defining our definition of methodology. User requirements were documented. Using the information gained from an extensive literature review and from empirical evidence, methodology design considerations were established, thus forming the basis on which to develop the methodology. A specification was outlined before presenting the methodology itself. The development and validation of the methodology proved our final hypothesis that existing methodologies can be used as a basis for creating a methodology for BPR designed specifically for the context of UK universities.

Having proved all three of our hypotheses set down in Section 1.4 of this thesis, the only thing that remains to be done is to address our final research question (No. 7), namely to analyse and discuss the value of the methodology. This will be done in the next, and final chapter when we consider the contribution made by this work.

CHAPTER 9

CONCLUSIONS

The objective of this chapter is to summarise the conclusions emerging from the research and to assess the significance and value of the work. The limitations of the work are also brought to the fore. The chapter, and indeed the thesis itself, concludes with an analysis of the contribution made by this work, and points to possible future research that could stem from this work. Firstly, however, the chapter starts by considering how the thesis has been advanced.

9.1 Advancing the Thesis

The thesis, i.e. the thing that the researcher has maintained (the story line) is that UK universities need to change in order to survive and that:

- business process re-engineering may provide UK universities with a methodology for change;

- but that the contextual differences between UK universities and business enterprises are so great that existing BPR methodologies couldn't be easily adopted by universities in the UK;

- yet, existing methodologies may be used as a basis for creating a methodology designed specifically for UK universities.

Thus, the thesis has been decomposed into three main hypo-thesis, each of which plays a part in leading towards the final thesis.

Chapter 2 presented sufficient argument to convince the reader that UK universities need to change. The next logical question has to be how can universities change ? The first hypothesis, that business process re-engineering may provide UK universities with a methodology for change was furthered in Chapter 4 when BPR was studied in-depth as a methodology for change. It was suggested that universities could benefit from taking a process view of their organisation and that re-engineering could be employed in UK universities. This argument was concluded in Section 7.2, thus proving the first hypothesis.

But can UK universities simply pick up the existing methodologies for BPR and apply them to the university ? Hypothesis number two contends that they cannot, that universities have certain characteristics that set them apart from other organisations, thus demanding that BPR methodologies be developed specifically for use within this sector. Through presentation of the arguments presented in the literature (Chapters 2 & 8) and by documenting experience of practitioners (Chapters 6,7 & 8) it is hoped that the researcher convinced the reader of the adequacy of this hypothesis.

If the researcher has been successful in convincing readers of the adequacy of the hypotheses thusfar, she will have been successful in advancing both the background theory (the field of business process re-engineering research) and also contributing to the focal theory (the field of higher education management).

The final task of the researcher in advancing her thesis was to prove the third hypothesis, that existing methodologies may be used as a basis for creating a methodology designed specifically for UK universities. This was

done by developing, and seeking feedback on, a methodology for BPR, based on a synthesis of the literature and primary research findings, which could be applied to universities. In so doing, the researcher hopes to have contributed something tangible and of use to the practitioners, as well as advancing current theory and knowledge.

Figure 9.1 outlines the structured approach the researcher took to advancing the thesis.

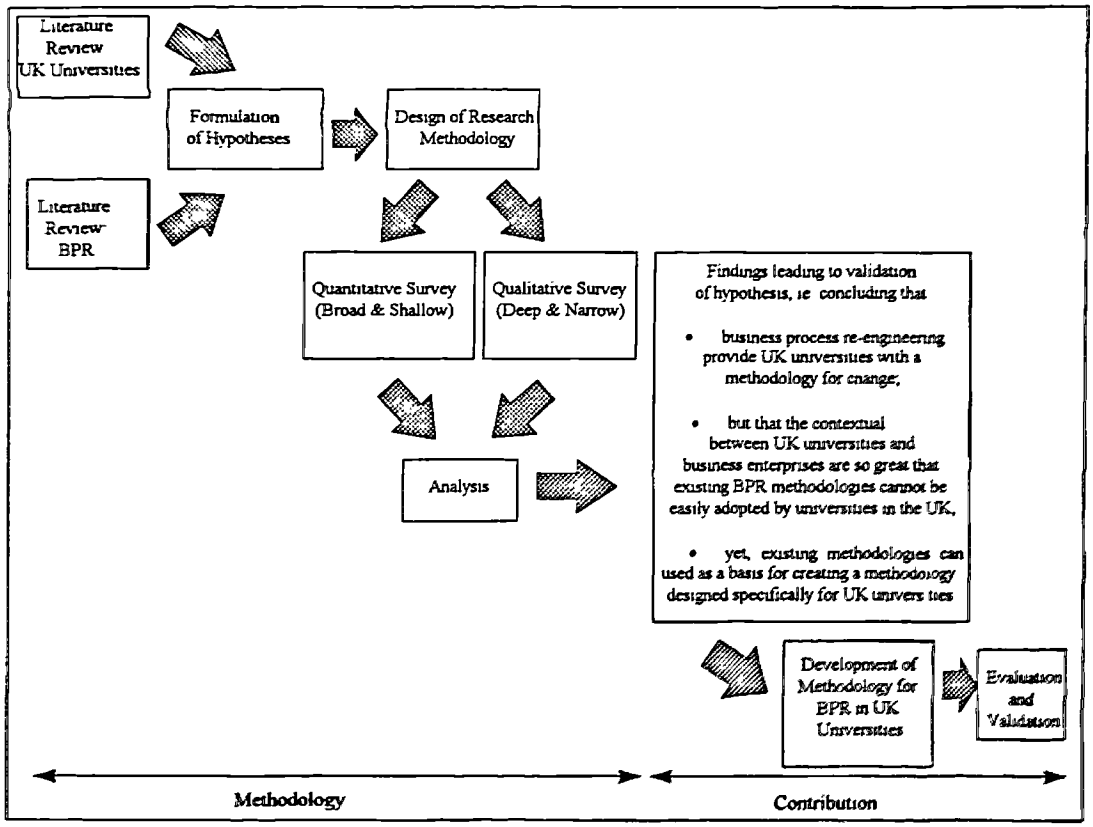

Figure 9.1: Structured Approach Taken By Researcher

9.2 Conclusions

The following conclusions can be drawn from the research documented in this thesis:

- Universities need to focus on business processes as opposed to departments and functions - this is particularly true given the speed of growth in universities in recent years and the need to reduce unit costs (refer to Section 2.6, 2.10 and 7.2 for full discussion).

- Business Process Re-engineering can provide UK universities with a methodology for change (refer to Sections 4.18 and 7.2 for full discussion).

- Initial primary research indicated a significant number of Senior Officers in UK universities considered themselves to be involved in initiatives with a BPR flavour (Refer to Section 5.2.3)

- Closer investigation however revealed that not all of these 'BPR *initiatives' met the criteria established by the researcher* (in Section 4.2) defining BPR projects (refer to Section 7.3 for discussion).

- The contextual differences between UK universities and business enterprises are so great that existing *BPR methodologies can't easily be* adopted by universities in the UK (refer to Sections 2.9, 4.18, 6.8, 7.2 and 8.3 for full discussion).

- There is a real and immediate need for a BPR methodology suitable for use in the UK university context - this fact is borne out by the number of enquiries received by the researcher during the course of this work; by the demand for places at the workshop held in December 1997 and through the number of people - academics, consultants and practitioners alike - who have subscribed to the BPR mailbase list established by the researcher.

- It has been demonstrated that existing methodologies may be used as a basis for creating a methodology designed specifically for UK universities (refer to Chapter 8).

- A methodology for BPR in UK universities has been developed taking account of the contextual differences between UK universities and business enterprises (refer to Sections 8.2, 8.3, 8.4 and 8.5).

- Feedback from "knowledgeable persons" consulted suggests that this methodology represents a contribution to current knowledge and a practical and useful tool for practitioners (refer to section 8.12)

9.3 Contribution to Current Knowledge

The work carried out under this project banner has generated new knowledge that can be summarised as follows:

- a contribution has been made by demonstrating that business process re-engineering can be employed by UK universities to: improve efficiency, effectiveness and value for money; help focus on customer requirements; improve quality; and reduce costs.

- This research project provides the first empirical evidence of process-based change in UK universities. By gathering experiences from those UK universities who have attempted BPR projects, this work provides a reference point for future work.

- A contribution has been made to the field of BPR by extending the work already done and studying BPR in a new context i.e. UK universities

- A contribution has also been made to the field of higher education management - in documenting and advancing a business process view of UK universities

- In effect this research has opened up a new area of academic study i.e. BPR applied to universities

- a contribution has been made by conducting a review of existing BPR methodologies in the light of the contextual differences between UK universities and business enterprises. It was concluded that existing methodologies did not adequately meet the needs of UK universities (Sections 2.10, 4.16 and 8.2)

- A practical contribution has been made through the development of a useable methodology for BPR in UK universities that meets the needs of the sector.

- A further practical contribution has been made by establishing a network of interested parties and facilitating discussion and collaboration.

9.4 Value of the Research to the Researcher

By carrying out this programme of research, the researcher now believes herself to be in full command of the subject of Business Process Re-engineering right up to the boundaries of current knowledge. Armed with this insight into the field of BPR she believes that she has been able to extend the current boundaries of knowledge by taking a step into uncharted waters though analysing and documenting the special case of the application of BPR to universities. In so doing, the researcher has established herself as a specialist in this field. The demand for places at the workshop on BPR in UK Universities in December 1997 demonstrates that academics and practitioners alike are interested in her work. Following the success of the workshop she has also established a mailbase list on the topic of BPR in universities. To date the mailbase has over seventy members. The researcher has also been asked to present a keynote paper at a conference at Staffordshire University in September 1998.

In addition the researcher has also found the process of carrying out research to this level a valuable learning process. It has demanded that the researcher questions and evaluates her own work. Therefore in addition to the new knowledge that she has found, she has also gained valuable research skills which are transferable.

9.5 Limitations

In saying that the research has made a contribution to the field, that is not to say that the research is without its problems and limitations. Being a PhD candidate the researcher has been forced, throughout the period of research and writing up, to critically evaluate her own work, including the research methods and approach taken. The most obvious area where the research is lacking is the fact that the methodology developed has not been employed,

monitored and evaluated in use. The reasons why this was not possible, notably time, were discussed fully in Chapters 7 & 8. Whilst the researcher recognises this to be a serious lacking in the research, it does however offer an opportunity for future research.

9.6 Future Work

As the project progressed, the researcher found tremendous levels of interest from university managers, administrators and academics. There was a special interest in the tools and techniques being employed and the key success factors identified by those who had completed a successful implementation. The following represent areas where further work could usefully be performed:

- development of a workbook-based methodology, encompassing appropriate tools to help UK universities undertake process-based change

- validation of the methodology by implementing process-based change using the methodology in a number of case studies

- development of generic process models of UK universities, similar to the work that has been carried out at Plymouth University in developing generic process models for manufacturing industries.

9.7 A Look Into the Future

This thesis has proposed a methodology for process improvement in universities. In the longer term, however, it is thought that BPR could be

used to help achieve more radical change within the UK higher education sector.

Bridge (1996) in a somewhat idealistic paper, advocates the use of BPR to radically change the face of higher education in this country. He suggests that a radical approach to redesign could result in a situation where the whole process of higher education provision is re-engineered, resulting in knowledge being transferred by means of multi-media packages (supplemented by standard texts) generated by teams of dedicated academics specialising in research and communications with external bodies. These packages would be sent via communications networks to local support centres, tutors and students own residences. Relatively small teams of tutors based at local support centres would then provide academic and learning support. Given this set-up we might find that some institutions might elect to become leaders in tutorial provision at local centres, leaving other institutions to concentrate on research and the production of media to transfer knowledge. Bridge suggests that not only would this lead to cost and efficiency savings, but it would also give students more flexibility by allowing them to chose their own programmes of study, by combining modules in a manner that suits their own requirements - over a period of time that suits them. Further, he suggests that by allowing students the opportunity to pick up modules at their own pace, the distinction between full and part time study would disappear.

The benefits of such radical redesign would likely include quality improvements, including widening access and standardising modules; time benefits to students, allowing them to manage their work and study commitments; cost benefits including more effective and efficient use of resources leading to significant reductions in unit cost. Such radical change however cannot be implemented by individual institutions, it would require backing from government and other stakeholders.

Personally, this researcher is happy to leave the politics and policy debates to others - however it is perhaps fitting to conclude this thesis with a suggestion of future possibilities. It is hoped that the process improvement methodology put forward in this thesis may go some way to moving the sector along the path towards radical change that is needed.

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APPENDIX A

POSTAL SURVEY:
QUESTIONNAIRE & COVERING LETTER

22 May 1997

«Title» «FirstName» «LastName»
«JobTitle»
«Company»
«Address1»
«Address2»
«City»
«PostalCode»

Dear «Title» «LastName»

MANAGING CHANGE IN UNIVERSITIES

I am writing to ask if you can spare five minutes of your time to respond to the enclosed questionnaire, a copy of which has been distributed to senior officers in all UK universities.

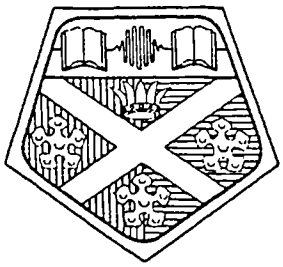
We are all aware of the rapid pace of change in the higher education sector. This survey is part of a larger research programme looking at ways in which UK universities are managing change. The enclosed questionnaire seeks to find out to what extent UK universities are adopting change management tools and techniques developed in other sectors. Business Process Re-engineering (BPR) is one approach, or set of tools, that a number of UK universities have adopted. This questionnaire hopes to measure how prevalent BPR is in the university sector. Further research hopes to identify best practice.

I hope that you can take the time to complete this questionnaire. If not, I would be obliged if you would pass it to a relevant person within your institution for completion.

Should you require any further information please do not hesitate to contact me at the address below. Alternatively you can e-mail me at jillian.macbryde@strath.ac.uk.

Yours sincerely

Jill MacBryde
Senior Associate



UNIVERSITY OF STRATHCLYDE

Managing Change in Universities

This brief questionnaire is part of a research programme looking at change management in universities. The survey's aim is to identify the extent to which universities are adopting change management tools and techniques used in industry to help them organise themselves for a changing environment.

Please read through the questionnaire and answer as many questions as possible the questionnaire should take only five minutes of your time.

Name : _____

Title/Position : _____

University : _____

Please endeavour to return the questionnaire in the envelope provided by 23 June 1997.
Thank You.

Section 1 : Introduction

Q1 To your knowledge, has your university embarked on any kind of Business Process Re-engineering (BPR) activity ?

Yes ☐

No ☐ If you answered **No**, *please go to Question 11*

Section 2 : Universities Who Have Experience of BPR

Q2 Approximately how long ago did you embark on the BPR process ?

Less than 6 months ago ☐

6 - 12 months ago ☐

12 - 18 months ago ☐

18 - 24 months ago ☐

More than 24 months ago ☐

Q3 Who suggested that you consider BPR ?

University Management ☐

Academic(s) in own institution ☐

External Consultants ☐

Other (please state).....

Q4 In what areas of your organisation are your BPR efforts focused ?

university administration ☐

academic faculty ☐

academic department ☐

support service ☐

Other (please state)..... .....

Q5 Have you used the academic expertise within your university to help you with the BPR initiative ?

Yes ☐

No ☐ If you answered **No**, *please go to Question 7*

Q6 In what capacity have the academics been used ? (You may tick more than one box)

In designing the exercise ☐

In modelling the processes ☐

Facilitating workshops ☐

Analysing the data ☐

Making recommendations ☐

Implementing changes ☐

Other (please state).....

Q7 Have you used external consultants ?

Yes ☐ Please Name .....

No ☐ If you answered **No**, *please go to Question 9*

Q8 In what capacity have the consultants been used ? (You may tick more than one box)

In designing the exercise ☐

In modelling the processes ☐

Facilitating workshops ☐

Analysing the data ☐

Making recommendations ☐

Implementing changes ☐

Other (please state).....

Q9 How would you class the improvements you have made/or hope to make ?

Radical ☐

Incremental ☐

Q10 Who is leading the BPR team ?

Name .....

Title .....

Please go to Question 14

Section 3 : Universities Without BPR Experience

Q11 Has BPR been discussed at a management level within your university?

Yes ☐

No ☐

Q12 Is your university considering embarking on a BPR exercise in the foreseeable future ?

Yes ☐

No ☐

Q13 Are you aware of any other UK universities undertaking BPR activities ?

Yes ☐ Please Name .....

No ☐

Section 4 : Further Information

Q14 Would you be interested in hearing more about this research programme and receiving a copy of the results of this survey ?

Yes ☐

No ☐

Thank you for your time.

APPENDIX B

AGENDA FOR INTERVIEWS

Agenda

Introduction to Research

Results of Postal Survey

Your University

- Why ?
- How ?
- Problems & Barriers
- Success Factors

Questions

Interview Checklist

(not shown to interviewees - but used as a prompt for interviewer)

- What factors made you decide it was time to change (eg. competition, financial/cost saving, always looking for ways to improve etc.) ?
- What do you see as being the critical success factors/strategic differentiators for universities in the next ten years ? (eg. flexibility, low cost, quality etc.)
- Was the decision to focus on processes based on the university's strategy ?
- Do you believe that BPR can work in the University sector as well as it is suggested it has worked in the manufacturing and services sectors ? ie. Did it work.
- Do you think that universities have special characteristics that make them a special case ? What makes universities different ?
- Do you think that some universities are more suited to undertaking a BPR project than others ? Why - readiness to change, management, structure, technology ?
- Discuss BPR methodologies with the person and try to find out what stages they went through and where the problems lay etc. I also want to probe if they have undergone any other type of change exercise eg. TQM
- How have people reacted to the change ? How has this been handled ?
- Have you assigned individuals or created special roles for overseeing processes ? Use of teams etc.
- Do you think that the process approach calls for a different type of manager ?
- Do you see BPR as being a one off exercise in your institution ?
- As you reflect on the changes you have described, what advice would you offer other VCs about to embark on the same path ?

APPENDIX C

BPR IN UK UNIVERSITIES WORKSHOP
12 DECEMBER 1997

«Title» «FirstName» «LastName»
«JobTitle»
«Company»
«Address1»
«City»
«PostalCode»

5 November 1997

Dear «Title» «LastName»

BUSINESS PROCESS RE-ENGINEERING IN UK UNIVERSITIES
WORKSHOP : 12 DECEMBER 1997

Many of you will be aware of the current research into the Management of Change in UK Universities currently being undertaken at Strathclyde University. Some of you will have responded to questionnaires, others may have given generously with their time.

In recent months research has focused on Business Process Re-engineering (BPR) in UK universities. With this phase of the research nearing completion, we now wish to share with you some of our findings. To this end we write to invite you to a one day workshop at the University of Strathclyde. This event will provide us with an opportunity to thank you for the time you have given and will also provide delegates with an opportunity to share experiences.

Enclosed is a draft programme for the day, together with a registration form. We would be grateful if you could return the completed registration form by 1 December in order that we can make the final arrangements. There is a small charge of £35 to cover the cost of the event. This can either be paid by post with your registration or on the day of your arrival. All cheques to be made payable to "University of Strathclyde".

We have chosen to start the event at 11.00am to allow people to travel to Glasgow. However, should you wish overnight accommodation then please contact me on 0141-548 4549 with your requirements.

I do hope that you will be able to join us for what promises to be an informative and interesting workshop.

Yours sincerely

Jill MacBryde
Senior Associate

BUSINESS PROCESS RE-ENGINEERING IN UK UNIVERSITIES
WORKSHOP : 12 DECEMBER 1997

Programme

10:45	Coffee & Registration	
11:00	Welcome/Aims of the Workshop	
		Jill MacBryde
		University of Strathclyde
11.10	What are Business Processes ?	
		Dr Umit Bititci
		Centre for Strategic Manufacturing
11.30	An Overview of the "Managing Change in UK Universities" Project	
		Jill MacBryde
		University of Strathclyde
11:50	BPR of Administration Processes : A Case Study	
		Dr Robert MacIntosh
		University of Glasgow
12:10	BPR in the University Environment	
		Claire Matterson
		Coopers & Lybrand
12:30	Lunch	
13:30	BPR of Support Processes : A Case Study	
		Dr Ken Edwards
		University of Leicester
13:50	The Human Issues of BPR in Universities	
		Bernard Paton
		University of Northumbria at Newcastle
14:10	Syndicate Sessions	
14.45	Coffee	
15:00	Feedback	
15:30	Panel Discussion	
16:00	Summary and Close	

BUSINESS PROCESS RE-ENGINEERING IN UK UNIVERSITIES
WORKSHOP : 12 DECEMBER 1997

REGISTRATION FORM

Name _____

Position _____

Organisation _____

Address _____

Tel No. _____ Fax No. _____

Email _____

Please indicate how you intend to pay

I enclose a cheque for £35 ☐

I intend to pay on arrival ☐

Any special requirements for lunch ? _____

I would like to raise the following questions for discussion

1. _____

2. _____

Either **Fax** to Jill MacBryde, University of Strathclyde on Fax No. 0141-552 0557
or **Post** to Jill MacBryde, Department of Design, Manufacture & Engineering Management, University of Strathclyde, 75 Montrose Street, Glasgow G1 1XJ

DELEGATE LIST

Name		Designation	Company/University
Claire	Matterson		Coopers & Lybrand
Sarah E.	Chiodetto	Faculty Registrar (Science & Technology)	Glasgow Caledonian University
John	Poulter	Consultant	John Poulter Consultancy
Susan	Taylor	Planning Assistant	Liverpool John Moores University
Michael H.	Pearson	Bursary & Finance Officer	Loughborough University
Richard	Weston	Head of MSI Research Institute	Loughborough University
Edward	Angus	Business Director	Napier University
Steve	Rowett	Consultant Analyst	PA Consulting Group
Stephen	Hill	Research and Projects Officer	Robert Gordon University
Daniel	Batts	Industry Manager	Sap (UK) Ltd.
Susan	Gill	Senior Assistant Registrar	Sheffield Hallam University
Peter	Hartley	Head of Dept - Cultural Studies	Sheffield Hallam University
Tina	Theis	Director, Process Improvement Programme	Staffordshire University
Paul	Boardman	Process Improvement Programme Team	Staffordshire University
Edward	Fordham	Process Improvement Programme Team	Staffordshire University
John	Rogers	Strategic Planning Officer	University of Aberdeen
Bill	Walmsley		University of Central Lancashire
Hazel	Glover	Operations Manager	University of Derby

David R.W.	George	Deputy Secretary	University of Dundee
M.J.	Johnson	Head of Procurement	University of Durham
Julie	Turner	Change Manager	University of Durham
John	Espiner	Internal Auditor	University of Glasgow
Robert	MacIntosh	Lecturer	University of Glasgow
Gordon	Doughty	Senior Lecturer, Director	University of Glasgow
Richard	Bunce	Deputy Head, Management Services	University of Hertfordshire
Fen	Arthur	Deputy Vice-Chancellor	University of Huddersfield
Andrew	Paterson	Research Fellow	University of Kent
Michael F.	Fuller	Senior Lecturer	University of Kent
Ursula	Fuller	Dean of the Science, Technology and Medical Studies Faculty	University of Kent at Canterbury
Ken	Edwards	Vice-Chancellor	University of Leicester
Nosa	Evbuomwan	Lecturer in Structural Engineering	University of Newcastle
Bernard	Paton	Director of Personnel	University of Northumbria at Newcastle
Keith	Vary	Project Manager	University of Northumbria at Newcastle
Tony	Osborne	Associate Director (MIS)	University of Stirling
Bill	Sutherland	Director of Personnel	University of Strathclyde
James	McSheaffrey	Procurement Officer	University of Strathclyde
Elaine	O'Brien	Dept. of Marketing	University of Strathclyde
Susan	Bridgeford	Assistant Registrar	University of Strathclyde

Maggie	Sheen	Director of ETRAC	University of Strathclyde
Jackie	Newlands		University of Strathclyde
Fiachra	Coll	Researcher	University of Strathclyde
Ken	Pandya	Lecturer	University of Strathclyde
Jill	MacBryde	Senior Teaching Associate	University of Strathclyde
Umit	Bititci	Senior Lecturer	University of Strathclyde
Allan	Carrie	Professor of Advanced Mfg Systems	University of Strathclyde
David	Newall	Director of Planning	University of Strathclyde
Hugh	Livingston		University of Strathclyde
David	Muckersie	Planning Officer	University of York
Carol	Norfolk	Senior Assistant Finance Officer	Warwick University

APPENDIX D

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Total members 74

APPENDIX E

PRACTITIONERS, CONSULTANTS AND ACADEMICS WHO CONTRIBUTED TO THE VALIDATION OF THE METHODOLOGY

PRACTITIONERS, CONSULTANTS AND ACADEMICS WHO CONTRIBUTED TO THE VALIDATION OF THE METHODOLOGY

Rose Cooper
MAIS Finance Project Team
University of Newcastle

David Muckersie
Planning Officer
University of York

S.A. Latham
Assistant Planning Officer
University of Surrey

Shirley Blackmore
Head of MIS
Nottingham Trent University

Dr Daxa Patel
Principal Lecturer
De Montford University

Dr Stephen Hill
Projects Officer, Principal's Office
Robert Gordons University

Clare Le Fevre
Consultant
PriceWaterhouseCoopers

Steve Rowett
Consultant
PA Consulting Group

Tony Hoe
Consultant
AIMS, University of Liverpool

Reg Aldridge
Manager, Centre for IT in Industry
Staffordshire University

Andrew Higgins
Deputy Academic Registrar
University of Greenwich

David Marsh
Administrative Computing Manager
University of Greenwich

Sophie Leach
Policy Support Officer
University of Birmingham

Susan Bridgeford
Assistant Registrar
University of Strathclyde

Mr Frank Lynch
Management Services Division
University of Glasgow

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Senior Assistant Registrar
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Marie Salter
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SAP (UK) Ltd.

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Sales Manager
Dolphin Computer Services

Richard Bunce
Management Services
University of Hertfordshire

Jenny Beattie
Assistant Faculty Officer
University of Strathclyde

Mike Sparks
Research Grants
University of Edinburgh

A. B. Macdonald
Assistant Faculty Registrar
Glasgow Caledonian University

Dr John Rogers
Strategic Planning Officer
University of Aberdeen

Nicholas Bowry
Senior Personnel Officer
The University of Edinburgh

Prof. Peter J. Hicks
Vice-Principal (IS Strategy)
UMIST

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Senior Partner
Coopers & Lybrand, London

Alison Ansell
Senior Assistant Bursar
University of Reading

K. M. Rabey
School of Computing
Staffordshire University

Antony Bryant
Professor of Informatics
Leeds Metropolitan University

Maria Vakola
Lecturer
University of Salford

John McGarry
Manager
Deloitte & Touche, Dublin

P. John
University of Glamorgan

Julie M. Toner
University of Durham

Hazel Glover
University of Derby

K. R Kellard
University of Central Lancashire

APPENDIX F

SAMPLE FEEDBACK FORM USED FOR VALIDATING THE METHODOLOGY

UNIVERSITY OF STRATHCLYDE

Methodology for Business Process Re-engineering in UK Universities

Feedback Form

Thank you for your interest in the methodology which I emailed to you some days ago. I would be very grateful if you could now provide me with some feedback by completing this short questionnaire. As you will have gathered, the methodology forms part of my work for my PhD so your comments are appreciated.

Name : ALAN MACDONALD

Title/Position : ASST. FACULTY REGISTRAR

University/Company : FACULTY OF BUSINESS
GLASGOW CALEDONIAN UNIVERSITY

1 **Does the Methodology Meet User Requirements ?**
At the outset a number of user requirements were established. These are listed below. Can you please indicate how well you think the methodology meets these objectives by placing a tick in the box you think most appropriate.

(i) The methodology takes into account the peculiarities of the university situation

Fully	Reasonably	Partially	Not at all
☐	☑	☐	☐

(ii) The methodology uses the experiences of others in similar projects

Fully	Reasonably	Partially	Not at all
☑	☐	☐	☐

(iii) The methodology is flexible and can be used on both large and small scale projects

Fully	Reasonably	Partially	Not at all
☑	☐	☐	☐

(iv) The methodology can be quickly and easily picked up by the re-engineering team

Fully	Reasonably	Partially	Not at all
☑	☐	☐	☐

2 To what extent to do think the methodology provides a practical and useful tool for practitioners wishing to undertake Business process Re-engineering in UK universities?

Extremely useful	useful	of interest	no use at all
☑	☐	☐	☐

3 Any further comments.

Jill,

I would suspect that universities suffer from lack of leadership. The pluralistic nature of the university means that leadership is decentralised, with the strengths of any university lying in its academic departments. It is perhaps the strengths of individual leaders, from Vice-Chancellor downwards, that is important. Universities are also operating with a dual management approach, namely the traditional collegial (committees) versus the executive management style (lack of consultation). They probably are one or the other, as the situation dictates. As you rightly point out, universities are facing greater and greater accountability (RAE, QAA, etc) and I'm sure your work on processes will prove to be very useful in this regard.

Thank you for your time.

Please return the questionnaire in the envelope provided

Ms Jill MacBryde, Department of Design, Manufacture and Engineering Management
University of Strathclyde, 75 Montrose Street, GLASGOW G1 1XJ

APPENDIX G

COMPARISON OF DEVELOPED METHODOLOGY AGAINST EXISTING METHODOLOGIES

Existing Methodologies
vs
The BPR in UK Universities Methodology

The question of how the BPR in UK Universities Methodology differs from other methodologies is clearly answered by comparing fourteen of the most commonly sighted methodologies (as outlined in Section 4.13) with the newly developed methodology. It was concluded that the newly developed methodology has unique features that take into account the user requirements documented in Section 8.3

Newly Developed Methodology	**Existing Methodologies (Refer to Section 4.13 for detail)**													
Steps in Methodology	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
Identify Opportunity/Need for Re-engineering	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
Develop and Sell Business Case	X	X	✔	✔	X	✔	X	X	X	✔	X	X	X	X
Communicate	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
Build and Train the Team	X	X	X	✔	X	X	✔	✔	X	✔	✔	X	X	✔
Detailed Plan & Responsibilities	X	X	✔	✔	X	X	✔	X	X	✔	✔	X	X	X
Identify Customer/ Stakeholder Requirements	✔	X	X	X	✔	✔	X	✔	X	✔	X	✔	✔	✔
Model Processes	X	X	X	X	✔	✔	X	X	X	✔	✔	X	✔	X

Newly Developed Methodology	Existing Methodologies (Refer to Section 4.13 for detail)													
Steps in Methodology	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
Identify Value Adding Activities	✔	✔	✔	X	X	✔	X	✔	✔	✔	✔	X	✔	✔
Identify Duplication & Waste	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	X
Simplify Processes	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
Identify Where Technology Can be Used	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
Gain Consensus & Support	X	✔	✔	X	✔	✔	X	X	X	✔	✔	X	X	X
Identify Training Requirements	X	X	X	X	X	✔	✔	X	X	X	X	X	X	X
Define New Working Procedures	X	X	X	X	X	X	X	X	✔	✔	X	X	X	X
Specify Job Changes & Team Roles	X	X	X	X	X	✔	X	X	X	✔	X	✔	X	X
Design Change Management Programme	X	X	X	X	X	✔	X	✔	✔	✔	X	X	X	X
Plan Implementation	X	X	✔	✔	X	✔	X	X	X	✔	X	X	X	X
Train Staff	X	X	X	✔	X	✔	✔	✔	X	✔	✔	✔	✔	X

Newly Developed Methodology	Existing Methodologies (Refer to Section 4.13 for detail)													
Steps in Methodology	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
Pilot Redesign Process & Seek Feedback	X	X	✔	✔	✔	✔	X	X	✔	X	✔	X	✔	X
Refine	X	X	✔	✔	✔	✔	X	X	✔	X	✔	X	✔	X
Full Scale Implementation	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
Measure Performance Improvements & Communicate Benefits	✔	X	X	✔	X	X	X	X	X	X	X	✔	✔	✔
Put in Place Performance Measurement Systems	✔	X	X	✔	X	X	X	X	X	X	X	✔	✔	✔