

PROJECT MANAGEMENT: USES, STRUCTURES, SYSTEMS AND INFLUENCES

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ABSTRACT

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Parts of the project management literature theorise that there have been changes in the use of project management. The changes they describe include an increase in the applicable work areas for projects, an increase in the use of project team structures, a broadening of the conceptual base of project management and a new strategic role for projects in organisations. Theories also suggest that, as the use of project management changes, organisations develop project management-related structures and systems. This study investigates the extent to which the theoretical developments described in the literature exist in practice and, where they do exist, investigates their character. The study also investigates the extent to which the project management practices vary depending upon factors linked to the wider organisation environment.

The subjects were 63 employees from 22 organisations. Purposive, heterogeneous sampling was used to ensure diversity in the business sectors and characteristics of the organisations chosen and in the jobs and project involvement of the subjects. All participants completed an interview-administered questionnaire, developed to collect data of attitudes, opinions and experiences relating to the uses of project management and project management-related structures and systems.

The survey results show that the increased use of project management is primarily characterised by the development of project team working and less so by an enhanced strategic role for projects or a greater adoption of formal project management methods. Whilst there is evidence of widespread agreement that project management is an applicable tool for managing all types of business change, current uses of project management still focus on traditional areas, such as meeting time, cost and quality objectives, rather than newer areas, such as facilitating innovation and creativity. The investigation of project management-related structures shows many situations in which structures to support project management, such as structures for the strategic co-ordination of multi-projects and for the centralised support of project work, are absent. This absence confirms previous studies that highlight the problems of establishing business structures to support the development of project management in organisations. The results relating to project management systems confirm previous work that highlights the importance of stakeholders and activities both upstream and downstream of the project life cycle. But the survey did highlight possible mismatches between theory and practice, for example in terms of the evolution of project management systems, which suggest possible theory modification.

The comparison of different opinions, attitudes, behaviours and experiences, particularly between subjects working in organisations with a traditional focus on project work and subjects in organisations with no such focus, provides information about the potential character of best practice. This information will be useful to organisation as they increase their focus on projects and, hence, look to make more use of project management.

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CHAPTER 1

INTRODUCTION

In this study I attempted to investigate the uses of project management and the structures and systems developed to support the management of projects.

Parts of the project management literature describe developments in each of these areas, yet, in most cases, there is an absence of empirical study of the extent to which the theories match existing project management practice. For example, the writings of Cleland (1994), Fangel (1993) and Kerzner (1994) theorise that there have been changes in the use of project management. The changes they describe include an increase in the applicable work areas for projects, an increase in the use of project team structures, a broadening of the conceptual base of project management and a new strategic role for projects in organisations. The theories also suggest that, as the use of project management changes, organisations develop project management-related structures and systems.

Where research has been undertaken, it is often limited in terms of the area of investigation. For example, surveys report the existence of structures and systems, but they either focus on a small number of case studies or do not explicitly investigate a range of organisation environments. For example, Chaffey (1997) reports the results of a survey of structures and systems associated with project-focused environments, but does not indicate the number and types of organisation sampled.

The limitations in terms of the amount, and scope, of empirical study, into project management uses, structures and systems, outlined above, suggest that it is a worthwhile topic for study. The limitations also provide two broad areas of focus for the study.

The first area of focus is an investigation of the extent to which theoretical developments in project management exist in practice and, where they do exist, an investigation of their character. This requirement forms the basis for the development of a number of research questions in the areas of project management uses, structures and systems.

The second area of focus is an investigation of the extent to which project management practice, whether it is consistent with existing theory or not, is influenced by factors associated with the business, organisation and work environments in which projects are carried out. This requirement forms the basis for the development of research hypotheses linked to the research questions. It also suggests the need for a study of subjects from a diverse range of organisation and project environments.

The development of a research strategy and choice of research method aims to ensure that, in the investigation, the requirements of both areas of focus are met.

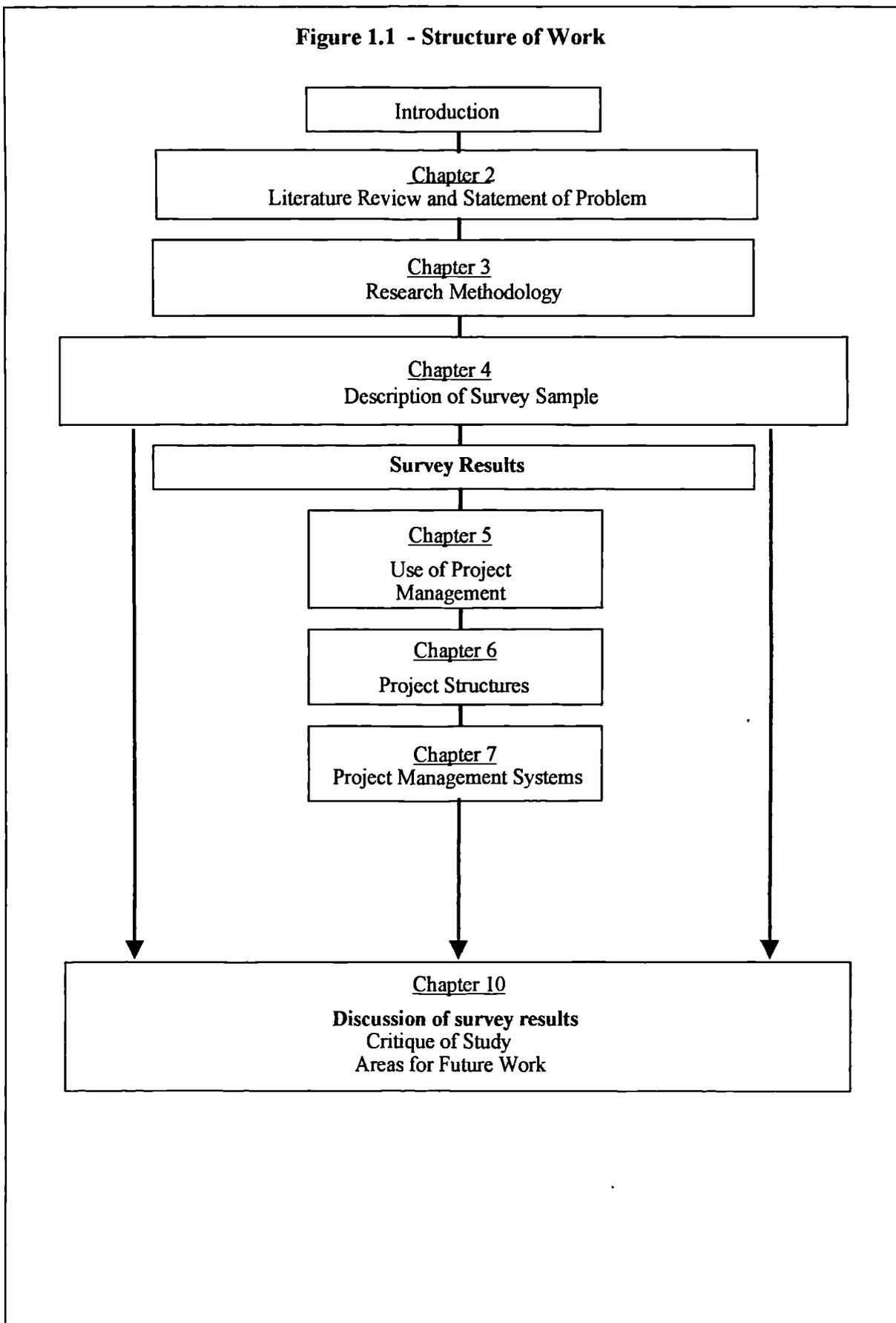
In terms of the structure of work, the investigation takes the form shown in Figure 1.1.

A literature review and Statement of the Problem is contained in Chapter 2. The literature review provides the necessary in-depth understanding of theories and concepts relating to the broad areas of investigation. The literature review also provides confirmation of the absence, and limitations, of previous studies. The review of the literature leads to the development of a number of research questions and research hypotheses in the Statement of the Problem, which concludes the chapter.

Chapter 3 builds on the material presented in Chapter 2 and details the approach adopted in terms of investigating the research questions and hypotheses detailed at the end of the previous chapter. In particular, a diverse range of subjects are required in order to investigate the influence of the business environment, the organisation characteristics and the work environment on issues associated with project management. In Chapter 3 a set of matrices are developed that ensure such diversity in the sample of subjects selected for study. Chapter 3 also details the research method adopted for the investigation. This includes information about the choice of a survey as the overall research strategy. It also details the design of the questionnaire and the sampling methods used. Decisions made about a suitable research method are justified by reference to established theory.

The survey results, in terms of the characteristics of the sample, are presented in Chapter 4. These results confirm the diversity of subjects as planned for in the preceding chapter.

Figure 1.1 - Structure of Work



The different business sectors represented are detailed and different organisation characteristics presented include organisation status, project-focus, corporate membership of The Association of Project Management and whether the organisation is a supplier of a manufactured product or of a service. The survey results in Chapter 4 also show diversity in a subject's environment through the existence of different functions, project roles, type of project work undertaken and project management experience.

In Chapters 5 – 7, the survey results are presented. Chapter 5 contains the survey findings relating to the uses of project management. Chapter 6 covers the area of project management-related structures. Whilst Chapter 7 presents the results relating to the existence and character of project management-related systems. The three chapters document the outcomes from the statistical methods used to test the various research hypotheses. Testing of the research hypotheses allows conclusions to be drawn as to the potential influences on various elements of project management practice.

Chapter 8 contains a discussion of the survey results reported in Chapters 4 – 7. The results are discussed in the context of addressing the research questions. The chapter also shows how the results confirm or contradict the literature and, where appropriate, makes suggestions regarding the possible modification of existing theory. The chapter also draws together the main conclusions from Chapters 5 – 7 relating to the influences on project management uses, structures and systems. The chapter concludes with a critique of the study and suggested areas for further work.

CHAPTER 2

LITERATURE REVIEW AND STATEMENT OF PROBLEM

2.1 Introduction

The overview of the research problem contained in Chapter 1 suggests the following three broad areas for further investigation: the use of project management in organisations, the structures established to manage projects and the project management systems in existence. This chapter provides a review of the literature in each of these three areas. The chapter concludes with the Statement of the Problem. The Statement of the Problem contains the research questions and research hypotheses that are addressed in the remainder of this thesis.

2.2 Use of Project Management

2.2.1 Development of Project Management

In recent years the project management literature has contained descriptions of an increase in the use of “project management”. The following broad developments are identifiable: an increase in the applicable work areas for projects, an increase in the use of project team structures, a broadening of the conceptual base of project management, a new strategic role for projects in organisations (Cleland 1994, Fangel 1993, Hayden 1997, Kerzner 1994). These developments are described in academic colloquies and personal reflections which, whilst drawing upon a wealth of personal experiences, do not refer to any specific empirical studies to confirm the existence, or the nature, of the developments described.

An implicit assumption in the academic colloquies and reflections cited in the previous paragraph is that the developments are inter-linked. The academic colloquies of Cleland (1994) and Kerzner (1993) describe the main development as an increase in the use of cross-functional project teams, but, to support the workings of such teams, this increase leads to a greater use of project management methods, tools and techniques. In addition, as organisations use such teams more extensively and “non project-focused” organisations use them for the first time there is a broadening of the areas of work in which project management is viewed as an applicable management tool.

Descriptions of a new strategic role for projects imply similar inter-linked changes in the use of project management. As the management of projects becomes a strategic issue, project management focuses on the integration, prioritisation, communication and continuous control of multiple projects (Hayden 1997). Such a change of focus leads to the development of enterprise-wide structures and systems, rather than the project-wide structures and systems developed in environments where projects have a tactical role rather than a strategic role in the organisation.

A review of the literature reveals one study specifically relating to the developments described above. The study, reported by Chaffey (1997), considers the extent to which organisations have developed project team structures and systems to support an increased strategic focus on project work. Although presenting the results of a survey amongst British businesses, the report provides no indication of the number and characteristics of the organisations sampled. Nor is there included any discussion of the theoretical framework for the research and the research design and methodology employed.

The literature does not report the results of any empirical research, for example in the form of a longitudinal study, putting the developments in project management described so far in a historical context. Again, this results in a reliance on personal perspectives. The most pertinent writing on this subject is that of Kerzner (1994). Kerzner identifies two main factors influencing developments in the use of project management.

The first factor is the type of organisation. Project management develops quicker and easier in traditional project focused organisations. In non-project focused organisations it is likely to take root in a project-driven function, such as Information Technology, and then grow out into other functional areas. This suggests that the development of project management is partly a function of the inherent nature of the work undertaken.

The second factor is the external trigger of recession. Recessions are the single major force enhancing maturity and acceptance of project management, especially in non-project focused organisations. The assumption is that in times of recession, organisations are under greater pressure to meet customer requirements and faced by greater competitive pressures than during other periods. Kerzner analyses the influence of recession by

comparing the US recessions of 1979-82 and 1990-94. There was little acceptance of an increase in the use of project management in 1979-82, mainly because solutions to the recession focused on short-term cost cutting activities. Organisational maturity in the use of project management increased during the 1990-94 recession as the focus of solutions to the recession was now on longer-term initiatives. This change of focus explains why some organisations are able to develop their use of project management whilst others are not.

The belief that there are no quick, short-term ways of effectively increasing the use of project management in an organisation suggests a possible similarity between the development of project management and the development of quality management.

The link between project management and the development of Total Quality Management (TQM) in organisations is analysed in some literature sources. However, this analysis does not relate to the presentation and discussion of research data specifically obtained to investigate this issue. Rather, it is based on an interpretation of the reasons for the success and failure of a number of organisations in the US since the early 1970's.

Kerzner (1994) cites the case of Johnson Controls, an organisation that embarked on an aggressive TQM programme in 1986. In 1987 they recognised a "marriage" between TQM and project management, based initially on the contribution of project management to improving the implementation of TQM programmes. Kerzner also briefly expresses the view that TQM contributes to the marriage by creating a culture in which project management will be accepted at accelerated rates, though no specific details of the processes involved are provided. Similar conclusions are drawn from an analysis of the experiences of companies such as Ford Motor Company, Motorola and Hewlett Packard (Stamatis 1994). In addition, Stamatis describes project management and TQM in terms of complimentary and dovetailing processes.

Comparisons between the disciplines of project management and quality management may help in establishing the factors influencing developments in the use of project management. The discussion in this section has identified the possible influence of the "external" factors of customer requirements and competition. These factors are also identified as important in providing a motivation for the use of quality management

methods (Lascelles and Dale 1993). Lascelles and Dale draw their conclusions from a research study of 462 organisations, providing particularly reliable and valid data. In addition to the external factors of customer requirements and competition, Lascelles and Dale highlight the important role of “internal” factors, such as the role of senior management, a re-start situation or a greenfield venture.

2.2.2 Importance of Project Management

The literature describing an increase in the use of project management also contains details of how the importance of project management to organisations is increasing. Implicit in the detail is the belief that the importance of project management can be measured by considering the value of projects to the organisation. The greater the focus on project work, the greater the value earned by projects.

On this basis three types of project-focused organisations are identified (Firth 1995). Those in which projects earn the most value, proportionally to all types of work, and hence “make or break” the organisation, such as management and engineering consultants, lawyers, property developers, construction companies and heavy engineering companies. Those in which projects have “an enormous impact” on the success of the organisation, such as R&D and new product groups, pharmaceutical and manufacturing companies. Finally, those in which projects are becoming “an increasingly important component” of the organisation’s immediate and long-term success. In the last type of organisation projects are an applicable vehicle for managing all types of work, so the applicability of project management as a method for managing activities is not dependent on the type of work, as is the case in the other two types of organisation.

These descriptions of types of organisation, based on the importance of projects and project management, do not draw upon empirical research. Firth, for example, makes general conclusions in the context of the work of the UK Defence Research Agency, but does not explicitly discuss the number and types of organisation surveyed by the agency. Neither does the literature provide the results of longitudinal studies, necessary to validate any claims of an increase in importance of project management. The descriptions also suggest a degree of homogeneity across an organisation and a consistently upward rate of change in terms of the importance of projects and project management.

2.2.3 Scope of Project Management

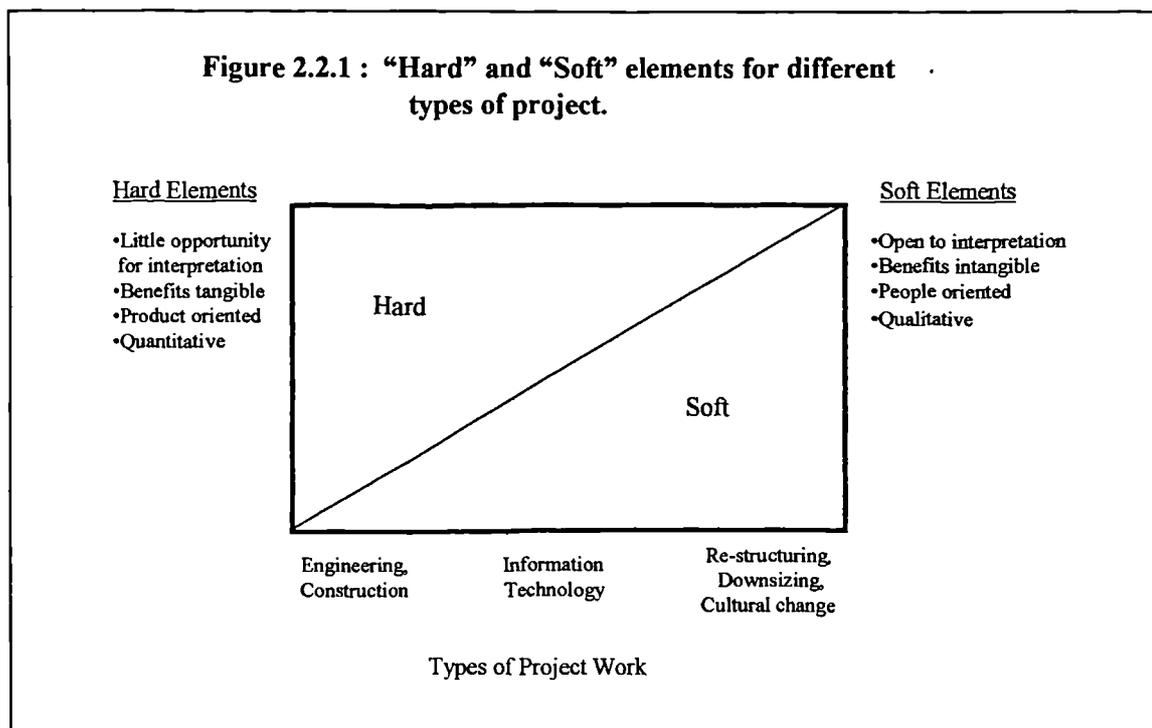
The literature testifying to the development of project management further describes how the scope of project management broadens, leading it being used to manage all types of change in an organisation. New areas of application for the utilisation of project management methods, techniques and tools are claimed, such as mission and strategy setting, business process re-engineering, education and training and re-structuring (Dawson 1995). Though, rather than being based on empirical study, many of the claims are made by management consultants interested in propagating the use of project management in organisations as a way of gaining new business.

The broadening of the scope of project management suggests a new emphasis in terms of definitions of a project. Traditional definitions of a project derive from the inherent characteristics of a project that distinguish it from a normal operations, with projects used to deliver the output from unique, mainly capital-intensive, work activities. Other definitions in the literature stress the role of projects in introducing change within an organisation. For example, in broadening the scope of project management in the TSB, the organisation's definition of project was re-stated as "a vehicle for tackling business-led change within an organisation" (Lane 1993). Similar definitions appear elsewhere in the literature (Dawson 1995, Pellegrinelli & Bowman 1994, Turner 1993b). This broader definition of a project is presented in the context of a generic project environment, with the literature containing no studies of the influence of the characteristics of an organisation, or the type of work undertaken, on its acceptance amongst industry practitioners.

The role-based definition of a project, stated by Lane and others, provides a rationale for the development and increased use of company-wide project management structures and systems. Projects are a strategic tool in organisations looking to manage all types of change. They become components within a wider "programme", where a programme is "a framework for grouping existing projects or defining new projects, and for focusing all the activities required for achieving a set of major benefits" Pellegrinelli (1997). There may be different types of programmes. For example, a programme of "development" projects which arise from a business strategy, or a programme of "change" projects, which is related to improving the way organisations carry out business (Levene & Braganza (1996). Regardless of the type of programme present, in response to this new role for projects the

project management structures and systems have to be able to deal with the management of both the individual projects and the wider programme. This requires a holistic approach to project management (Abrathat 1994).

A widening of the scope of project management can also be considered by referring to the inherent characteristics of the project work undertaken. A useful dichotomy is “hard” projects and “soft projects” (Dawson 1995). The characteristics of both project types are shown in Figure 2.2.1. Traditional projects are product-oriented, have clearly understood requirements, tangible benefits and easily quantifiable objectives. As the use of project management broadens it is used to manage not just traditional projects, but also the management of all business change (often through programmes or portfolios of projects). These new project areas are often people-oriented, have unclear requirements, intangible benefits and qualitative objectives. In some cases, such as the introduction of Information Technology, the work being undertaken may involve characteristics of both "hard" and "soft" projects (Trapp 1993).



Source: Dawson (1995), Trapp (1993)

2.2.4 Features of a Project Environment

An increase in the use of project management, as described in the literature, is accompanied by descriptions of the development of features of the project environment, as distinct from the traditional, hierarchical, functional environment.

Project environments are described as being organised around one-off tasks and as being particularly strong in volatile and changing environments. The literature contains suggestions as to the features that characterise these project environments and, therefore, distinguish them from traditional operations environment. For example, Firth & Krut (1991) provide a fourteen-point list of characteristics of a traditional line management environment compared with a project management environment. Their list covers such areas as the types of meetings, the information flows, the types of control and the nature of the relationship between customers and suppliers. The claims made by Firth & Krut are based on their own observations of organisations, through their involvement in a management consultancy and research company, though there is no indication of the number or types of organisations on which they base their conclusions. Nor is there an indication of the extent to which different characteristics in their fourteen-point list may be absent or present.

There are examples in the literature of attempts to group features of a project environment. These groupings include tangible and intangible elements. A project environment consists of “hard” tangible elements: “routines and procedures”, “reward and control systems” and “organisational structure” and “soft” intangible elements: “stories and myths”, “symbols” of rank and status, and informal and formal “power structures” (McElroy 1995). Alternatively, it consists of features under the headings: “physical appearance”, “myths/stories”, “ceremonies” and “management style” (Milosevic 1990). Milosevic bases his conclusions on a longitudinal study of a large, multinational construction company, though there is a lack of research into the extent to which conclusions, based on the study of a few organisations, are valid across a larger, and more diverse, number of organisations.

A common theme in descriptions of the features of project environments is the way the relationship between different various project stakeholders, including external customers,

internal customers, external suppliers and internal suppliers is managed. As documented in a number of case studies, this relationship is often complicated by the existence of different cultures in different stakeholder's environments. A case study, reported by Levasseur (1993), discusses the management of a project to introduce a new inventory system into a computer manufacturer. The case highlights the fact that a fit between the culture of the organisation receiving the project "solution" and the "solution" itself is necessary for project success. Furthermore, it identifies the problem of managing different cultures in different parts of the organisation. For example a different culture existed in Head Office in comparison to the regional field service offices. As such, an understanding of the cultures in which a project is being carried is a critical project success factor.

An ethnographic field study of a manufacturing automation project at Apple Computer, Inc., by Dubinskas (1993), uses the engineering and technology management literature to develop models for the management process in engineering project environments. Based on his study of this project he proposed two contrasting metaphors as models of the management process. The first model is the "funnel". The funnel represents control, with the objective being to "...eliminate competing ideas, set specifications, and control the process to completion, always guarding against change." The second model is the "fermentation vat". The fermentation vat represents a more chaotic approach. It is characterised by "...continuous idea generation, tolerance for ambiguity and change, and late or emergent specification of details."

The adoption of the fermentation vat is proposed as the best model for dealing with the inherent uncertainty of the development process for the type of project studied. The choice of model impacts on the methods employed for managing the project team and for handling the customer/supplier relationships. Selection of the fermentation vat gives the project team a high degree of autonomy, managerial restrictions are minimised and open two-way partnerships with customers and suppliers exist.

As with the case study described by Levasseur, see above, the development of partnerships in Dubinskas' case study organisation is made difficult by the different cultures in the project environments. The main sub-contractor of the engineering project was a Japanese company called Hirata Industrial Machines Co. Ltd. The supplier was given wide scope,

within a broad specification framework, to manage the project to best effect. The project was perceived a success. Firstly, it met its time, cost and specification objectives. Secondly, in the nine-month period after handing over the system software there were no formal engineering change orders and no additions to the contract cost. This was attributed, by Dubinskas, to the joint learning that took place as the relationship between the customer, Apple, and the main sub-contractor, Hirata, developed in the fermentation vat. However, Dubinskas suggests that the model most appropriate to the project during its early stages was not the fermentation vat, but rather the funnel. This was due to a mismatch between the two project environments, with Apple wishing to control the project using formal specifications and a stringent change control mechanism. It took a major threat in terms of meeting the project objectives, in this case the likelihood of time overruns due to the Apple's desire to keep a tight control on the engineering process, to resolve this mismatch and promote an open partnership.

The case studies documented by Levasseur and Dubinskas are useful in highlighting the important feature of partnerships with customers and suppliers in a number of project environments. However, there is a lack of empirical study of the extent to which such partnerships exist, and contribute to the development of other features of a project environment, in types of organisations besides those documented in these, and other, cases. In addition to the feature of partnerships, other features of a project management are highlighted by the case studies, and the other literature referred to earlier in this section. These features include: the sharing of project ideas and information, the holding of project-focused meetings, social gatherings and festivities associated with projects, displays of project information, the bringing together of project teams and the sharing of a common project language. But there is an absence of empirical studies as to whether such features are found in a range of different organisational contexts.

2.2.5 Use of Project Management

The literature highlights a number of consistent factors possibly driving organisations to increase the use of project management principles. These factors include the need to be innovative and creative, the need to renew, the need to learn, and the need to respond to ever increasing competitive environments (Kreiner 1992, Doujer & Haslauer 1991, Roome 1994).

The drivers of innovation and renewal are used to frame a discussion of organisation theory appertaining to project environments (Kreiner 1992). A dichotomy is presented between “the empire of interests” and “the theatre of passions”. Classical organisational theory has individuals governed by economic and material interests. From this viewpoint a project is an “empire of interests”, equating to a small- scale technically rational machine. It is goal-oriented, focused on cost, quality and time objectives, planned and controlled, with predictable project team behaviour based on individuals’ rational interests.

Kreiner sees this formal model as inconsistent with many contemporary project environments, which focus on innovation, renewal and the need for change. Instead Kreiner uses a review of the literature describing project behaviour to suggest the idea of “the theatre of passions”. The actions of project team members, in relation to risk taking, working conditions, reward and performance cannot be justified rationally using individual, narrow economic/material interests. As such, the behaviour of project team members is neither predictable nor controllable.

The need for innovation underpins a model of a project-oriented company developed by Doujak and Haslauer (1991). Their model is characterised by a flat hierarchy and dynamic, often changing, groups of networks. Fundamental to this viewpoint is the concept of iteration. Individual projects are structured as networks; and, at the higher level, each individual network forms a larger network of multiple projects.

The use of project management is linked to the need for learning and creativity (Roome 1994). Organisations become more complex as they develop structures to innovate in ways that ensure social legitimacy in the broader environment. This development leads to the establishment of a project-focused organisation. In the first stage of development, classified by Roome as the “Products Intra-Company”, the focus is on individual products and processes. In the last stage of development, classified as the “Strategic Supra-Company”, the focus is on learning networks and collaborative relationships

The literature reviewed in this section suggests that a change in the nature of the project environment is accompanied by new uses for project management. Whereas project management might be traditionally used to manage such activities as the delivery of time,

cost and quality objectives on individual projects, it is now used in the context of contributing to such activities as the facilitation of innovation and creativity. However, although Kreiner's *theatre of passions* and Doujak and Hauslauer's *model* are developed through comprehensive use of organisational theory, they focus on providing suggestions as to how organisations might be functioning. They do not report the results of any empirical research in respect of testing their theories. Roome uses examples of a number of product and service based companies to suggest how environmental imperatives, business strategies and R&D management may influence the development of project management, but does not draw, or claim, general conclusions based on a representative sample of organisations.

2.2.6 Benefits Anticipated from Using Project Management

The developments in project management discussed in the preceding sections of this chapter produce, according to some literature sources, specific benefits to organisations.

Claimed benefits of adopting project management as a strategic approach to managing change have been identified from an "external" perspective. This perspective focuses on the effect of using project management in terms of the organisation's performance. For example, the widening of the role of project management is seen to lead to projects becoming the basic building blocks in the strategic management of products and services. The use of such building blocks produces products and services that better meet customer requirements, enabling organisations to survive in their business environments (Cleland 1991) and to better respond to increased international competition (Turner 1994). A broadening of the use of project management helps make organisations more adaptable to changing environments. It heightens awareness of internal and external events and pressures, with such awareness leading to the anticipation and implementation of necessary change (Allen 1993).

Benefits are also claimed that have a more "internal" perspective, focusing on the reasons for improved performance. Increasing the use of project management is seen to improve efficiency and increase productivity through better utilisation of limited resources. In addition, objectives and milestones are more consistently achieved through enhanced planning, estimating and cost control (Kerzner 1994). Other claimed benefits of

increasing the use of project management include: freeing up executive time, allowing a big picture overview, allowing better managed change, providing better balanced time, cost and quality objectives, and reducing the barriers to the introduction of change (Dawson 1994).

Benefits from using project management have been claimed in relation to the performance of specific organisations. In the pharmaceutical industry such an approach was claimed to have reduced time to market and hence increased profits and reduced costs (Beattie 1995). In a large complex organisation, the Equal Employment Opportunity Commission in the US, it is stated that the approach led to the successful delivery of the strategic mission (Kemp et al 1993).

The literature reviewed above does not base the claims of benefit as a result of specific research studies. They are either recorded personal reflections in the form of colloquies (Cleland, Kerzner) and editorials (Turner) relating to generic project environments, opinions aimed at practitioners in specific environments, such as IT (Dawson) and Management Accounting (Allen), or statements by project management practitioners working in specific companies (Beattie, Kemp et al). They could all be classed as being project management practitioner or management consultant oriented, in terms of their literature source, rather than research oriented. Given the lack of theoretical frameworks, hypotheses and research designs in this literature it is difficult to gauge the reliability and validity of such claims. Indeed, given the amount of initiatives undertaken in organisations in recent times, any changes in performance could be simultaneously attributable to a number of factors, such as the introduction of TQM, business process re-engineering, as well as to the use of project management.

2.2.7 Obstacles to the Use of Project Management

The literature claiming benefits from increasing the use of project management is placed in the context of future developments. For example, both Cleland (1991) and Turner (1994) place the discussion of past benefits in the context of reflecting upon benefits likely to be realised in the future. There is a general consensus that increasing the use of project management in organisations may often involve major changes in an organisation. The nature of the change is equated to programmes to introduce TQM into organisations

(Stokes 1995) and, as is the case with such TQM-related programmes, are best managed as projects (Firth & Krut 1991).

The structural changes resulting from an increased use of project management need to be accompanied by a programme of communication, education and training. The literature describes a mixture of top-down and bottom-up initiatives. The role of top-down communications is highlighted (Stokes 1995), with the establishment of a management charter, providing a written set of beliefs with the desired cultural values, being a key first step. This step is described elsewhere, with Firth & Krut (1991), for example, emphasising the need for a high-level strategic plan for managing the cultural change associated with the use of project management.

Stokes uses his experience working in a large French organisation to draw some general conclusions about the nature of an initiative to increase the use of project management. Likewise Firth & Krut draw upon their experiences as management consultants working with a number of organisations. The literature does not report the results of research studies showing the validity and reliability of the conclusions in relation to a wider population.

The reported obstacles to the use of project management, detailed in the literature reviewed above, focus on the similarities between project management initiatives and other initiatives, such as TQM and business process re-engineering, that often require major cultural and structural changes. For example, there may be anxiety caused by individual perceptions of the changing value put on behaviours and skills (Firth & Krut 1991). In addition, there may be barriers to change from stakeholders, such as line managers, in relation to new management styles and organisational structures. There may be difficulty in integrating project management into a managerial career path, due to a failure to establish performance management systems linked to project accomplishments (Chaffey 1997).

2.3 Project Structures

2.3.1 Structures for Managing Projects

Traditionally, project management structures have been analysed in the context of managing individual projects. Typically, such structures are distinguished by the relative influence of the project manager and the functional managers involved in the project (Galbraith 1971). At one extreme is the functional structure, where the project is managed by a functional group, and at the other extreme is the dedicated project team structure, where the project manager has formal authority over a selected group of people brought together to work exclusively on the project. In the middle of the spectrum is the matrix structure, where the normal vertical hierarchy is overlaid by some form of lateral authority linked to managing individual projects. Different types of matrix are commonly identified based on the relationship between the project managers and the functional managers. These include functional matrix, balanced matrix and project matrix (Larson & Gobeli 1989).

Case studies of project organisations also report the existence of “hybrid” project management structures. These structures often combine elements of a dedicated project team with features of a matrix (Ford 1993). Such case studies contain descriptions of changes in structure, as project management principles are used more extensively by organisations. The descriptions focus on the way an organisation structures itself to become more project-focused, and, as such, they analyse project management structures in the context of managing a multitude of projects. Hierarchical, vertically oriented and functional-based structures break down into flatter more flexible structures, emphasising vertical and horizontal integration (Thatch & Woodman 1994, Turner 1993b). This change of structure can have dramatic consequences. From the perspective of functional-based, middle managers, it is described as “a world turned upside down” (Firth & Krut 1991), with a resultant loss of power and status for middle managers.

The descriptions above suggest, in structural terms, an inverting of the traditional organisational pyramid. An analogy found in the literature describing the effect of the new focus on project work is of a spider’s web, where managers who once occupied the central, strongest point in the middle of the web, now see themselves occupying weak points on the outside (Ives et al 1993). Elsewhere the spider’s web is equated with the networked

organisation (Firth & Krut 1991). The structure in a networked organisation is flat, flexible, with little hierarchy, utilising temporary task forces or project teams. It is open and permeable and focused on the customer. Crucial to the effective operation of the structure are “strategic brokers”, who from the centre of the web manage ideas and co-ordinate the activities of others (Ives et al 1993). The strength of the structure is its flexibility. The networked organisation consists of a multitude of webs, with activities and connections being made up and broken all the time. Ives et al describe four features of the network organisation:

- Vertical dis-aggregation (where business functions are performed by independent groups within the network)
- Brokers (co-ordinating the activities of the independent groups)
- Market mechanisms (controlling the work between groups)
- Full disclosure information systems (assessing the value of work carried out).

Benefits are claimed of organisations operating a networked structure. Such structures facilitate the effective operation of flexible project teams, speed and flexible delivery of products, lateral communications and a strong customer focus (Firth & Krut 1991). Traditional hierarchical, centralised structures are regarded as being, on occasions, insensitive to local views and traditional decentralised structures as lacking an integrated global view (Ives et al 1993). The networked organisation, which resembles a spider’s web, overcomes both these deficiencies.

The extent to which a networked structure, as opposed to, or incorporating, traditional functional, project team or matrix structures, exists in organisations is not clear. Nor are the benefits claimed of such structures verifiable for a wider population of organisations. Firth & Krut describe such a structure as being appropriate to large organisations, yet give no specific examples of organisations with such structures. Ives et al give an example of a large travel agency in the United States, but do not broaden their investigation beyond this one case study. Whilst Thatch & Woodman frame their discussion in the context of reflecting upon the nature of organisations of the future and, as such, give no examples of organisations currently employing such a structure.

As an organisation structures itself to become more project-focused, and, consequently, manages a number of projects, structures for the strategic co-ordination of multi-projects

and for the centralised support of project management activities are created (Chaffey 1997). The study by Chaffey is useful in that, whilst emphasising the importance of such structures in supporting the management of “portfolios” of projects, it found that less than 60% of organisations surveyed believed they had adequate structures and systems for managing such portfolios.

In addition, the survey found a low density of project management skills in the organisations surveyed, with 60% believing the training provided was inadequate. Over 25% of organisations did not link the appraisal system to project performance and over 60% of organisations believed their software *project management tools needed* improvement. These results provide a useful indication of other problem areas in relation to the operation of project management structures and systems, but, as was stated earlier in this chapter, the validity and reliability of the data cannot be verified.

2.3.2 Structures for Selecting and Developing People to Undertake Project Roles

The project management literature recognises the importance of managing customers and disparate stakeholders interested in a project (BSI 1994, BSI 1995, Morris 1998:3). In addition to stakeholders external to the project organisation there is recognition of the role of stakeholders within the organisation. These stakeholders include not only project managers but also people undertaking other project roles, such as sponsor and project team member (Pinto & Covin 1992, Kirby 1996). Identification of the stakeholders to a project is the first stage in a two stage people-oriented process. The second stage is ensuring the right people are fulfilling the roles identified. In this stage the two key activities are the selection and development, through training and other methods, of the people involved.

The need to focus on people’s interpersonal and general management skills, in addition to technical and project management skills, in the selection and development processes, is a consistent theme in the literature (Barnes & Wearne 1993, Gadenken 1998).

In terms of confirming the relevance of this focus through the findings of specific research, a study by Kezsbom (1992) is pertinent. The study is supported by a clear description of the conceptual framework and the procedures used and the conclusions of the study are consistent with the statistical analysis reported in the results. Kezsbom sampled 285

managers and project team members in a cross-section of high, medium and low technology projects within a sample of Fortune 500 United States corporations. All the projects were self-directed and involved a high degree of horizontal integration between functional areas of the organisation. Her study focused on the management of conflict as a predictor of project success. Using thirteen conflict categories the study concluded that disagreements relating to: lack of, or poorly defined, goals; goals in conflict; interpersonal issues; and poor information flows, were the source of most conflict. Conflict arising from disagreements about lack of cost control authority and the timing, sequencing and duration of activities recorded low scores in terms of causing conflict, a result that contradicted previous studies. As well as drawing conclusions regarding the management of project conflict, Kezsbom makes recommendations consistent with the views of Barnes & Wearne and Gadeken, described above. Selection and training needs to focus on human relation issues and, relating to the specific research question of Kezsbom's study, subsequent team building activities need to be based on reducing the sources of conflict.

There are also case studies that confirm the benefits of selecting and developing people to work on projects based on the need for a broad range of skills and competencies. For example, in reporting on the success of a project introducing a new product within an engineering company, Bergstrom (1994) identifies success in terms of record new product development lead times, reliability targets met and new working processes and procedures established. These successes were, at least in part, attributed to the selection and training of the relevant parties, with a particular focus on developing an understanding and commitment to super-ordinate goals. Training in a number of non-technical areas was regarded as influential in the successful delivery of project objectives in the US Inland Revenue (Kerzner 1989). The training fostered a bottom-up recognition of the importance of project management and, importantly, integrated courses on project management tools and techniques with quality education and behaviour modification training.

There is a suggestion that the development of structures for selecting people to undertake project roles, such as resource pools, supported by skills or competencies databases, benefits organisations (Chaffey 1997). However, as reported in Chaffey's survey of organisations, less than 50% of organisations had such a structure. Although Chaffey's report recognises the difficulty in establishing the processes and behaviours to support such

structures, there is no indication of how the structure operates in the organisations where it is effectively utilised. Nor is there evidence of the type of organisation, if one exists, in which the structure is most likely to be found.

Alongside the consensus of the desirability of selecting and developing through an assessment of non-technical skills and competencies, there is a suggestion that the inherent characteristics of the organisational environment in which people work as a “project team” may influence the specific selection and training activities. In this context models can be applied to a variety of scenarios involving the interaction of people involved in project work. Constantine (1993) developed an “organisation paradigm” model, with four main types. The first type is a “random” organisation, which is characterised by innovation and independence. The second is an “open” organisation, which is characterised by adaptiveness and collaboration. The third is a “synchronous” organisation, which is characterised by harmony and alignment. The fourth is a “closed” organisation, which is characterised by tradition and hierarchy. In addition, he proposes a fifth hybrid paradigm, the “structured open” organisation, specifically for software development projects. The nature of the project work is the key variable, with the applicability of a paradigm varying depending upon the type of project being carried out. Constantine suggests that each paradigm will have different characteristics, such as feedback mechanisms, decision-making modes, and strengths and weaknesses. In addition, selection and training of people involved in projects must take into account the existing organisational paradigm. For example, project managers must be selected to supply skills and knowledge that may be lacking in the paradigm, but they need to interact with other parties in a manner that is familiar and comfortable. Whilst providing a concise theoretical framework for understanding the diverse possibilities in terms of development of teams of people, Constantine does not test his model through empirical study.

The selection and development of people involved in project work, discussed in this section, can be viewed from two perspectives. The first perspective is of the individual project, which has a relatively short-term time scale and relates to developing the skills and competencies necessary to the meeting of the specific project objectives of the current project. The second perspective is less specific to the actual project being undertaken and has a longer time scale. This perspective focuses on the organisation’s capability to

manage both current and future projects. Developing this capability, through the selection of development of people to fulfil both current and future project roles is part of the organisation's culture (Riis & Neergaard 1994). As an organisation learns through its people, the focus is on the people in the organisation. In addition, the people are bound together by the organisation's culture and it is this culture that provides the framework for learning.

2.3.3 Structures for the Evaluation of Performance on Projects

In addition to selecting and developing people to undertake project roles, there is also a need to appraise and reward performance (Stokes 1995, Firth & Krut 1991). Measures and rewards have a strong influence upon actions and behaviour, so a performance management system linked to the management of projects would be expected to be important in organisations carrying out projects (Chaffey 1997). As such, as well as providing people with adequate training in project management and, where appropriate, recognised career paths, an organisation must also structure itself to allow an individual's performance on a project to be linked to appraisal systems.

The literature contains little evidence, in the form of research studies, of the extent to which such structures exist in practice. The work of Firth & Krut is theoretical in nature and does not test the theories through empirical study. The work of Stokes reports how a large French organisation implemented structural revisions in order to align the management of projects to the performance management systems. Yet no conclusions can be drawn from this case study in terms of whether such revisions have taken place, or could take place, in other organisations. As was the case with the discussion of structures for selecting and developing people, there is a reliance on the survey by Chaffey, though the limitations of this survey, noted in previous sections, must be taken into account. In Chaffey's survey over 25% of organisations did not link the appraisal system to project performance. Although Chaffey states that a failure to make such a link means these organisations cannot take advantage of a significant performance improvement opportunity, there is no evidence of why making such a link may be difficult, and what sort of organisations, if any, do take advantage.

2.4 Project Management Systems

2.4.1 Evolution of Project Management Systems

The literature contains a number of case studies detailing how a broadening of the use of project management requires the establishment of a company-wide project management system, with such a system often being accompanied by the development of documented project management processes and procedures. The case studies also provide some indication of the process involved in introducing such a system.

The introduction of a project management system was described in a case study of the Royal Bank of Scotland (Cook 1992). The case analyses the role of the project management system within a strategy adopted by the organisation to counter issues associated with the introduction of paperless offices. The project management system was set up to ensure user acceptance of the new strategy, joint working towards solutions, the setting of realistic expectations and the raising of comfort levels. Methods used to ensure the successful introduction of the system included: newsletters, seminars and training. A variety of benefits were claimed for the new system. It was perceived as ensuring the reduction of time to market for new products and services, the delivery of solutions to problems within budget and the introduction and management of new technologies. Similar methods for introducing a project management system, with similar claimed benefits, were reported in a case study of Unilever International (McDowall 1995) and a case study of a large French pharmaceutical company (Stokes 1995). A case study describing a construction project undertaken by a project organisation on behalf of an owner organisation in another country places the establishment of a project management system in the context of developing project partnerships (Milosevic 1990). The case provides details of how a strategy of owner organisation and project organisation integration was adopted to counter the environmental threats from the different cultures. The author claimed that the project management system facilitated the required integration, ensured involvement of the customer and helped the project organisation demonstrate capability to meet the customer requirements.

These case studies are useful in providing an indication of why, and how, organisations develop a company-wide project management system. They also highlight the importance of ensuring, if necessary, that the established systems facilitate the involvement of

stakeholders both inside and outside of the organisation. A limitation of the studies, though, is the degree to which the conclusions drawn are applicable to a wider base of organisations. The studies also do not provide specific details about the characteristics of the project management systems established: for example, the scope, content and operation of the documented project management processes and procedures. Finally, some of the claims need to be treated with caution. As was the case with studies claiming benefits from using project management, discussed earlier in this chapter, claims relating to the success of a project management system are not easily verifiable and could be simultaneously attributable to a number of factors.

Further literature sources supporting the conclusions drawn from the case studies above are limited. The stages an organisation goes through as systems are developed to support the wider use of project management are described in some detail (Firth & Krut 1991), though such a description is not tested by empirical study. A study of 20 UK defence and engineering construction businesses, incorporating 60 interviews with project managers, directors and senior engineering staff, by Lord (1993) does provide some reliable and valid results in relation to the benefits and process of establishing a project management system. Lord's study reports how the project management system facilitated the delivery of a diverse range of strategic objectives, including the assessment of new ventures, the regulation of internal markets, the management of sub-contractors and the development of stakeholder partnerships. However, as was discussed in relation to the case studies above, there is little detail of how the project management system evolved. Also, given the narrow scope of the study in terms of the types of organisations surveyed, generalising the conclusions to organisations from other business sectors might not necessarily be valid.

The literature reviewed above contains a number of common elements suggesting that the project management systems evolve through a number of key stages. In the first stage, the organisation recognises the need to change and the benefits of a new approach (McDowall 1995). Although senior management drive the recognition of the need to change, the benefits of using project management needs to be accepted by all employees. A culture of empowerment and self-discipline is necessary to successfully introduce project management. In addition, in order to gain long-term benefits from project management, the organisation must be capable of continuous learning and self-improvement (Stokes

1995). The organisation must appraise the current culture (Firth & Krut 1991). This will be done through such activities as attitude surveys and open debates.

In the second stage of the process a centralised project management infrastructure is established. This is dependent upon clear management commitment and board level sign-on at the end of the first stage. As part of increased centralised control a project infrastructure is created at the multi-project work programme level. This infrastructure balances a company-wide prescribed standardised approach to guide the management of all projects and flexible adaptable processes to manage individual projects. The increased centralisation must be sold to the employees of the organisation. Hostility and resistance to change may exist if people do not believe the approach will provide benefits. There needs to be some intellectual justification for adopting a centralised framework based on project working and the avoidance of employee perceptions of a cosmetic, flavour-of-the-month initiative. There are various methods to facilitate the selling of project management. There will be a clearly published methodology, including the role of the project manager in the business context, the principles of project management, the procedures adhered to, and the support mechanisms available (Firth & Krut 1991). Communication of the project management strategy and the commitment of senior management is essential (McDowall 1995). The project management strategy is included, along with the project management methodology, in project management pamphlets or handbooks. Training, in both hard and soft project management skills, starts with selected senior management. It is then cascaded down to all employees. Visible career rewards for project working, with explicit links between project performance and individual employee appraisal are required.

Having established a strong company-wide system of project management, the third stage involves a relaxation of centralised control. The relaxation of controls is made possible by the establishment of a "project management culture, characterised by increased project management competence at both an organisational and individual level" (Firth & Krut 1991). Although key stages in the introduction of a MPM approach are identifiable, there is often iteration and overlap between the stages.

2.4.2 Project Life Cycle Models

A dichotomy is evident in the project management literature in terms of defining the processes associated with managing a project. One viewpoint is linked to the processes associated with the various, ongoing, management activities and the other viewpoint is associated with the activities carried out in the different phases of the project life cycle. Models of project management processes often cover both areas (BSI 1994a: 17). The management processes are presented within the classical management cycle of “plan”, “organise”, “implement” and “control (monitor/re-plan)”. This cycle is used extensively, though it is often amended or added to for specific project environments. For example, Khan & Martin (1989) use a study of a number of systems projects to add “communication” to the list of process categories. The phases of a project’s life are classed as “conception”, “feasibility”, “implementation”, “operation” and “termination”. Conceptually there is a high degree of consistency and agreement in this area, yet in most cases different nomenclature is used. For example, Turner (1993a) identifies “stages” rather than “phases” and reduces the five phases above into a three-phase cycle of “definition”, “execution and control” and “finalization and close-out”.

The discussion of the development of project management earlier in this chapter reviewed literature describing a broadening of the conceptual base of project management. In the context of the project life cycle this broadening suggests an incorporation of pre-initiation and post-delivery stages (Turner 1993a), with an emphasis on “upstream” activities such as attention to a project’s needs and risks (Barnes & Wearne 1993) and “downstream” activities, such as project review. However, as is the case with the literature describing the broadening of project management’s conceptual base, the theory has been not been investigated through empirical study of project management practice.

An analysis of project life cycle models can be seen from a broader perspective than merely defining a potentially key business process. In a project management environment a process model ensures critical success factors are present. In developing a conceptual model for unifying the systems engineering function with project management activities, Boardman (1994) defines a process model as “... a clear, concise and comprehensive description of a process unambiguously shared by all”. At its best, Boardman claims, a process model provides a system of shared values, a baseline of understanding and a

handle on the business culture. Although Boardman explicitly draws upon observations of a particular organisation, GEC Marconi, there is no indication of the extent to which such a model provides the benefits claimed in a wider base of organisations; nor is there an indication of how such a model is successfully developed and introduced.

The work of Boardman suggests there are two issues to consider in relation to modelling the project life cycle. Firstly, the processes for carrying out project work (process execution). Secondly, the processes for ensuring projects are carried out properly (process understanding). A key element in developing project management systems is process understanding; which Boardman states can be achieved through a system of process models to guide and support the management of a project. The pre-eminence given to controlling processes in the project arena leads to the braiding of project management activities into a wider quality management system. Such integration is consistent with the underlying process-oriented philosophy of a quality management system (Froonhof 1995). This integration has led towards internationally accredited standards for linking the project management system and the quality management system (BSI 1995).

There is agreement in some of the literature that models of the project management process are problematic. Fangel (1993) emphasises the open-minded selection of appropriate methodologies based upon the specific requirements of each project. This open-mindedness can be restricted by the adherence to models of standardised project management processes. In this respect Norton (1994) concludes that a project management methodology must not be prescriptive in terms of appropriate project management skills, techniques and processes. Methodologies need to pay heed to such factors as business strategy, management style and existing structures and relationships within the organisation.

In addition to general observations of the kind reported above, criticisms of models are made in terms of the management of specific types of projects. These criticisms are based on general conclusions drawn, mainly, from an analysis of an individual organisation. There is evidence of particular problems in the area of IT projects, where the problems of braiding project management processes with a standardised, sequential model of the systems development cycle are documented. Typical examples are based on an analysis of

the Alliance & Leicester (Abrathat 1994) and of ICI (Murray 1994). Other literature sources provide evidence, mainly in anecdotal form, of the practical failure of theoretical models. For example, Ryan (1990) assesses the desirability of a management control model (“planning”, “executing”, “evaluating” and “revising”) for systems development and, then, outlines reasons why desirable practice is often not achieved during the management of systems projects.

Case studies show the emphasis of many models is on managing the early and latter stages of the project life cycle and ensuring critical success factors are met. Coleman (1994) describes the project management methodology adopted by The Prudential. The model has methods for the pre-implementation appraisal of a project as its key element. Firth (1995) describes a model for the post-implementation assessment of project performance, drawn from a study of the Defence Research Agency, London Underground Limited and a European pharmaceutical company. Konieczny & Petrick (1994) propose a model for the management of international joint venture projects based on a conglomerate of previously developed models. The model provides a stage-sequenced process geared towards meeting multiple stakeholder interests. Kemp et al (1993) detail a model for the management of projects, based on the experiences of the US Equal Employment Opportunity Commission, that links the project management process with the early alignment of projects with organisational strategic goals.

These case studies suggest that a number of conclusions can be drawn. In terms of the character of life cycle models there is an emphasis on “upstream” activities, such as those associated with aligning a project with an organisation’s strategy and managing disparate stakeholder interests. There is also an emphasis on “downstream” activities, such as those associated with reviewing project performance. What is not clear is the extent to which the conclusions apply to the wider population of organisations and not just to the specific organisations included in the case studies.

Further conclusions can be drawn in relation to the sequence in which activities are carried out whilst managing the life cycle of a project. Firth (1995) discusses organisational structures in the context of the design and development of individual projects. He identifies four key elements: operational processes, performance measurement and

information framework, competencies, and organisational structures. Organisational structure provides a framework for leadership and control. Firth makes the point that the design of a project organisation is an iterative process. He also uses the example of the Army as a hierarchically structured project organisation, to demonstrate that the choice of project structure will vary depending upon the organisational context. Firth identifies the importance of sequencing within the design process. Establishing the structure needs to be one of the last activities. Specific jobs need to be defined and roles allocated to people in the latter stages, based on the nature and complexity of the project work and on the perceived level of competencies. The importance of sequencing is echoed elsewhere. Turner, McLaughlin et al (1994), in their keynote speech at the first British Project Management Colloquium, put project management methodologies that have project management processes as a key element into context. They identified three key sequential steps: identification of key success criteria, establishment of critical success factors and identification of appropriate methodologies. This literature provides presents a theoretical framework in which the sequencing of broad activities is a key requirement, but as was the case with the literature on the nature of the activities carried out within the life cycle, the theory is not tested through empirical study.

2.4.3 Project Classification

The literature reviewed in the previous section suggests an understanding of the importance of the management of processes in all stages of the project life cycle is beneficial to organisations. However there are different process models, and different project management procedures, available to guide project work. The adoption of a specific process model may be contingent upon on number of factors, such as the role of the participant, industry practice, the nature of the end-product and the use of terminology (McGettrick 1996).

The need for a contingent approach is confirmed by a study of 150 project managers (Payne & Turner 1999). As a result of their study, Payne & Turner suggest it is better to tailor project management procedures to the size of the project and the type of resource. They concluded that such tailoring of procedures did not reduce the chance of project success, and probably increased it. They also concluded that a common project management approach was appropriate at the “integrative” and “strategic” level, but not

the “tactical” level. As such, at the integrative level a project definition report would be developed for all projects. At the strategic level a milestone plan and responsibility chart would be produced for all projects. However, at the tactical level the planning methods would be selected based on the requirements of the individual project. The study by Payne & Turner is useful in that it considers the experiences of a wide range of organisations. However, the fact that the survey sample is drawn exclusively from project managers who are members of the UK’s Association for Project Management needs noting in relation to the possibility of introducing bias in the survey results.

Parts of the literature argues that the selection of appropriate project management methods and techniques, at the “tactical” level, depends upon the type of project being undertaken (Abrathat 1994), with such factors as objectives, size, complexity, familiarity, urgency and importance being significant selection criteria (Barnes & Wearne 1993). This leads to the suggestion that project classification will facilitate the selection of appropriate methods. In this context Turner & Cochrane (1993) developed a two-by-two matrix that distinguished projects by how well defined are the goals, and how well defined are the methods of achieving them. Type 1 projects have goals and methods well defined. Type 2 projects have goals well defined and methods not well defined. Type 3 projects have goals not well defined but methods well defined. Finally, Type 4 projects have neither goals nor methods well defined.

Turner & Cochrane propose that the place of a project in the matrix can be used to select the planning methods used in the start-up and implementation processes in the first stage of the project life cycle. For example, Type 1 projects, such as engineering projects, would use activity planning. Type 4 projects, such as research projects, would use milestone planning through life cycle stages. There are a number of potential problems with this proposal. Firstly, the validity of classifying projects exclusively in terms of goals and methods. As stated above, there may be other important characteristics of a project to consider, such as the degree of risk in carrying out the work, the type of business benefit being delivered and the position of a project in a multi-project work programme. The validity of some of the classification examples given is also questionable. For example, Turner & Cochrane classify applications software development projects as Type 3, meaning they have well defined methods, but goals not well defined. This generalisation

about the characteristics of such projects is debatable. It could be argued that on many applications software development projects the goal is often clear, but what is intangible, and hence more difficult to define, is the business benefit that will be realised from achieving the goal. The final issue is the need to recognise the changing nature of projects over time. For example, methods may become more easily to define as a project progresses through its life cycle.

Despite its limitations the work of Turner & Cochrane is useful in introducing the issue of project classification in the context of operating a project management system. Rather than being merely a means of labelling different categories of work, project classification has a key role in deciding the project management methods employed. However, there is no indication in Turner & Cochrane's work, or any other of the literature reviewed in this section, of the extent to which project classification processes to select appropriate project management methods exist in practice, or, if such processes do indeed exist, what classification criteria are used.

2.4.4 Project Success and Failure

2.4.4.1 Customers and other Stakeholders

Consideration of the use of project management in organisations needs to be carried out in the context of the overall objective, which is to deliver a "successful" project. Ultimately, in the long-term, a successful project is one that provides benefit to the sponsoring or customer organisation. However, within this context, a project is perceived as successful if the customer of the project, and others, are satisfied. This introduces the notion of satisfying the key parties to a project, which was introduced earlier in this chapter in the discussion of structures for selecting and developing people to undertake project roles.

The eminence given to satisfying the requirements of customers, and evaluating project success through the customer's perception of the project, suggests a link between the disciplines of project management and quality management. Projects are carried out on behalf of a project organisation's customers, whether the customers are internal or external to the company. As meeting customer requirements is a definition of "quality" (Oakland 1993: 3-5), a "quality", and hence successful, project is one in which the end product meets the customer requirements. In addition to delivering the end product, the customer often

requires the project to be managed in a certain way, with overall success depending upon both the quality of the product and the quality of the process. This suggests that for organisations setting up a project management system, the delivery process may be as important as the end product being provided. In this context, drawing further from the discipline of quality management may be useful. A key concept of quality management is the idea of continuous improvement (Oakland 2000, Dale 1994). Applying the principle of continuous improvement to a project environment, one might expect any benchmarking activities aimed at continuously improving an organisation's performance to consider not only the project outcome, in terms of meeting a specification within time and cost constraints, but also the project management performance. As such, benchmarking project management performance could include a comparison with other organisations of an organisation's processes for managing the requirements of customers.

In addition to satisfying the requirements of the customer, some of the project management literature highlights the importance of other stakeholders to a project. In this respect, activities associated with identifying, analysing and managing the requirements of customers and other stakeholders are central to the operation of a project management system. For example, BSI (1995) state five fundamental quality principles to achieve good project management. The first principle highlights the importance of customers and stakeholders. Specifically it says:

“Principle 1: Maximizing the satisfaction of customer and other stakeholder needs is paramount.”

(BSI 1995: 7)

This emphasis on stakeholders is found elsewhere in the literature. For example, Morris (1998:3) states: “Successful project management is about delivering a project outcome that meets or exceeds the project stakeholders' requirements.” Gareis (1990) describes how the setting up of a project management system is linked to a strategy of increased quality of service, through managing the expectations of external stakeholders, project owner, project manager, project team members and members of the owner organisation. The setting up of such a system is characteristic of project environments where the focus of work is on managing increasingly vocal, demanding and diverse stakeholder constituents (Cleland 1994).

The literature provides definitions of the different stakeholders. A classification is provided by Turner (1993a). The main parties are identified as “owner” and “contractor”, also referred to elsewhere as “clients” and “sub-contractors” (BSI 1994). Other key parties are the “sponsor”, “champion”, “manager” and “integrators”. Interested parties include “users”, “supporters” and “external stakeholders”, such as environmental groups, the competition and the wider community. The concept of external stakeholders reflects a move towards vertical integration of customers and other stakeholders upstream and downstream of a project teams’ supply chain.

A number of theoretical reviews of the subject and case studies of project environments have considered the influence of different stakeholder groups on project success and, in some cases, detail methods to positively influence such groups. The potential negative influence on project success of external stakeholders, such as environmental groups and competition is recognised (BSI 1994) and analysed in a number of cases.

The negative perception of customers of an organisation developing computer software for human resources management was identified as the key measure of project success (Laird 1992). In response to these negative perceptions, a pro-active communications strategy was built into the project management system to ensure quality of the project management service. This strategy led to the setting up of communication milestones, which guaranteed the reporting of meaningful progress to the client. Formal communication channels, including a regular newsletter, were also established between the project organisation and customer organisation to ensure “quality of process”.

Another case study analysed how ICI established a project organisation and a project management process for the management of telecommunication projects that ensured customer involvement at critical points in the project life cycle (Bryde 1995). The case also considered how the introduction of an organisation-wide project management process led to a greater standardisation of performance in terms of service delivery. This standardisation was believed to have contributed to the improving of customer perceptions, which in turn led to the project organisation achieving its business objectives. A case study of an initiative to introduce project management more widely into Fisons considered the influence of another stakeholder group. The implementation of the

initiative was hindered by hostility from employees (Beattie 1995). To overcome this hostility, and produce positive perceptions of the initiative, the approach adopted by Fisons linked the implementation of the project management system with the management of the people in the organisation. In particular, they established clearly defined roles and responsibilities at the programme and project levels. They identified the following key roles: Programme Director, Project Leader, Project Manager and Core Project Team Members. The people carrying out these roles need to ensure there was top down and bottom up commitment to the project management concept. Consistent principles and attitudes were established and permeated to all staff in the organisation through education and training activities.

An analysis of the failure of a project to introduce an integrated requisitioning system into a large international food producer considered the influence of key stakeholders within the organisation (Kirby 1996). The study of the case led to the conclusion that the lack of success of the project was caused by a failure on the part of the organisation to recognise the different perspectives of the various stakeholders. For example, staff working in the regional manufacturing plants perceived the project as leading to increased regulation and oversight from Headquarters. Sales staff and payroll clerks perceived the project as a threat to their jobs. These, and other, key stakeholders saw themselves as “victims” rather than “beneficiaries” of the project and erected barriers to its completion. By way of contrast, the organisation perceived the project purely in terms of cost reduction and process efficiency and failed to recognise, and manage, the stakeholders who did not share the organisation’s alternative perspective.

A common theme in the literature, in terms of influencing perceptions, is the involvement of stakeholders in the project management system. This involvement incorporates both stakeholders who are internal to the organisation, such as employees, and stakeholders who are external to the organisation, such as customers and suppliers. In the latter case, the stakeholders are managed through partnerships. In reporting on practical experience of ten project initiations, Van den Honert (1991) identified early partnerships between contractor and supplier organisations as a critical project success factor, though there is no indication in the report of the characteristics of the organisations reviewed. The role of partnering, or “win-win” project management, is highlighted in relation to the successful management of

large-scale construction projects (Milosevic 1990, Moore et al 1992), though, as with the work of Van den Honert, the validity of the findings to other types of project environments is not considered.

In addition to developing systems enabling key stakeholders to be involved in projects it might also be necessary to ensure that some stakeholders undertake certain roles. Pinto & Covin (1992) described a detailed systematic process for assessing and managing the needs of stakeholders in the owner organisation in which the project manager fulfils the role of project marketer. They draw from marketing theory to suggest that the establishment of a project marketing plan involving client analysis, marketing strategy and evaluation and control are important activities for the project manager. However, they do not test the validity of their theory through empirical study.

Previous empirical research and anecdotal evidence formed the basis of a description of the characteristics of a project champion (Pinto & Slevin 1989a). A project champion is defined as an individual who “identifies with a new development (whether or not he made it), using all the weapons at his command, against the funded resistance of the organisation.” The champion has a key role in influencing perceptions of a project. Specifically focusing on the implementation stage of a project’s life, Pinto & Slevin concluded that project champions were significant in ensuring project success, although, again, this conclusion is not based on any specific research.

In terms of studies relating to the importance, and methods, of stakeholder involvement of groups internal to the organisation, such as project team members, the work of Pinto & Pinto (1991) is useful. Pinto & Pinto carried out a research study to determine the importance of, and the factors leading to, the successful interaction of various functional groups involved in a project. The study consisted of a mail survey of 299 project team members involved in a project to either introduce a new programme or service in one of 73 hospitals in the US states of Pennsylvania, Ohio and New York. Based on their results, Pinto & Pinto suggest some pragmatic implications for how project managers can effectively involve project team members, though these suggestions have to be considered in the context of the single type of organisation surveyed.

Pinto & Pinto concluded that co-operation between different organisational functions is essential to project success. All party involvement, which in this case is between the different functions, leads to success in the context of both short-term project specific criteria and long-term non-project specific criteria. In particular, co-operation resulted in better capability for employees to contribute to the success of future projects.

In relation to the factors leading to effective horizontal integration of the different stakeholders Pinto & Pinto report findings in two areas. Firstly, factors that are sole predictors of project success. Secondly, factors that when taken into consideration in conjunction with other factors are predictors of project success. Their study identified five main factors: higher-level “super-ordinate” goals, physical proximity of the parties involved, accessibility of the people, project team rules and procedures, and organisational rules and responsibilities. In terms of sole predictors of project success, super-ordinate goals, accessibility, project team rules and procedures were significantly related to cross-functional co-operation, whilst the other factors were not. However, when considered together, the significant factors were super-ordinate goals, project team rules and responsibilities, and physical proximity.

The literature on the subject of project stakeholders is useful in highlighting a consensus of opinion that the perceptions of stakeholders both external and internal to the organisation are not only important measures of project success but also may have an influence on a project’s ability to deliver its objectives. The case studies and empirical research reviewed above provide examples of this influence and, in some cases, suggest strategies and tactics to influence perceptions in a positive fashion. What is not clear, though, is the extent to which the conclusions and recommendations made from studies of individual projects, individual organisations, or specific business environments can be applied to a wider range of organisations.

2.4.4.2 Project Success Criteria

There are two broad issues associated with project success and project failure: the criteria used to define and measure success and failure, and the factors leading to success and failure. Turner (1994) observes that little has been written about success measures and success criteria, whilst much has been written about success factors.

In terms of the literature on the subject, it has been noted that, whilst much has been written about the factors leading to success and failure, little has been written about project success criteria (Turner 1994).

In carrying out a review of the previous literature on project success criteria, Freeman and Beale (1992) provide an indication of the multi-attribute nature of measuring project success. Freeman & Beale identified seven main project success criteria. In order of frequency of mention in the literature reviewed, the criteria are:

- Technical performance (which incorporates scope and quality),
- Efficiency of project execution (which incorporates time and cost),
- Managerial and organisational implications (which includes the satisfaction of the parties involved and the degree to which the project was carried out without disrupting the organisation),
- Personal growth (of the project team)
- Project termination (in terms of handover to operations)
- Technical innovativeness (in relation to the implementation of the solution).
- Manufacturability and business performance (which focuses on commercial performance).

Similar success criteria are stated elsewhere in the literature (Turner 1993a, Morris and Hough 1987: 193). In addition to stating success criteria consistent with Freeman & Beale's classifications, Morris and Hough (1987) broaden the success criteria of "project termination" to include effective and reasonable cancellation of projects, at any stage of the project life cycle.

From their review of the literature, Freeman and Beale identify technical performance, cost and duration as the main criteria used by one particular stakeholder group, project sponsors, in measuring success. This view is not based on empirical studies, rather on the frequency of mention of the various criteria in their review of the literature. This has a very narrow perspective in terms of measures of project success, reinforcing the traditional view of a successful project as one meeting internally focused objectives of quality, cost and time. Also, there is no indication in their review of the literature of the extent to which frequency of mention of criteria relates, if at all, to importance of different measures. Nor is there an indication of the project environments considered in the previous literature or the research methods used in identifying relevant project success criteria.

Nicholas (1989) also carried out a review of academic studies and anecdotal reports on project success criteria, published over the preceding twenty years. From this review,

Nicholas concluded that the satisfaction of the key project participants was the over-riding criterion when measuring project success, though, as with the study of Freeman & Beale, there is no indication of the influence of environmental factors on the relative importance of the different success criteria. There is also no indication of the extent to which project management practice in organisations uses methods to ensure project participant's success criteria are identified and managed.

Deutsch (1991) confirms the importance of key stakeholder's perceptions of project success in an exploratory analysis relating the software project management process to project success. Deutsch carried out a survey of 24 completed software engineering projects. Whilst recognising the exploratory nature of the research, Deutsch concluded that the perceptions of the ultimate users of the new systems, in relation to how the project was managed, was a key measure of project success. A study of the significance of project structure on the success of 546 development projects, by Larson & Gobeli (1989), came to similar conclusions. Larson & Gobeli used the criteria of "cost", "schedule", "technical performance" and "overall" to measure project success, with the "overall" criterion incorporating measures of business benefit, such as market share and technological breakthrough. Larson & Gobeli concluded that the "overall" measure of success often overrides the other criteria.

The importance attached to measures linked to the project management process is found elsewhere in the literature. Kerzner (1989) analysed projects undertaken by the United States Internal Revenue Service in the preceding twenty years, with a view to identifying how project management had changed in the organisation over that period. Kerzner concluded that, whilst in the past, success criteria associated with the quality of the product, such as technical performance, cost and duration, were the important measures, the quality of the project management process, as perceived by the parties involved in the project, were now equally as important. Detailing their experiences of projects at Shell, Neumann et al (1993) identified how an effective project management process, which facilitated employee involvement in projects, generated a "golden glow" for the project team. Neumann et al believed that this golden glow resulted in the project team perceiving the project as a success, even in situations where the product quality was perceived as low.

In considering a large-scale construction project, Milosevic (1990) takes the concept further, establishing owner satisfaction with the project management process as a key success criterion.

The studies by Deutsch and Larson & Gobeli, and the case studies reviewed in the previous paragraph, indicate a common view that perceptions of the quality of the project management process are as important as perceptions of the quality of the delivered end product. However, the studies by Deutsch and by Larson & Gobeli are limited to one type of project environment, and the case studies do not test their conclusions, through empirical study, across a wider range of organisations and project environments. Nor do they indicate the extent to which project methods are used to ensure that success criteria associated with the quality of the project management process are identified and, subsequently, managed.

The literature reveals attempts to classify project success criteria. One variable used in the classification process is the time scale perceptive used when considering project success. In their study of the importance of, and the factors leading to, the successful interaction of various functional groups involved in a project, Pinto and Pinto (1991) distinguish between short-term and long-term success criteria. Short-term criteria, such as meeting performance, cost and schedule objectives are project specific and are measured prior to project closure. Long-term success criteria, such as delivering business benefit, are not necessarily project-specific and are measured after project closure.

The importance attached to business benefit is found elsewhere in the literature. In a case study of the TSB Lane (1993) explicitly links project success with the delivery of benefit. In describing the approach to project management adopted within by the organisation, Lane defines a “successful project” as “... one that delivers the planned benefits to the business and meets all agreed product, cost and schedule targets.”

There are indications that the focus on using business benefit as a key measure of project success is reflected in methods for managing the project life cycle. For example, Rauf (1999) discusses the case of a successful outcome to a £250 million project for a new facility to manufacture electronic components.

The project was completed in 13 months compared to the industry norm of 28-36 months and the time between the physical facilities being completed and the facilities being fully operational (time-to-ramp production) was 21 days compared to the usual 18 months. Rauf believed that the hiring and training of production staff prior to completion of the facility achieved the faster time-to-ramp production, with the extra cost of having the staff overheads earlier being offset by the earlier realisation of benefit. The opportunity to increase the level of benefit whilst in the position of market leader, through earlier revenue generation and premium profits, also led to an agreed over-spend of 4%. What is not clear, though, is the extent to which a focus on facilitating the early realisation of benefit exists in other organisations.

Pinto & Pinto (1991) identify another potential classification for project success criteria. They describe traditional criteria associated with measuring performance against the cost, time and performance objectives as “task outcomes”. In addition, they include a criterion associated with the likelihood of usage of the project solution under this classification. They class another group of criteria as “psychosocial outcomes”. This includes the satisfaction of inter-personal relationships of parties to the project and the perceived importance of the project. In their study they establish the need of meeting both task and psychosocial outcomes. In some of the literature reviewed previously, the meeting of psychosocial outcomes relates to measures of satisfaction of client/sponsor, users, project manager, senior management and project team members.

A further success criterion with a longer time perspective is “underlying capability” (Firth 1995), where underlying capability is an amalgamation of many of the criteria identified earlier and is a measurement of the capability of learning. In reviewing the project management experiences of three organisations, Firth makes the link between long-term business goals and project success, and suggests that performance measures be related to the fulfilment of business targets and the commercial progress of the company. Firth provides no evidence, in the form of empirical study, of the extent to which such measures exist in practice, though there are indications that they may often be absent. For example, Taylor & Graham (1992), in analysing two organisations from the construction and retail sectors, confirmed the need for a shift towards measurement and reporting of performance in terms of non-financial criteria. Taylor & Graham conclude that there is a need for a

focus a longer time scale perspective when measuring the success of projects and that techniques need devising to measure the development and capability of the people in the organisation in relation to project management.

Considering the longer time scale suggests that projects need to be seen not just as a means to an end and that organisations need to develop, and sustain, a broader perspective where projects are seen to provide longer-term benefits. However, such a perspective may be more easily developed and sustained in certain organisation contexts. For example, Abrathat (1994) discusses measures of success and failure for “research” and “Information Technology infrastructure” projects in the Alliance & Leicester. Abrathat describes how projects are evaluated from the multi-project or “work programme” viewpoint. The ultimate success of an individual project may only be measured by considering long-term business objectives. Such a perspective is, perhaps, easier to develop and sustain in an organisation where there is a strong focus on project work and a large number of projects are undertaken by the organisation on a regular basis. It is also, perhaps, easier to develop in relation to measuring the success of information technology infrastructure projects, as they can be viewed as “enabling” and not as an end in themselves.

The classifications of success criteria above are useful in assisting the identification of possible success criteria and providing a focus for the measurement of project success, though studies to date do not consider the relative importance of different classes across a range of diverse project environments.

Wateridge (1995) carried out a study of the relative importance of project success criteria, which is important in that the results indicate that the relative importance of success criteria may vary between stakeholder groups. Wateridge assessed the impact of success criteria and critical success factors in over 100 information technology (IT) projects. Project managers and users were asked their views on project success, success criteria and the factors leading to success or failure. The study found that, in terms of frequency of mention of the major success criteria, there were differences between the two parties. The most important success criteria of project managers, in order of importance, were “meeting user requirements”, “meeting budgets” and “meeting timescales”. Whilst for users of the delivered product, the important criteria were “meeting user requirements”, “happy users”

and “meeting budget”. It is significant that “happy users”, which included the process of delivering the product, is identified by users, but not by project managers, as important.

Wateridge also found the relative importance of success criteria changed depending upon whether the project was classified as a success or a failure. For projects perceived as “failures” project managers ranked, in descending order, “meeting budget”, “meeting timescales” and “meeting user requirements” the most important criteria. The top ranking success criteria for users were: “meeting user requirements”, “achieving the purpose” and “happy users”. Wateridge identifies the emphasis placed on satisfying time and budget constraints, on the part of project managers, as a significant factor in project failure.

Based on the survey results, Wateridge suggests the need for a process to both identify and deal with the different success criteria stated as important by the various stakeholders. As part of this process, the number of different project success criteria are increased to include “meeting quality constraints”, with the definition of “quality” varying between stakeholders. The quality criterion needs to be understood at the start of the projects, with all stakeholders agreeing on their different views of the definition of quality. These definitions can then help guide the selection of appropriate methods for managing the project life cycle.

The study by Wateridge is useful in providing evidence of the differing levels of importance attached to project success criteria by different stakeholder groups. However, Wateridge’s research focuses on one type of project environment, information technology, and on only two stakeholder groups, project managers and users. It is not clear to what extent the findings of the study apply to other project environments and to other types of stakeholders.

2.4.4.3 Project Critical Success Factors

As part of his review of academic studies and anecdotal reports on project success criteria, discussed in the previous section, Nicholas (1989) carried out a force-field analysis to investigate the nature of different factors that influence whether a project is successful or not. Nicholas identified two broad groups of critical success factors: those associated with the stakeholders of top management, project manager, project team and user, and those

associated with the use of project management techniques. Nicholas suggests that critical success factors are facilitating or restraining. For example, the commitment, involvement, skills and authority of the project manager facilitate success, whilst a lack of those same factors inhibits success. Nicholas also concluded that the influence of a success factor, and its corresponding failure factor, could not be measured in terms of the absence or presence of a factor, rather its influence varies depending upon its “strength”. In addition, he suggested that the different forces are not equal in strength and are not independent. For example, having top management support, or the right project manager, impacts on other forces through “a ripple effect”.

The dichotomy of facilitating and restraining factors is evident in other literature on the subject of critical success factors. Barnes and Wearne (1993) provide a list of factors leading to project success and project failure. The parties involved in the project need to consider the factors leading to project failure, such as poor communication, although such consideration does not guarantee success. The failure factors are restraints on project performance, but the success factors, such as a clear definition of project objectives, are needed to facilitate good performance.

The literature on critical success factors shows a degree of commonality in terms of the factors regarded as the most important influences. This is demonstrated in the work of Barnes & Wearne (1993), Cash & Fox (1992) and Neumann et al (1993), which are representative of the current literature.

All three sources identify a critical link between success factors and the wider business perspective. Barnes & Wearne articulate this in terms of well-defined project objectives that relate to the business purpose, Neumann et al identify the need for clear and credible business-related goals and Cash & Fox discuss the wider business perspective in terms of ensuring senior management involvement in the project. This wider perspective is important in the context of long-term measures of project success. The focus of some project critical success factors is on ensuring the project management system delivers the agreed project objectives. These objectives usually concentrate on cost, quality and time, with the assumption being that the overall business benefits of undertaking a project have been properly identified (and that these benefits have been successfully translated into

project objectives). However, as was highlighted in the previous section, a criterion of success is meeting the expectations of stakeholders groups, including, in some cases, the sponsoring organisation. All the facilitating forces may be present (and the restraining forces absent) and a project may meet its objectives; but if a project does not deliver any benefit to the organisation it will, ultimately, be perceived as a failure. A case in point is a project to implement a new business strategy into an organisation. The system used to manage the implementation of the strategy may be valid and correct, yet the chosen strategy may be wrong. As such, the project may not deliver its business objectives, leading key stakeholders, such as senior management and shareholders, to view the project as a failure.

Effective leadership is a common factor identified by Barnes & Wearne and by Cash & Fox, and is emphasised elsewhere in the literature. For example, in analysing developments in the project management “bodies of knowledge”, Curling (1995) criticises the lack of information about the “art” of project management and states that at the centre of the “art” of project management is leadership. This is echoed by Cleland (1995), who states the case for the inclusion of leadership in project management bodies of knowledge.

The studies by Barnes & Wearne, Cash & Fox and Neumann et al identify good communications as a critical success factor. Barnes & Wearne highlight the need for good communications in the decision making process and between the parties involved in the project. They state that communications are facilitated by the geographical location of the various parties. Cash & Fox identify communications between people at different levels in the organisation as critical. Neumann et al give details of the importance of communications with the customer, with good communications being facilitated by the formal involvement of the customer on the project team.

In addition to the common success factors, the authors list other critical influences on project success. Barnes & Wearne highlight the importance of a risk policy, anticipation of problems, early decisions and a committed project team. Cash & Fox identify control and reporting, and staffing as important influences on success. Neumann et al highlight the influence of proper rewards, in terms of team empowerment, on project success.

The review of the literature indicates a high proportion of work based on practical experience. Cash & Fox drew upon their experiences in the implementation of computer systems. Neumann et al based their conclusions upon their experiences working on research & development projects in Shell. A further limitation of previous studies was highlighted by Wateridge (1995), who found that previous research mainly examined the views of project managers in relation to the relative importance of different success factors. Wateridge widened the scope of research to consider, in addition to the views of project managers, perceptions of users of the importance of critical success factors. His research found that the different stakeholder groups attached different levels of importance to success factors. Users identified the lack of user involvement, good communication, well-defined objectives and proper planning as factors leading to project failure, whilst project managers identified the lack of leadership, well-defined objectives and proper planning. A significant variation was also identified in relation to monitoring of the project. Users perceived this factor to be absent in many failing projects, whilst project managers did not perceive an absence of monitoring as a contributory factor to failure.

As was the case with Wateridge's study in the context of project success criteria, the results are useful in providing evidence of the differing levels of importance attached to project critical success factors by different stakeholder groups. However, as stated in the previous section, Wateridge's research focuses on one type of project environment, information technology, and on only two stakeholder groups, project managers and users. It is not clear to what extent the findings of the study apply to other project environments and to other types of stakeholders.

A number of authors have classified project critical success factors. Nicholas (1989) devised a three-point classification model in order to carry out his force-field analysis. Hubbard (1990), in a study of projects in the utility and energy industries, developed an eight-point classification model. Pinto & Slevin (1989) devised a Project Implementation Profile to model success factors. In their study a classification process facilitated investigation of variations in the relative importance of critical success factors.

A research study by Belassi & Tukel (1996) is useful in highlighting the possible influence of the environment in which a project is undertaken on the relative importance attached to

critical success factors. Rather than tabulating lists of individual factors, they identify groups to which critical success factors belong. A distinction is made between “factors” and “system responses”. Factors relate to the underlying causes of success and failure and system responses are their effects. Belassi & Tukel grouped factors into four areas:

- Factors relating to the project, such as uniqueness and urgency
- Factors relating to the project manager/project team, such as competence and commitment
- Factors relating to the organisation, such as top management support
- Factors, such as client and competition, relating to the external environment.

In terms of the independence of these factors, Belassi & Tukel came to conclusions consistent with those of Nicholas, discussed earlier. The four factor groups are interrelated, one factor might influence another factor in a different group and success is influenced by a combination of factors. Belassi & Tukel concluded that, in general, the factors of top management support and project manager’s competence and ability to co-ordinate were strong influences on success.

They also examined changes in the ranking of factors based on the variables of industry type, importance of success criteria, organisational structure and size of project (represented by the number of activities). Analysing success factors using these variables highlighted the influence of industry type. Factors relating to project team members, such as technical background and commitment, were the most critical for construction and information systems industry sectors, whilst environmental factors were regarded as especially critical for the construction industry.

In terms of the implications for the selection of project management methods, there is an implicit assumption in the literature that the initial identification of project critical success factors is the key step in the process. To facilitate this process Nicholas (1989) describes a suite of activities involving surveys, workshops and action plans. In terms of the subsequent methods employed during the project life cycle, there is a focus in the literature on dealing with people issues.

Pinto & Covin (1992) focus on the success factors of client consultation and client acceptance, which they identify as especially critical for research and development and new product development projects. They use these factors as the rationale for developing a “project marketing” framework. This framework provides a systematic process for

convincing the clients of the benefits and usefulness of the finished product. This process is built into the methodology for managing the project life cycle. Levasseur (1993) proposes methods linked to understanding the organisational “culture” in which the project is being carried out, based, primarily, on his experiences working for a major computer manufacturer. In a similar fashion to Pinto & Covin, Levasseur focuses on methods for analysing the client’s needs, using the initial diagnosis of the “problem”, as carried out by the client, as a tentative hypothesis for further investigation. Martinez (1994), in analysing large-scale information systems project failure in five different organisations, also focuses on the parties involved and the culture of the organisation in which the project is being carried out. Project management methods are prescribed based on the critical success factors of clearly scoped projects and a well understood organisational culture. These factors are considered from the perspective of the different parties involved in the project, both internal and external to the project team.

The theoretical-based work of Pinto & Covin and the analysis of case studies by Levasseur and Martinez show that some methods for managing project critical success factors focus on people issues. They also suggest that dealing with the people involved in a project is a key activity during a project’s life. However, these studies have their limitations. Pinto & Covin do not test their theory through empirical study, and the validity of the conclusions drawn from the cases to a wider range of organisation settings is not tested.

2.5 Statement of the Problem

2.5.1 Introduction

From the review of the literature a number of broad conclusions can be drawn. These conclusions give a suitable context to the research questions and the research hypotheses contained in the remainder of this chapter.

The literature review highlights claims in the literature regarding an increase in the use of project management. There are also suggestions that, accompanying this increase in project management usage, organisations develop project management-related structures and systems. Generally, the theorising that leads to these claims is based on personal experience and individual reflections. There is also the question of the sources of the information. Many are written by project management consultants who, whilst being able

to draw upon relevant personal experiences, could be argued as having a vested interest in promoting a wider use of project management as being of potential benefit to organisations. Similarly, much of the literature suggesting such developments are in practitioner-oriented project management journals, linked to project management professional bodies, where a stated aim of such bodies is to encourage the use of project management. Therefore, it could be argued that, in a similar fashion to project management consultants, claims in such journals have to be considered in the context of the vested interests of the bodies linked to the journals in which the claims are made. However, regardless of the question of the quality of the literature sources, in order to test the validity of the developments described, there is clearly a need for research, in the form of empirical study of project management practice, in the broad areas of project management uses, structures and systems.

In some of the project management areas reviewed in the literature there are pertinent research studies. However, in most cases, there are limitations to the studies that suggest the necessity of further research. For example, case studies and empirical studies relating to project success criteria highlight the importance of stakeholder perspectives in measuring project success, yet it is not clear to what extent such conclusions are valid beyond the narrow area of investigation of the studies reviewed. Clearly, in this area of project management, and others included in the review, there is need for research that involves study of a diverse range of organisation and project environments.

Theories reviewed in the literature suggesting that there have been developments in the field of project management, for example a broadening of its conceptual base to emphasise stakeholder management, introduce the issue of project management maturity. There is an implicit assumption that differences in the utilisation of project management principles, perhaps in terms of the specific uses of project management or the existence of structures and systems to support the management of projects, will be evident across organisations. This suggests that the mature utilisation of project management, not just in terms of the percentage of work classed as project work, might be found in organisations with a traditional focus on managing projects. Therefore, in terms of the requirements for diversity of organisations studied in any research, there is a need to include, for purposes of comparison, both organisations with a traditional project focus and those without.

The review of the literature is grouped into the three areas of project management uses, project structures and project management systems, yet, within these broad areas, the review indicates that there are a great many issues to be considered. For example, in terms of project management structures, potential areas for further investigation relate to the existence and characteristics of the following structures:

- to manage individual projects,
- for the strategic co-ordination of multi-projects
- for the centralised support of project management
- for selecting and developing people to undertake project roles
- for the evaluation of performance on projects.

The large number of issues included under each of the three headings highlights the broad nature of the required research. To address this requirement a number of research questions with, in some cases, accompanying research hypotheses, have been developed in each of the three areas. These questions and hypotheses are detailed in the following sections. In support of the research questions and hypotheses, brief reference is also made to specific findings from the review of the literature.

2.5.2 Use of Project Management

2.5.2.1 Development of Project Management

A number of developments are described in the literature in relation to a possible increase in the use of project management. These developments include an increase in the use of project team structures, an increase in the use of project management methods and an increased role for projects as a strategic tool. The following research question focuses on investigating the extent to which such developments have taken place in practice.

Research question: *How does project management develop in organisations?*

In terms of the factors influencing changes in the use of project management, in whatever form those changes may take place, external factors, such as pressures from customers and from the competition, were highlighted. The ability to use theories and concepts from the disciplines of quality management in the context of project management suggests there may be other factors, such as the role of management and technology, influencing such changes. Consideration of the relative importance of external and internal factors provides the rationale for the next research question.

Research question: *To what extent do factors linked to the external environment influence the development of project management in organisations?*

2.5.2.2 Importance of Project Management

The literature contains claims of a general increase in the importance of project management in all types of organisation. The claims also suggest an upward trend in terms of changing importance and, to some extent, a degree of homogeneity across an organisation in terms of the level of importance of project management. The next research question aims to investigate these issues.

Research question: *To what extent do subjects perceive project management as being important to their organisation?*

2.5.2.3 Scope of Project Management

Accompanying the descriptions of an increase in the use of project management are suggestions of a broadening of its scope of work to include the management of activities not traditionally associated with project work. This leads to a potential dichotomy in terms of definitions of a project. On one hand, projects are viewed as being appropriate vehicles only for the management of major, one-off, capital-intensive activities, whilst on the other hand, they are viewed as being appropriate for managing all business-led change.

A further useful dichotomy highlighted is between hard and soft projects. Traditional project areas, such as construction and engineering, have a large proportion of hard elements, such as tangible benefits and easily quantifiable objectives, whilst newer project areas, such as re-structuring and managing cultural change, have a large proportion of soft elements, such as intangible benefits and less easily quantifiable objectives. Consideration of the extent to which the different definitions of a project exist amongst practitioners, and the importance of such an existence in terms of increasing the use of project management, leads to the following research question.

Research question: *To what extent do subjects perceive project management as being applicable for managing all business-led change?*

Related to this research question are a number of hypotheses. These aim to test the extent to which the characteristics of an organisation and a subject's involvement in projects are linked to definitions of a project. In terms of the testing of specific relationships, the aim is to consider the extent to which a possible involvement in new project areas is associated with perceptions of the appropriate scope of a project. Therefore, it is hypothesised that the organisation types listed may have a larger proportion of subjects believing projects are a vehicle for managing all business-led change. It is also hypothesised that an involvement in new project work areas, such as those classed as soft projects, may be linked to a subject's perception of the appropriateness of a project for the management of all business-led change.

Hypotheses testing the relationship between perceived applicability of project management and the characteristics of an organisation:

Organisations with a strong project-focus have a larger proportion of subjects believing projects are an applicable vehicle for managing all business-led change than do organisations with no strong project-focus.

Manufacturing organisations have a larger proportion of subjects believing projects are an applicable vehicle for managing all business-led change than do service organisations.

Private-sector organisations have a larger proportion of subjects believing projects are an applicable vehicle for managing all business-led change than do public-sector organisations.

Corporate APM member organisations have a larger proportion of subjects believing projects are an applicable vehicle for managing all business-led change than do non-corporate APM member organisations.

Hypothesis testing the relationship between perceived applicability of project management and a subject's involvement in projects:

Subjects whose main project experience is working on "soft" projects are more likely to believe projects are an applicable vehicle for managing all business-led change than subjects whose main project experience is working on "hard" projects.

2.5.2.4 Features of a Project Environment

There are descriptions of features of a project environment, as distinct from a traditional, hierarchical and functional environment. These descriptions are made in the context of an increase in the use of project management and an increase in focus on projects, in all types of organisation. The existence of such features is considered by answering the next research question.

Research question; *To what extent do features of a project environment exist in organisations?*

2.5.2.5 Usefulness of Project Management

As part of the changes in project environments that occur when project management is used more extensively in organisations there are suggestions that the specific uses of project management broaden. Traditional uses may include the delivery of time, cost and quality objectives on individual projects, whilst new uses may include the facilitation of innovation and creativity within an organisation. Investigation of the extent to which project management is used in new areas is the rationale for the next research question.

Research question: *How do organisations use project management?*

The extent to which uses of project management are associated to a variety of factors are tested through the hypotheses detailed below. In terms of organisation-related factors, the aim is to test the extent to which the degree of project focus relates to a broad range of uses, and the extent to which the function in which a subject works relates to uses in new ways. In terms of work-related factors, the hypotheses aim to test both the relationship between a subject's involvement in projects and new uses of project management and the relationship between uses and change programmes witnessed.

Hypothesis testing the relationship between uses of project management and the characteristics of an organisation:

Organisations with a strong project-focus make more use of project management than do organisations with no strong project-focus.

Hypotheses testing the relationship between uses of project management and the part of an organisation a subject works in:

Subjects working in a project management function make more use of project management to build new knowledge than do subjects working in other functions.

Subjects working in a project management function make more use of project management to facilitate creativity than do subjects working in other functions.

Hypotheses testing the relationship between uses of project management and a subject's involvement in projects:

Subjects whose main role in projects is as a programme/project manager make more use of project management to build new knowledge than do subjects with other main project roles.

Subjects whose main role in projects is as a programme/project manager make more use of project management to facilitate creativity than do subjects with other main project roles.

Subjects involved in the development of project management processes/ procedures make more use of project management to identify business-related issues than do subjects with no such involvement.

Subjects involved in the development of project management processes/ procedures make more use of project management to control management processes than do subjects with no such involvement.

Hypotheses testing the relationship between uses of project management and change programmes witnessed by a subject:

Subjects who have witnessed, in their opinion, a TQM programme with a positive effect make more use of project management for the management of a continuous improvement programme

Subjects who have witnessed, in their opinion, a TQM programme with a positive effect make more use of project management for the measurement of a continuous improvement programme

2.5.2.6 Benefits Anticipated from using Project Management

Benefits have been claimed in the literature relating to the use of project management. Though these claims are not easily verifiable and could be simultaneously attributable to a number of factors, the anticipation of potential benefit may be important in relation to the process of increasing the use of project management, especially if part of this process includes the selling of potential benefits. Understanding how organisations anticipate benefiting from the use of project management, and how such benefits vary depending the characteristics of an organisation and a subject's involvement in projects, leads to the research question and hypotheses below. It is hypothesised that the organisation types listed are more involved in projects and, therefore, may anticipate higher levels of benefit than other types of organisation. It is also hypothesised that specific sorts of involvement in projects, such as the development of project management processes, is linked to levels of anticipation.

Research question: *How do organisations anticipate benefiting from the use of project management?*

Hypotheses testing the relationship between anticipated benefits from the use of project management and the characteristics of an organisation:

Organisations with a strong project-focus anticipate higher levels of benefit from the use of project management than do organisations with no strong project-focus.

Manufacturing organisations anticipate higher levels of benefit from the use of project management than do service organisations.

Private-sector organisations anticipate higher levels of benefit from the use of project management than do public-sector organisations.

Corporate APM member organisations anticipate higher levels of benefit from the use of project management than do non-corporate APM member organisations.

Hypotheses testing the relationship between anticipated benefits from the use of project management and a subject's involvement in projects:

Subjects whose main project experience is working on “soft” projects anticipate higher levels of benefit from the use of project management than do subjects whose main project experience is working on “hard” projects.

Subjects whose main role in projects is as a programme/project manager anticipate higher levels of benefit from the use of project management than do subjects with other main project roles.

Subjects involved in the development of project management processes/procedures anticipate higher levels of benefit from the use of project management than do subjects with no such involvement.

Subjects with an overseeing/multi-project role anticipate higher levels of benefit from the use of project management than do subjects with no such role.

2.5.2.7 Obstacles to the Use of Project Management

Discussions of the obstacles to the use of project management in organisations focus on the problems of introducing an initiative involving major cultural or structural changes. In this respect an initiative to introduce project management is equated with other major change programmes, such as TQM and business process re-engineering. A further issue, which has not been considered in any detail, is the extent to which obstacles specifically relate to perceptions of project management, with such obstacles being specific to any potential project management-related change programme. This issue is considered through investigating the next research question.

Research question: *To what extent do anticipated obstacles to the use of project management reflect perceptions of the nature of project management?*

2.5.3 Project Structures

2.5.3.1 Structures for Managing a Project

The literature contains descriptions of a variety of structures used to manage a project, ranging from traditional structures, such as matrix and dedicated project team, to newer structures, such as hybrids and networks. These new structures are described in the context of organisations increasing their focus on projects and, hence, the use of project management. The following research question focuses on investigating the extent to which such structures exist in practice.

Research question: *How do organisations structure themselves to manage projects?*

Benefits have been claimed relating to the use of the structures described above. The validity of such claims is the focus of the next research question.

Research question: *To what extent do subjects perceive benefits from their project structures?*

2.5.3.2 Structures for the Strategic Co-ordination of Multi-Projects and for the Centralised Support of Project Management Activities

As organisations increase their focus on projects and, consequently, manage a larger number of projects concurrently, the existence of structures for the strategic co-ordination of multi-Projects and for the centralised support of project management activities were highlighted. The next two research questions aim to investigate whether such structures exist in practice.

Research question: *To what extent do structures exist for the strategic co-ordination of multi-projects?*

Research Question: *To what extent do structures exist for the centralised support of project management activities?*

Related to these two research questions are a number of hypotheses, stated below. The aim of the hypotheses is to investigate the relationship between such structures and the characteristics of an organisation. It is hypothesised that certain types of organisation are more likely to have structures for the strategic co-ordination of multi-projects or for the centralised support of project management activities than other organisations. This is based on an assumption that the level of focus, importance, or scope of project management might influence the need for such structures. In addition, these levels might vary between different types of organisation.

Hypotheses testing the relationship between the existence of structures for the strategic co-ordination of multi-projects and the characteristics of an organisation:

Organisations with a strong project-focus are more likely to have structures for the strategic co-ordination of multi-projects than organisations with no strong project-focus.

Manufacturing organisations are more likely to have structures for the strategic co-ordination of multi-projects than service organisations.

Private-sector organisations are more likely to have structures for the strategic co-ordination of multi-projects than public-sector organisations.

Hypotheses testing the relationship between the existence of structures for the centralised support of project management activities and the characteristics of an organisation:

Organisations with a strong project-focus are more likely to have structures for the centralised support of project management activities than organisations with no strong project-focus.

Manufacturing organisations are more likely to have structures for the centralised support of project management activities than service organisations.

Private-sector organisations are more likely to have structures for the centralised support of project management activities than public-sector organisations.

2.5.3.3 Structures for Selecting People to Undertake Project Roles

The literature provides details of the importance of selecting the right people to fulfil a variety of project roles. In this context, there are suggestions that the development of structures for selecting people to undertake project roles, such as resource pools, supported by skills or competencies databases, is a worthwhile activity. Consideration of the extent to which such structures exist and, where developed, their usefulness and characteristics, leads to the following research question.

Research question: *How do organisations develop structures to select people to undertake project roles?*

In terms of considering the specific types of organisation in which structures for selecting people to undertake project roles are more likely to be developed, the literature indicates that the degree of project-focus might be the key factor. This is tested by the hypothesis below.

Hypotheses testing the relationship between the existence of formal structures for selecting people to undertake project roles and the characteristics of an organisation:

Organisations with a strong project-focus develop formal structures for selecting people to undertake project roles more than do organisations with no strong project-focus.

2.5.3.4 Structures for Developing People to Undertake Project Roles

In terms of developing people to undertake project roles, the need to provide a variety of stakeholder groups with the necessary skills, through training in a broad range of technical and non-technical areas, is highlighted. In addition, there is a suggestion that the characteristics of an organisation's environment can influence the focus of training activities. The existence and nature of structures to support such activities, and the influence of the organisation environment, are considered in the next research question.

Research question: *How do organisations develop structures to develop people to undertake project roles?*

2.5.3.5 Matching Capability to Provide People to Undertake Project Work to Demand

The literature introduces two perspectives in relation to the selection and development of people to undertake project work. Firstly, the perspective of an individual project, which has a relatively short time scale and, secondly, the perspective of the organisation in terms of managing future project, which has a relatively long time scale. The second perspective introduces the issue of an organisation's capability to learn, and, in doing so, increase its capability to provide people with the necessary skills and experience to work on projects. In learning organisations one might expect increases in capability to be achieved by methods other than an increase in resources, relative to the amount of project work undertaken. An investigation of the strategies used to match capability to potential demand forms the next research question and set of hypotheses. It is hypothesised that the organisation types listed below are more likely to have experience of undertaking projects. In addition, increases in capability will be associated with having such experience.

Research question: *How do organisations develop strategies to match their capability to provide people to undertake project roles to demand?*

Hypotheses testing the relationship between an increase in capability to supply enough of the right people to carry out project work and the characteristics of an organisation:

Organisations with a strong project-focus are more likely to see an increase in their capability to supply enough of the right people to carry out project work than organisations with no strong project-focus.

Manufacturing organisations are more likely to see an increase in their capability to supply enough of the right people to carry out project than service organisations.

Private-sector organisations are more likely to see an increase in their capability to supply enough of the right people to carry out project than public-sector organisations.

2.5.3.6 Structures for the Evaluation of Performance on Projects

There are indications that, as they become more project-focused, organisations need to structure themselves to allow an individual's project performance to be linked to appraisal systems. There are also indications that such a link, in many organisations, is difficult to make. The existence and nature of such structures is considered in the following research question.

Research question: *To what extent do organisations integrate structures for reward and recognition with performance of project roles?*

2.5.4 Project Management Systems

2.5.4.1 Evolution of Project Management Systems

The literature review suggests that a broadening of the use of project management may require the establishment of a company-wide project management system. There are further suggestions that such project management systems evolve through the following key stages: recognising and selling the need to change and the benefits of using project management, establishing a centralised project management system, and, finally, the relaxation of centralised control. The development of such systems is investigated through the following research question.

Research question: *How do project management systems evolve in organisations?*

2.5.4.2 Project Life Cycle Models

It is possible to view the use of models of the project life cycle from a broader perspective than merely defining a business process. For example, the benefits of providing a system of shared values, a baseline of understanding and a handle on the business culture, have been attributed, in some sources, to such models. The next research question focuses on investigating the validity of such claims.

Research question: *How do models of the project life cycle contribute to the management of projects in organisations?*

In terms of the influence of organisation type on the use of models for managing the project life cycle, there are suggestions in the literature that the degree of focus on project work may be important. The relationship between these two variables is examined in the following the hypothesis.

Hypothesis testing the relationship between the use of a model of the project life cycle and the characteristics of an organisation:

Organisations with a strong project-focus use a model of the project life cycle more often than organisations with no strong project-focus.

2.5.4.3 Formalising of Project Life Cycle Activities

The theoretical importance of formally carrying out, and sequencing, broad life cycle activities, such as identifying key project success criteria and identifying project critical success factors, are highlighted in the literature. The degrees to which such activities take place in practice, and their nature, if indeed they exist, is considered in the next research questions.

Research question: *To what extent do organisations formalise activities during the life of a project?*

Research Question: *How do organisations sequence activities during the life of a project?*

2.5.4.4 Project Classification

The review of the literature confirms the need for a contingent approach in terms of the methods selected to manage an individual project, even in the context of developing a company-wide, or strategic, approach to project management. Therefore, project classification can be seen as not only being a means of labelling different types of project, but also leading to the selection of appropriate project management methods. In terms of the criteria used, theoretical classification models developed for this purpose have their limitations and have not been tested in practice. The issue of project classification is considered in the following research question which, importantly, focuses on the uses of the classification process as well as the specific classification criteria employed.

Research question: *How does the selection of criteria for classifying projects contribute to the management of projects in organisations?*

2.5.4.5 Important Project Success Criteria

The project management literature highlights a consensus of opinion that the perceptions of key stakeholders are an important, if not over-riding, measure of project success. The literature also highlights the fact that there are various stakeholder groups, both internal and external to the organisation, whose perceptions, and hence influences, may be important in determining whether a project is ultimately deemed as successful. In addition, there are various potential criteria for measuring project success, including short-term

project-specific, long-term organisation-specific, task oriented and psychosocial oriented measures. Consideration of the extent to which practitioners use different measures of success leads to the following research question.

Research question: *How do organisations define project success?*

Related to this research question are a number of hypotheses. These hypotheses aim to test the extent to which the characteristics of an organisation and a subject's involvement in projects are linked to the levels of importance attached to project success criteria. It is hypothesised that the importance attached to specific measures may be linked to an organisation's environment, for example being in the private sector or the public sector, or it may be linked to a subject's involvement in project work, for example having an overseeing role.

Hypotheses testing the relationship between the rankings of project success criteria and the characteristics of an organisation:

Organisations with a strong project-focus attach different relative levels of importance to project success criteria compared with organisations with no strong project-focus.

Manufacturing organisations attach different relative levels of importance to project success criteria compared with service organisations.

Private-sector organisations attach different relative levels of importance to project success criteria compared with public-sector organisations.

Hypotheses testing the relationship between the rankings of project success criteria and a subject's involvement in projects:

Subjects with an overseeing/multi-project perspective involvement in projects attach different relative levels of importance to project success criteria compared to subjects with no such involvement.

Subjects with a direct, day-to-day involvement in projects attach different relative levels of importance to project success criteria compared to subjects with no such involvement.

Subjects with an involvement in the development of project management processes/procedures attach different relative levels of importance to project success criteria compared to subjects with no such involvement.

A further set of hypotheses explores the relationship between a subject's involvement in projects and the importance attached to individual success criteria. It is hypothesised that the relative importance of certain criteria is linked either to a subject's project experience or involvement in carrying out certain roles.

Hypotheses testing the relationship between the rankings of specific project success criteria and a subject's involvement in projects:

Subjects with an overseeing/multi-project perspective involvement in projects attach more importance to the growth of others than do subjects with no such involvement.

Subjects with an overseeing/multi-project perspective involvement in projects attach more importance to personal, non-financial rewards than do subjects with no such involvement.

Subjects with an overseeing/multi-project perspective involvement in projects attach less importance to personal, financial rewards than do subjects with no such involvement.

Subjects with a direct, day-to-day involvement in projects attach less importance to personal, non-financial rewards than do subjects with no such involvement.

Subjects with a direct, day-to-day involvement in projects attach less importance to the growth of others than do subjects with no such involvement.

Subjects with a direct, day-to-day involvement in projects attach more importance to their own personal growth than do subjects with no such involvement.

Subjects with an involvement in the development of project management processes/procedures attach more importance to personal, non-financial rewards than do subjects with no such involvement.

Subjects with an involvement in the development of project management processes/procedures attach less importance to the level of disruption caused by project work than do subjects with no such involvement.

Subjects with an involvement in the development of project management processes/procedures attach more importance to the improvement in organisational capability than do subjects with no such involvement.

Subjects whose main project experience is working on "hard" projects attach more importance to avoidance of non-benefit through early cancellation than do subjects whose main project experience is working on "soft" projects.

Subjects whose main project experience is working on "hard" projects attach more importance to the adherence to defined procedures than do subjects whose main project experience is working on "soft" projects.

Subjects whose main project experience is working on "hard" projects attach less importance to personal non-financial rewards than do subjects whose main project experience is working on "soft" projects.

2.5.4.6 Methods for Managing Project Success Criteria

Identification of the project success criteria used by key stakeholders is an important part of a process to manage project success criteria, and so demonstrate that a project is successful. The next research question considers how the relative importance attached to different success criteria is reflected in the methods employed to manage the project life cycle. For example, the literature suggests that the overall satisfaction of the client/customer, in terms of their perception of the success, or otherwise, of a project is the overriding criterion used. It is hypothesised, then, that if the importance of client/customer perception is recognised by practitioners it will be reflected in the existence of methods for

measuring and managing such perceptions. In terms of the types of organisation in which such methods are likely to be found, it is possible that project management experience, perhaps indicated by a high degree of focus on project work, might be a likely factor. This is tested by the hypothesis following the research question.

Research question: *How do organisations integrate the management of project success criteria into methods for managing the project life cycle?*

Hypothesis testing the relationship between the methods used for managing project success criteria and the characteristics of an organisation:

Organisations with a strong project-focus use more formal methods to manage the project success criteria perceived as important compared with organisations with no strong project-focus.

2.5.4.7 The Formalising of Project Roles

The influence of stakeholder groups on the successful completion of a project or its eventual failure has been highlighted. Discussions of methods to ensure the influence is positive, and linked to success rather than failure, identify the importance of involving stakeholders during the life of a project. One strategy to help ensure such involvement is to formally allocate certain roles to people or groups. The extent to which such strategies exist in practice is considered in the next research question.

Research question: *To what extent do organisations formalise project roles?*

2.5.4.8 Relevant Project Critical Success Factors

There are suggestions in the literature that differing levels of importance are attached to project critical success factors by different groups of stakeholders. There are also various classes of factors, such as those relating to the project, to the project manager/project team, to the organisation and to the external environment. Consideration of the extent to which practitioners regard particular factors as being relevant to their environments forms the basis for the following research question.

Research question: *To what extent are factors associated with the project, the project manager/team, the organisation and the external environment perceived as influencing project success?*

Related to this question are a number of hypotheses, which aim to test the potential influence of the organisation and work environments on the perceived relevance of the various factors.

Hypotheses testing the relationship between the rankings of project critical success factors and the characteristics of an organisation:

Organisations with a strong project-focus attach different values to the relative levels of relevance of project critical success factors compared with organisations with no strong project-focus.

Manufacturing organisations attach different values to the relative levels of relevance of project critical success factors compared with service organisations.

Private-sector organisations attach different values to the relative levels of relevance of project critical success factors compared with public-sector organisations.

Hypotheses testing the relationship between the rankings of project critical success factors and a subject's involvement in projects:

Subjects with an overseeing/multi-project perspective involvement in projects attach different values to the relative levels of relevance of project critical success factors compared to subjects with no such involvement.

Subjects with a direct, day-to-day involvement in projects attach different values to the relative levels of relevance of project critical success factors compared to subjects with no such involvement.

Subjects with an involvement in the development of project management processes/procedures attach different values to the relative levels of relevance of project critical success factors compared to subjects with no such involvement.

2.5.4.9 Methods for Managing Project Critical Success Factors

The literature suggests that the first step in an effective process for managing project critical success factors is the identification of those factors likely to be most relevant. In general terms, those most likely to be relevant deal with people issues and subsequent activities will focus on managing such issues. This suggests possible ways of distinguishing methods, for example, the degree of focus on people issues. Other distinguishing characteristics may exist. Previously it was suggested that maturity in the use of project management might be characterised by the establishment of formal structures, especially in project-focused organisations. The next research question and hypothesis focus on investigating whether a similar variation in the formality of methods for managing project critical success factors exists.

Research question: *How do organisations integrate the management of project critical success factors into methods for managing the project life cycle?*

Hypothesis testing the relationship between the methods used for managing project critical success factors and the characteristics of an organisation:

Organisations with a strong project-focus use more formal methods to manage the project critical success factors perceived as relevant compared with organisations with no strong project-focus.

2.5.4.10 Project Management Processes/Procedures

In terms of the processes and procedures for managing the life cycle of a project, the review of the literature highlighted the emphasis on upstream and downstream activities. Such an emphasis might be reflected by the existence of formally documented project management processes and procedures relating to such activities. This is the focus of the next research question.

Research question: *To what extent do organisations formalise their project management processes/ procedures?*

In a similar fashion to the use of project life cycle models, discussed in section 2.5.3.2 above, it is hypothesised that the degree of project focus in an organisation might be important in terms of the formalisation of project management processes/procedures. This relationship is tested by the following hypothesis.

Hypothesis testing the relationship between the formalisation of project management processes/procedures and the characteristics of an organisation:

Organisations with a strong project-focus formalise their project management processes/procedures more than do organisations with no strong project-focus.

A number of factors relating to both the characteristics and the operation of any formal processes/procedures may influence their value. These factors include the scope, number and flexibility of the processes/procedures. Investigation of the way project management processes/procedures are developed and used forms the next research question.

Research Question: *How do organisations develop strategies to ensure their documented project management processes/procedures add value?*

2.5.4.11 Project Management Software

The literature suggests that as organisations broaden their uses of project management there is a requirement for automated project management information systems.

There are also suggestions that the development of such systems is problematic. The following research questions aim to investigate the degree to which such systems exist and, where in existence, how appropriate is their development to contemporary project environments. The hypothesis in this section tests the extent to which the existence of such systems may be linked to the degree of project-focus in an organisation, with it being suggested that project-focused organisations are more likely to automate their information systems than non project-focused organisations.

Research question: *To what extent do organisations automate their project management information systems?*

Hypothesis testing the relationship between the automation of the project management information system and the characteristics of an organisation:

Organisations with a strong project-focus automate their project management information system more than do organisations with no strong project-focus.

Research Question: *How do organisations develop their automated project management information systems?*

2.5.4.12 Benchmarking of Project Management

The review of the literature highlighted a possible link between the disciplines of project management and quality management. In this context the usefulness of benchmarking activities aimed at facilitating the continuous improvement of the project management process were discussed. The final set of research questions consider the extent to which such activities exist and, where in existence, the nature of such activities. It is also hypothesised that benchmarking activities may be indicative of a highly developed approach to project management, that focuses on the quality of process as well as the quality of product, and, therefore, may be more likely to be found in organisations with great experience in undertaking projects.

Research question: *To what extent do organisations benchmark project management?*

Hypothesis testing the relationship between the benchmarking of project management and the characteristics of an organisation:

Organisations with a strong project-focus benchmark project management more than do organisations with no strong project-focus.

Research Question: *How do organisations develop their benchmarking activities?*

2.6 Concluding Remarks

The literature review in this chapter tends to confirm the view that there is a lack of empirical study of various claims made, and developments described, in relation to the discipline of project management. This suggests that research into the claims and developments is necessary.

In broad terms, these claims and developments suggest changes in the use of project management and the existence of project management related structures and systems. Amongst those empirical studies that have been carried out, a re-occurring limitation is the lack of comparison of experiences across a variety of organisation and work environments. Therefore, an investigation of the influence of factors such as the characteristics of an organisation and an employee's work experience, on developments in project management uses, structures and systems, seems to be a worthwhile area for further research.

The literature review highlights that within the broad areas of project management uses, structures and systems, there are a great number of specific issues for possible consideration. In order to give a comprehensive treatment of the subject matter, the broad nature of the potential area of study is reflected in the large number of research questions and research hypotheses developed in the Statement of the Problem section following the review of the literature. Therefore, the development of a research approach and a research methodology needs to consider how best to collect and analyse data from a wide variety of business, organisation and work environments, whilst, at the same time, covering a broad range of disparate topics. This issue is addressed in the next chapter.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

The previous chapter highlighted a body of opinion that there have been developments in the field of project management, in terms of its use and the structures and systems developed to support its use. However, many of these views are expressed in largely theoretical terms. There is a need to build upon the current literature and develop views based on theory and actual practice. In terms of theories relating to the development of project management, there is agreement that the developments incorporate people, structural and systems elements. A research approach is required allowing an investigation of these disparate elements

Empirical studies have been carried out, though these studies have focused either, on project management practice in generic terms or, on practices in individual organisations. There is the possibility that developments described in the literature may vary depending upon the environment in which projects are undertaken; yet few studies to date have considered the influence of the environment on project management practice. Practices may also vary depending upon differences in the application of project management principles. This suggests that an investigation of project management needs also to consider the reasons for possible variations in practice.

In developing a research approach, careful consideration must be given to how best to collect and analyse data covering possible differences in project management practice. A solution would seem to be to focus the research on ensuring diversity in the sample, in terms of business environments, organisation characteristics and the work environments of subjects. Such diversity will ensure potential differences in practices can be identified and will facilitate the analysis of any influences on the different identified.

As well as considering developments in project management, in terms of its use, structures and systems, and the influences on such developments, a study of views based on actual practice may lead to some suggestions as to modifications of existing theory. In order to

carry out such theory modification activities, the research approach needs to ensure that the study of actual practices has a strong and clearly defined theoretical framework.

The adoption of a research approach, and the selection of a research methodology, can be viewed from three broad perspectives. The first perspective is linked to the essential requirement of investigating actual practice across a variety of business, organisation and work environments. This issue is particularly considered in Section 3.2 through the construction of a number of matrices. The second perspective is linked to the need to select a methodology that enables the dissemination of a potentially large amount of data, covering a wide variety of disparate topic areas, from subjects in a number of different work environments. The final perspective relates to ensuring the investigation has a clear theoretical framework and that the framework incorporates the wide variety of topic areas.

3.2 Development of Approach

In terms of investigating project management practice, potential influences can be grouped into three broad areas: the business sector in which an organisation operates, the characteristics of the organisation, and the work environments in which individual employees operate. These three areas are inter-linked; employees work in different types of work environments within an organisation and different types of organisation may be found in particular business sectors.

The initial objective in the development of a research approach is to ensure that there is diversity in terms of each individual area (for example, the selection of organisations from a variety of business sectors). Furthermore, it is necessary to obtain, where possible, diversity at the boundaries between areas (for example, selecting different types of organisation within any one business sector). The requisite diversity can be achieved by the use of two-dimensional matrices. The matrices will also ensure there is no unintended bias in the sample in terms of representation in any one area (or between two areas). However, the need to survey the opinions of industry practitioners from the field of project management suggests the necessity of a degree of intended bias in terms of the proportion of subjects sampled from project management functions within an organisation.

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Table 3.2.1 shows the matrix used to ensure cross-sectional representation in terms of the business sectors and the characteristics of the organisations selected for the survey. Two matrices are used to ensure diversity in a subject's work environment. The first matrix ensures a balance of subjects, carrying out different types of project work, are obtained from a variety of functional work areas (see Table 3.2.2). The second matrix ensures a balanced representation is obtained of subjects, from different functions, undertaking different project roles (see Table 3.2.3). As the survey is undertaken, the business sectors, organisation characteristics and work environments of the participating subjects will be recorded on these three matrices. The sample subsequently obtained will be based on the need for a range of organisations and employees across these dimensions. (The completed matrices are presented in Chapter 4.)

Table 3.2.1: Matrix of Business Environment and Organisation Characteristics

Type of Business	Size (Large/Small)	Type of "Product" (Service/Manufacturer)	Organisation Status (Public/Private)
Automotive etc etc			
Totals			

Table 3.2.2: Matrix of Function and Main Project Work Area

Main Area of Project Work	Project Management	Information Technology	Service Operations etc etc
Construction etc etc			
Totals			

Table 3.2.2: Matrix of Function and Main Project Role

Main Project Role	Project Management	Information Technology	Service Operations etc etc
Project Manager etc etc			
Totals			

3.3 Research Approach

In establishing an appropriate research strategy, Easterby-Smith et al (1991: 21) state it is useful to understand philosophical issues. They give three reasons for having some knowledge of philosophy. Firstly, it underpins the overall research design, including the type of evidence to be gathered, the approach to interpreting the evidence and the methods for collecting and analysing data. Secondly, it facilitates an understanding of alternative research designs. Thirdly, it provides a framework for choosing an appropriate research design given the specific subject or knowledge structure.

Philosophical issues are usually discussed in the context of two main traditions, Positivism and Phenomenology. Saunders et al (1997: 71) identify a number of distinguishing features of positivist research: it is deductive (involving the testing of a hypothesis by observation under controlled conditions), it usually involves the collection and analysis of quantitative data and it uses highly structured methodologies to facilitate replication. By comparison the focus of phenomenology research is on explaining why people have different experiences rather than seeking to establish causal relationships and fundamental laws through the testing of a hypothesis. In terms of research practice, Easterby-Smith et al (1991: 22) concluded that "...there are many researchers, especially in the management field, who adopt a pragmatic view by deliberately combining methods drawn from both traditions".

The research design described in the remainder of this chapter is based on principles from both Positivism and Phenomenology philosophies. In considering how the attitudes of industry practitioners influence understanding of project management the research design is, in part, drawing from the Phenomenology approach to research. The collection and analysis of attitudes will also draw upon the Positivist philosophy, with truth or falsity of hypotheses being tested.

3.4 Research Strategy

Having formulated a set of hypotheses, a strategy needs devising for the hypotheses to be tested. Saunders et al (1997: 74 - 81) describe the three traditional research strategies as experiment, survey and case study. An experimental strategy is based on laboratory type research used in natural sciences.

Given the nature of the research being carried out in this work, the experimental strategy does not seem appropriate. To consider different business, organisation and project environments it seems sensible to establish a strategy based on the carrying out of fieldwork, rather than laboratory-based work.

Hutton (1988: 8) says survey research is the method of collecting information by questioning a sample of individuals drawn so as to be representative of a defined population. The purpose of survey research can be “descriptive” and/or “analytical/explanatory” (Ghauri et al 1995: 58 - 60). Descriptive research aims to provide an accurate profile of chosen phenomena, whether it is people, events or situations. In contrast, analytical studies seek to understand the relationships between variables. Saunders et al (1997: 78) state that, as more than one research strategy may be employed, there may be more than one purpose. In addition, the purpose may change over time, with a descriptive study leading to analytical study.

This study uses a survey research approach with both an analytical and descriptive purpose. There is a need to obtain actual experiences of subjects from a wide cross-section of business, organisation and work environments. The main focus will be on analysing data collected, and on understanding the relationships between variables. For example, it considers the relationships between independent variables in the business, organisation and project environment and dependent variables, such as the project management practices adopted by organisations. However, in order to carry out the analysis there is a need for some descriptive research, particularly in terms of defining project management practice.

The final type of research strategy is the case study. Black (1994, 40) defines a case study as the “development of detailed, intensive knowledge about a single “case”, or a small number of related “cases”.” A case study strategy is a means of gaining a richer understanding of the context of the research. As stated previously, a survey seems an appropriate method for obtaining information from a variety of business, organisation and project environments. However, richness may be added to the information obtained from these different environments through the detailed study of a number of selected organisational “cases”.

A further question in choosing the research strategy is deciding upon the time perspective. Research that considers changes and developments over time will use longitudinal studies, whilst research that considers a particular phenomena at a particular time will use cross-sectional studies. This study focuses on investigating how business, organisation and project-related factors, and the attitudes of industry practitioners in different environments, help our understanding of the project management. As such a survey strategy employing a cross-sectional study seems appropriate with the matrices of business and organisation characteristics, being used to ensure an adequate cross-sectional sample is surveyed.

3.5 Survey Design

Having chosen a survey research strategy, supplemented with a case study method, the specific data collection device needs considering. Saunders et al (1997: 76) list questionnaires, organisation & methods (O & M), and interviews, as potential designs for a survey.

One approach to the research would be to carry out a series of interviews with industry participants from differing backgrounds. Bouque & Clarke (1994) state the advantages of this approach as: allowing for longer and more complex data collection, controlling the order in which data are obtained, and setting up patterns to skip data collection based on different responses from subjects. The main disadvantages of interviews are: the cost, time and complexity involved in collecting data, and the problem of ensuring the data collected in each interview solicits information comparable with data collected in other interviews. In contrast, a questionnaire ensures consistency and uniformity in approach to obtaining information from a disparate set of subjects. This is particularly important in this study as subjects will be selected from a cross-section of businesses, organisations and project environments and, as such, a questionnaire seems an appropriate data collection device for this study.

There are two broad types of questionnaire: interviewer-administered and respondent/self-administered.

As stated in the introduction to the chapter, this study will consider project management practice across a variety of business, organisation and work environments. The study will also investigate a wide range of behavioural, structural and systems issues. It is crucial that the survey design addresses these considerations and, given the amount, variation and potential complexity of the information required, an interviewer- administered questionnaire will be used as the data collection method.

Having an interviewer administer the questionnaire will allow problematic questions to be explained, and will allow the interviewer to elaborate upon points which are unclear to the respondent. It will also enable the clarification of the meaning of questions, and it will provide the opportunity to introduce the research topic and motivate the respondents to provide honest answers. It will also allow the interviewer to manage complex jumps in the questionnaire (i.e. if “yes” go to Section 2). Additionally it will provide the opportunity to explore some issues in more depth through the use of open-ended questions, and allow the interviewer to classify (or at least) clarify the responses to such questions into useful categories during the course of the interview.

The alternative would be to use a respondent/self-administered questionnaire. However, there is likely to be a number of potential problems with such an approach. There is a large amount of data to be collected and the nature of the research requires some analysis of qualitative data obtained through asking open-ended questions. If a respondent/self-administered questionnaire is used this will have an adverse effect on the response rate. In addition it will be difficult to ensure a cross-sectional sample is obtained with sufficient variability in terms of respondents’ business, organisation and project environments. It is also likely that the amount of information to be collected will require a lengthy questionnaire, which is best presented as interviewer-administered (Saunders et al 1997: 246). Additionally, the existence of different subgroups of respondent, based on their business, organisation and project environment, means the questionnaire may need to route respondents to different questions. This may require a number of complex skip patterns that would be more manageable through an interviewer-administered questionnaire.

3.6 Questionnaire Design

The detailed design of the questionnaire needs to be carried out with due regard to the areas to be investigated by the survey. In this respect it is useful to refer back to the subject matter of the research questions and the nature of the research hypotheses, stated in the previous chapter.

As was stated in the introduction to this chapter, the research approach must allow an investigation of a broad range of project management issues, incorporating behavioural, structural and systems elements. The design of the questionnaire needs to take place in this context. The specific elements to be investigated can be identified from the topics covered by the research questions. Therefore, taken from the headings contained in the Statement of the Problem section in Chapter 2, the specific topics for investigation are:

Uses of Project Management

- Development of Project Management
- Importance of Project Management
- Scope of Project Management
- Features of a Project Environment
- Usefulness of Project Management
- Benefits Anticipated from using Project Management
- Obstacles to the Use of Project Management

Project Structures

- Structures for Managing a Project
- Structures for the Strategic Co-ordination of Multi-Projects and for the Centralised Support of Project Management Activities
- Structures for Selecting People to Undertake Project Roles
- Structures for Developing People to Undertake Project Roles
- Matching Capability to Provide People to Undertake Project Work to Demand
- Structures for the Evaluation of Performance on Projects

Project Management Systems

- Evolution of Project Management Systems
- Project Life Cycle Models
- Formalising of Project Life Cycle Activities
- Project Classification
- Important Project Success Criteria
- Methods for Managing Project Success Criteria
- The formalising of Project Roles
- Relevant Project Critical Success Factors
- Methods for Managing Project Critical Success Factors
- Project Management Processes/Procedures
- Project Management Software
- Benchmarking of Project Management.

Given that the purpose of the research is to investigate the research questions in the Statement of the Problem, the areas to be included in the questionnaire can, in part, be developed by considering the data required relating to the subject areas of the research questions. To this end a table has been produced providing details of the topics for data collection through the questionnaire, with a rationale for a topic's inclusion (see Table 3.6.1).

In Table 3.6.1 the specific content of the questionnaire designed to investigate these topics has been grouped into the broad subject areas of people, systems and organisation. Although this is a useful classification in terms of emphasising the different broad elements incorporated within the discipline of project management, and to be considered in this research, it is worth noting that there are links and overlaps between the three areas. For example, the topic of stakeholder management, highlighted in the literature review of project management systems, incorporates "people" elements, in terms of identifying project success criteria, as well as "systems" elements, in terms of methods used to ensure project success criteria are met.

The individual research hypotheses, accompanying the research questions in the Statement of the Problem, focus on testing a number of possible influences on project management practice. Given that the purpose of the research is also to test these hypotheses, the areas to be included in the questionnaire also needs to consider the data required in relation to each individual hypothesis. Taken from Chapter 2, the possible influences are:

The characteristics of an organisation, including its business environment
A subject's involvement in projects
The part of an organisation a subject works in
The change programmes witnessed by a subject

Therefore, in order to test each hypothesis, part of the questionnaire will need to include collection of data relating to the following "environmental factors": business environment, characteristics of the organisation, the nature of a subject's work environment, and the characteristics of the project environment.

Table 3.6.1: Areas Covered by the Questionnaire

AREA COVERED	SPECIFIC DATA COLLECTION TOPIC	RATIONALE FOR INCLUSION IN QUESTIONNAIRE
ENVIRONMENTAL FACTORS		
Business Environment	Business sector of organisation	Different business sectors work in different environments and characteristics of these different environments might influence project management practice. Therefore, sampling organisations from different business sectors will ensure that data relating to the external environment, such as competitive pressures and the need to respond to a changing environment, are collected. There may also be variations in the degree of traditional project focus, and the type of project work undertaken, across the different business sectors. These variations may also influence project management practice and the level of maturity within organisations in terms of the utilisation of project management.
Characteristics of the Organisation	Organisation size, status (public sector or private), service provider or manufacturer, corporate member of The Association of Project Management (APM)	In a similar fashion to business sector, variations in the characteristics of an organisation may influence project management practice and the level of maturity in terms of the use of project management. There are a number of organisation variables that seem appropriate for data collection. Different approaches may be evident based on the size, perhaps in terms of number of employees, of the organisation. For example, one might expect a greater emphasis on multi-functional project teams and documented project management processes in large organisations (were cross-functional communication and control is perhaps more of an issue than in smaller organisations). Furthermore, whether the organisation is in the public sector or is privately owned, or whether it is a service provider or a manufacturer, might have an influence on the way project management principles are used and how they might be used in the future. For example, in general terms, private sector manufacturers might be expected to have more of a tradition of managing traditional project work than some public sector services. In this respect, the distinction between corporate members of the APM and other organisations might be significant, with one expecting corporate APM members to have more of a project-focus than other organisations, and hence to have well established project management practices.

(Continued on next page)

Table 3.6.1 (Cont.)

<p>Nature of a Subject's Work Environment</p>	<p>Subject's job title, length of service, function</p>	<p>Within a particular organisation subjects may work in different environments. For example, two employees might work for the same large-sized company manufacturing electronic components for the automotive industry. One employee might have lengthy service in the company and occupy a senior management position, the other might be relatively new to the company and occupy a junior position. Furthermore, one subject might work in a function directly responsible for manufacturing the products, whilst the other might work in a support function, such as information technology.</p> <p>It is likely that the differences in the individuals' environments, whether position in the organisation or function, might influence an individual's experiences of project management. It is also likely that perceptions of project management might vary depending upon the subject's "position" in the organisation. Therefore, it is appropriate to include the collection of data regarding a subject's work environment in the questionnaire.</p>
<p>Characteristics of the Project Environment</p>	<p>Subject's main project role, main project work area, project experience, project involvement</p>	<p>Likewise, within a specific work environment, two employees at the same managerial level within the organisation and working within the same function might have completely different experiences, and knowledge of, project management. As was the case with the work environment, these differences are likely to influence perceptions of project management. For example, an individual carrying out the role of project manager might have different opinions regarding the usefulness of project management compared to an individual in the same work area working as a project team member. It is necessary then to consider what data needs collecting in relation to a subject's project environment. The issue is complicated by the fact that an individual might be working on a number of different project types at any one time. Furthermore, they may have different roles on different projects. For example, they may be the project manager of a construction project and the project sponsor for an information systems project. To address this complexity it is perhaps useful to distinguish between the "primary" project role or work areas and any "secondary" involvement.</p> <p>The final issue in relation to a subject's project environment is the level of project management experience. In terms of collecting data of the opinions of project management practitioners, one must be careful to consider those opinions in light of the individual's project management experience. For example, a subject with a long history working as a project manager might be expected to be more knowledgeable about the detailed project management approach adopted by an organisation compared to a subject with a shorter history as a project sponsor.</p> <p style="text-align: right;">(Continued on next page)</p>

Table 3.6.1 (Cont.)

<p>Characteristics of the Project Environment (Cont.)</p>	<p>Subject's main project role, main project work area, project experience, project involvement (Cont.)</p>	<p>As such, it is necessary to collect data allowing an assessment of project management experience, with experience being based upon the length, breadth, and depth of involvement in projects.</p>
	<p>Customer/supplier relationships</p>	<p>As well as undertaking different project roles in the context of different project type a subject may work in a project environment with different customer supplier relationships. For example, an individual may work for a small company where projects are carried out for external customers. In a larger organisation, an individual might manage projects where the customer is another part of the organisation. Likewise, suppliers to a project, in the form of people or materials, might be external or internal. Given that the concept of stakeholders, of which customers and suppliers can be viewed as two of the most important, was a key principle highlighted in the literature review, collection of data about the relationship between customers, suppliers and a project organisation seems to be important. Such data will help analyse the influence of these relationships on the development of project management.</p>
	<p>Importance of projects to the organisation</p>	<p>In the discussion of the rationale for collecting data about the characteristics of the business environment in the questionnaire it was stated that the degree of project focus might change between business sector. The literature review also identified theories classifying organisations in terms of the importance of project work. For example, in some organisations projects make or break the organisation, whilst in other organisations projects are not important. In a similar fashion to degree of project focus, it is possible that variations in the level of importance of project work might influence both project management practice and the level of maturity of the use of project management within organisations. It seems appropriate then to collect data about the importance of projects within an organisation.</p>
	<p>Involvement in previous change management initiatives</p>	<p>Collecting data about the success, or otherwise, of previous change management initiatives may be important in understanding practitioners perceptions of the usefulness and effectiveness of project management. For example, the success of a TQM initiative may result in project management being perceived as useful to the TQM-related activities of managing and measuring continuous improvement.</p>

Table 3.6.1 (Cont.)

PROJECT MANAGEMENT (PM) PRINCIPLES		
People	Awareness of appropriateness of project management	<p>The literature review suggested that project management principles were appropriate for managing all types of business change; whereas, traditionally, project management was mainly used to manage traditional capital intensive, activities in areas such as construction and engineering. Collecting data about awareness, and agreement with, the broader view of the appropriateness of project management is useful for two reasons.</p> <p>Firstly, it perhaps provides an indication of the level of maturity of an organisation in terms of the use of project management (and the influences on maturity). Secondly, it allows an analysis of the extent to which awareness of the appropriateness of project management principles amongst individual practitioners influences the development of project management practice.</p>
	Perceptions of measures of success (project success criteria), perceptions of factors influencing success (project critical success factors)	<p>In a similar fashion to awareness of the appropriateness of project management principles, variations in perceptions of the importance of project success criteria and project critical success factors might provide an indication of the level of maturity of an organisation in terms of the use of project management. For example, it is possible that in organisations less mature in the use of project management measures of success focus exclusively on cost, quality and time. In organisations with more experience of project management other measures, such as customer perception might be more important. Likewise, the importance attached to the different critical success factors, such as the abilities of the project manager or the role of senior management, might vary in a manner similar to success criteria.</p>
	Criteria for selection, areas of development	<p>In the literature review the principle of stakeholder management was a central principle of project management systems. In addition, people working within project environments, as well as customers and clients, were seen as important stakeholders. Therefore, it is appropriate to include in the questionnaire collection of data concerning the criteria used to select people to fulfil project roles and the areas in which development, perhaps in the guise of formal training, is provided to enable individual's to carry out these roles. This data will facilitate analysis of some of the characteristics of project management practice.</p>

(Continued on next page)

Table 3.6.1 (Cont.)

<p>People (Cont.)</p>	<p>Criteria for selection, areas of development (Cont.)</p>	<p>It is also possible that an individual's treatment within the project environment might influence their opinions of project management. For example, an individual selected for a project based on an assessment of their skills and experience and then given project management training might have a positive attitude towards project management. Conversely, an individual selected to work on a project because there were no other available people and then given no training might have a negative attitude towards project management</p>
<p>Systems</p>	<p>People selection, performance evaluation, role definition, methods for managing success criteria, methods for managing critical success factors</p>	<p>Different project management practices might be distinguishable by the project management systems in place within an organisation. Based on the conclusions drawn from the review of the literature there are a number of elements of a project management system that warrant inclusion within the questionnaire.</p> <p>Given the importance attached to stakeholder management outlined in the previous section, it seems appropriate to collect data relating to any systems used to manage stakeholders – whether they are internal or external to the organisation. In terms of project team members, pertinent systems would be those used to select team members, identify and carry out their development, and, subsequently, monitor and evaluate their performance. It is possible that, within different project management practices, the nature of these systems may vary (in terms of whether they are present or absent or in terms of their levels of formality). In terms of all types of stakeholders, different practices may be characterised by different systems for defining project roles, identifying and managing stakeholders' criteria for success and identifying and managing the critical success factors.</p>
	<p>Life cycle models, project classification, project management procedures, project management information systems</p>	<p>The discussion of project management systems emphasises management of the whole project life cycle. Therefore, one might expect to find variations in project management practice to be characterised by different systems used specifically for managing the stages of the project life cycle. Therefore it is appropriate to include in the questionnaire the collection of data relating to both the management of the life cycle as a whole and also the management of the different stages. In this broad area one can distinguish between systems used to model the whole of the life cycle, systems used to classify projects before project start-up, systems used to manage information, and systems that incorporate the use of detailed project management procedures through a project's life (and beyond).</p> <p style="text-align: right;">(Continued on next page)</p>

Table 3.6.1 (Cont.)

Systems (Cont.)	Benchmarking project management processes	<p>In the literature review the potential cross-fertilisation between project management and TQM was discussed. Two common themes were the emphasis on quality of process (not just quality of product) and the importance attached to continuous improvement. A system designed to address both of these themes is that of benchmarking, with the emphasis being on benchmarking the processes used to deliver certain outputs rather than the outputs themselves. In the context of project management this involves benchmarking project management processes rather than project performance. It seems to appropriate then to include within the questionnaire collection of data relating to systems used to benchmark project management processes.</p>
Organisation	Project structures, multi-project structures, project support structures	<p>In a similar fashion to the topic of project management systems on the previous page, the literature review highlighted the fact that project management theories suggest that there are structural differences between organisations that are utilising project management principles and those that are not. For example, the use of project management may involve a change in the organisation towards flat, flexible, structures, with an emphasis on multi-functional teams. One might expect to find the nature of different project management practices, and different levels of maturity in terms of the use of project management, to be characterised by the existence of different structures. Therefore, it is appropriate to collect data about the different structures used in the organisation relating to project work. This would be the following areas: the management of individual projects, the management of multi-projects (programmes) and the support for individual projects</p> <p>In discussing characteristics of the project environment, the justification for collecting data about the importance attached to projects was based on the fact that variations in the level of importance of project work might influence both project management practice and the level of maturity in the use of project management. This justification is also valid in terms of the reason for collecting data relating to the both the status of project management in the organisation, in terms of the existence of an organisation for controlling projects, and to the existence of any changes in the use of project management principles. (These principles may be in the form of project teams, the use of projects or the use of project management methods.)</p>
	Uses of project management	<p>In a similar fashion to perceptions of the importance of project success criteria and project critical success factors, variations in the uses of project management might provide evidence of variations in project management practice and an indication of the level of maturity in terms of the use of project management.</p>

Table 3.6.1 (Cont.)

<p>Organisation (Cont.)</p>	<p>Capability to carry out project work</p>	<p>The inclusion in the questionnaire of individual's perceptions of an organisation's capability to carry out project work can be justified in terms of the influence of these perceptions on an individual's opinions concerning the usefulness of project management. For example, an individual who believes their organisation has increased its capability to carry out project work might have a more positive attitude towards project management than an individual who believes capability is decreasing. In addition, collecting data on organisational capability, in terms of carrying out project work, might also facilitate analysis of the applicability (and success) of variations in project management practice.</p>
<p>UTILISING PROJECT MANAGEMENT</p>		
<p>Benefits</p>	<p>Levels of anticipated future benefits</p>	<p>In order to be able to investigate the anticipated benefits of using project management it is necessary to collect data concerning the different areas of benefit. For example, one organisation with a particular focus might gain benefit in terms of increasing levels of creativity or innovation. Another organisation, with a different focus, might gain benefit through reduced costs or increased efficiency.</p> <p>potential.</p>
<p>Obstacles</p>	<p>Obstacles to increased use of project management principles</p>	<p>Given that there is general agreement that introducing project management often involves major changes within an organisation, an attempt to utilise project management principles more fully might well meet with resistance from employees. It is appropriate then to find out, through the questionnaire, what these potential obstacles are. This information will be particularly useful in developing suitable processes for increasing maturity in the use of project management.</p>

Careful consideration of the areas for inclusion in the questionnaire contributes to the collection of valid data. The validity and reliability of the data is also influenced by the design of the questionnaire. The design of the questionnaire was carried out with due attention to the areas of questionnaire focus, questionnaire phraseology, form of response, question sequencing, and overall presentation, which are identified by Gill & Johnson (1991: 84) as the five key areas of questionnaire design. The final questionnaire is shown in Appendix 3.1).

3.7 Piloting the Questionnaire

Saunders et al (1997: 254) state that the reliability and validity of any data collected by a survey will depend in part on the rigour of the pilot testing of the questionnaire. A lack of reliability due subject error may occur when the answer a respondent gives is influenced by an extraneous factor, such as the time of day. In this study the potential for subject error is probably related to the workload of the respondent. The questionnaire is demanding on a respondent's time and if the respondent feels completing the questionnaire is an unreasonable use of valuable time it might have a negative effect on both the completeness and accuracy of the data. To overcome this problem, care was taken when arranging interviews with respondents to ensure they were fully aware of the time required to complete the questionnaire; and that an adequate amount of time was reserved for the interview. In addition, when arranging to interview respondents, great emphasis was put on establishing a time and place that was most convenient to the respondent; particularly avoiding periods when the respondent was under unusually heavy workloads.

A lack of reliability due to subject bias, for example, giving answers that fit in line with their manager's views or with company policy, can be addressed, but not necessarily eliminated, by ensuring the anonymity of the respondent and by careful analysis of the data. In this research there are perhaps, a number of areas where there might be an issue of subject bias; mainly relating to the attitudes of industry practitioners towards "contentious" issues, such as the organisation's ability to manage change. The most appropriate approach to this seems to be to analyse the data as it is collected. By talking to respondents face-to-face it is possible to gauge, perhaps by off-the-cuff comments and body language, whether there is bias in an answer. Steps can then be taken to remove the bias (perhaps by repeating the question or asking a subject to reconsider their answer). If this fails the possible bias can be recorded and taken into consideration during the subsequent data analysis.

Observer error may occur if there are different approaches to collecting data at different times or by different people. In this research, the interviews are carried out by one person; so there is not a problem in terms of aligning the approach of different people. Additionally, the questionnaire is presented in a highly structured form, which minimises variations of approach from one interview to the next.

To consider the validity of the questions, Saunders et al (1997: 269) suggest focusing the piloting of an interviewer-administered questionnaire on a number of areas:

- Questionnaire length,
- Clarity of instructions,
- Unclear or ambiguous questions,
- Questions a respondent was uneasy about answering,
- Significant topic omissions,
- Any other comments.

In order to address these areas a two stage piloting process was designed. In the first stage of piloting, a draft copy of the questionnaire was given to four members of academic staff in John Moores University: one specialising in questionnaire design, another specialising in statistical analysis of data, and the two others experienced researchers. *One of the* experienced researchers was also knowledgeable in the field of project management. Feedback was received from each staff member and modifications were subsequently made to the questionnaire. In the second stage of the piloting, the modified questionnaire was administered to two people in Origin Management Systems and two people in the Alliance & Leicester Group. These were chosen as being representative of the type of people, in terms of involvement in projects, who would be involved in the research. Table 3.7.1 shows the areas addressed in terms of questionnaire validity in the piloting process. After completing the piloting process, some modifications were made to the draft questionnaire. No major substantive changes were made, with the focus being on question phrasing, terminology and sequencing, and some reduction in the questionnaire's complexity and length.

3.8 Sampling

3.8.1 Introduction

Having designed the questionnaire, the next area of consideration is the sample used to collect the data. Sekaran (1992: 226) defines a sample as "a subset of the population" and in this study we can perhaps define the population as "organisations' employees who have some involvement in projects". There are a number of areas to address in terms of sampling: the sampling technique, location of sample and sample size.

TABLE 3.7.1: AREAS OF FEEDBACK IN PILOTING PROCESS

AREA OF FEEDBACK	PHASE 1: ACADEMIC STAFF JOHN MOORES UNIVERSITY	PHASE 2: INDUSTRY PRACTITIONERS ORGIN/ALLIANCE & LEICESTER
Questionnaire length	Feedback	Feedback
Clarity of instructions	Feedback	Feedback
Unclear or ambiguous questions	Feedback	Feedback
Questions subjects were uneasy about answering	Not applicable	Feedback
Significant topic omissions	Feedback from academic staff member with subject expertise	Feedback
Any other comments	Feedback	Feedback

3.8.2 Sampling Technique

Saunders et al (1997: 124) define two types of sampling techniques: “probability or representative” sampling and “non-probability/judgemental” sampling. Deciding to use probability or non-probability sampling depends upon whether the degree to which the sample represents a population is critical for the study (Sekaran 1992: 239). If it is critical, a probability sample is used. If it is not critical, a non-probability sample is used. In this research the focus is on eliciting information from a disparate set of employees in a cross-section of businesses. Furthermore, it is not possible to obtain information about the wider population i.e. the number of employees who work in organisations and have some involvement in projects. Rather, the sample selected needs to ensure there is variety in

terms of a number of characteristics i.e. type of business. This would suggest a non-probabilistic sample is appropriate in this research.

Saunders et al (1997: 143) defines five types of non-probabilistic sample:

Quota, Purposive, Snowball, Self-selection, Convenience.

Purposive sampling involves using judgement to select cases that best enable the answering of the research questions. This seems an appropriate method for this research, as judgement is required in ensuring an appropriate cross-sectional sample is used. Purposive samples can be grouped into five categories:

Extreme case, Heterogeneous, Homogenous, Critical case, Typical case.

In investigating variations between business, organisation and project environments, heterogeneity seems to be the most important issue. Heterogeneous sampling involves ensuring there is maximum variation in the data collected, enabling the description and analysis of key themes. In carrying out a purposive heterogeneous sample, Saunders et al (1997: 146) state the desirability of identifying the diverse characteristics prior to selecting the sample. This can be done using the matrices discussed in Section 3.2. In choosing the sample of organisations and the employees to interview within organisations, an ongoing check can be made to ensure variation in the characteristics above.

3.8.3 Location of Sample

Given that the population from which the sample is to be drawn is “employees who have some involvement in projects”, it is necessary to contact people working in organisations where projects are being undertaken (or have been/will be undertaken). The most useful method for identifying potential sources of information was the author’s network of contacts in the area of project management. This network included contacts through: John Moores University, The British Computer Society, The Association of Project Management, and the author’s previous work experience. However, there is a danger that over-reliance on one particular contact might result in over-representation in one area. For example, over-use of contacts in The British Computer Society might result in an over-representation of subjects working on information technology projects. As such, care needs

taking in ensuring a non-biased, representative sample is obtained. (The matrices discussed in Section 3.2 were particularly useful in this respect.)

Using this network, contact was made with employees in a number of organisations. The objectives of the study and the required participation in terms of time were outlined; and the employee's suitability, in terms of their involvement in projects, was assessed. None of the people contacted refused to participate in the research. Based on the initial assessment the employee was either included in the sample to be interviewed, or in some cases the name(s) of other more suitable employees were provided by the employee. A meeting was subsequently arranged, either at the employee's place of work or at The Liverpool Business School. At that meeting the questionnaire was completed. At the end of this first meeting with an employee, the possibility of interviewing other employees in the organisation was discussed. If there were other possible employees, and it seemed appropriate in terms of the requirements of the sample and the contribution to the research aims, additional interviews in the same company were carried out.

3.8.4 Sample Size

In deciding upon a suitable sample size, the choice of a non-probabilistic sampling method means there is no requirement for a sample size to be achieved to allow generalisations to be made about the wider population with any statistically based degree of confidence. Rather it is a case of ensuring the sample size provides an adequate cross-section of respondents. However Sekaran (1992: 253) does state that as a rule of thumb "sample sizes larger than 30 and less than 500 responses are appropriate for most research". Given the research approach, and the amount and nature of the data collected from each questionnaire, it seems sensible, given time and cost constraints, to aim for a sample size towards the lower end of the size limit specified by Sekaran.

Although aiming for a sample size at the lower end of the 30 – 500 responses range, the parameters shown in the matrices in Section 3.2 determine certain minimum sample size limits. For example, there are nine classifications of types of business shown in Table 3.2.1. As a bare minimum, in order to include one organisation from each type of business, the sample would need to include at least nine different organisations. Likewise,

in order to include at least one subject from each of the main project work areas (see Table 3.2.2, the sample would need to have a minimum of 13 subjects. These minimum sample sizes are based on the requirements of one dimension of a matrix. There are also the requirements determined by consideration of two dimensions in a matrix. For example, there are 18 possible combinations between type of business and size of organisation in the matrix shown in Table 3.2.1. To include all combinations there would need to be a minimum of 18 organisations in the sample. In choosing the sample size, the key aim was achieving a balance between the level of representation required within a matrix, represented by the minimum sample size, and the time and cost constraints involved in obtaining data from the chosen sample.

3.9 Concluding Remarks

This chapter contains information about the research approach and the research methods used in the study. In order to achieve diversity in terms of the business environment, organisation characteristics and work environment of subjects, a set of three matrices have been developed.

The first matrix will be used to ensure the sample of subjects is varied in terms of the business sectors in which their organisations operate. Examples of the different business sectors are automotive, banking/financial services and public administration/ services. The first matrix will also allow a check of diversity in terms of the size (large/small), type of “product” (service/manufacture) and status (public/private) of these organisations. The second and third matrices focus on a subject’s work environment.

The second matrix ensures subjects from different functions of an organisation, who are involved in different project work areas, such as new product development and research & development, will be selected. Functions include Information Technology, project management and service operations.

Likewise, the third matrix will allow a check of diversity in terms of the different project roles carried out by subjects in different functions. Project roles include those that might be classed as having more of a direct day-to-day involvement in projects, such as project

manager and project team member, and those with a more indirect day-to-day involvement, such as functional manager supplying people to work on projects.

In terms of research approach and research method the chapter outlines the reasons for using a survey and for choosing an interview-administered questionnaire. This selection is justified in two broad areas. The need for diversity in terms of the business, organisation and work environments suggests a survey is more appropriate than a study of a small number of cases. Secondly, the large amount, variety and potential complexity of the information required in the study suggests a self-administered questionnaire is not the best method to use.

Having made these choices about approach and method the chapter provides details about the design of the questionnaire, in the context of obtaining valid and reliable data. The detailed design of the questionnaire needs to be carried out with due regard to the areas to be investigated by the survey and the chapter provides a rationale for including specific topics for data collection. The final section provides a rationale for using purposive heterogeneous sampling in the study. It also gives details of the location of the sample and suitable sample sizes.

In the next five chapters, data obtained from carrying out the designed survey will be used in a number of ways. In Chapters 5, 6 and 7 the results of the survey are presented. Chapter 5 focuses on presenting the survey results in terms of the use of project management. In Chapter 6 data are given of the different project management related structures. Chapter 7 presents data of the project management systems utilised. Finally, Chapter 8 contains a discussion of the survey findings, in the context of the research questions and research hypotheses detailed in the Statement of the Problem at the end of Chapter 2.

As emphasised in this chapter, the research approach requires a diverse sample. In describing the characteristics of the survey sample, the next chapter demonstrates how the necessary diversity has been achieved.

CHAPTER 4

RESULTS: DESCRIPTION OF SAMPLE

4.1 Introduction

As stated in the introductory section to Chapter 3, this study aims to build upon the project management literature and develop views based on theory and actual practice. The choice of a research approach and research methodology to meet this aim, discussed in the remainder of Chapter 3, was a survey, with an interview-administered questionnaire. Chapter 3 also provided a rationale for using a purposive heterogeneous sample when carrying out the survey.

In order to study actual practice it is necessary to consider the target areas in which the survey needs to collect data. The first issue is the choice of organisations to include in the survey. Organisations from different business sectors are likely to have different pressures within their environment. For example, organisations in the automotive business might be under intensive pressure from overseas competition, whilst organisations in the public sector might be under pressure from decreasing funding from central government. Therefore, in order to explore the influence of these, and other, pressures it is necessary to ensure heterogeneity in the sample of organisations in terms of their business environments.

The second issue is ensuring there is diversity in the sample in terms of the characteristics of those organisations selected. There are a number of organisation variables likely to influence project management practice. These include: the size of the organisation, whether the organisation is a service provider or a manufacturer, and whether the organisation is in the public or the private sector. As well as at the business sector level, heterogeneity is required at the organisation level.

In terms of the individuals selected for participation in the survey, one can view the target area as employees of organisations involved, either directly or indirectly, with projects. This is a broad area, potentially including employees who are full-time practising project managers, and employees who are involved on a part-time basis (perhaps as members of project steering committees). Given that the purpose of the sample is to survey actual

practice in project management, it is likely that some bias in the sample towards those with a direct involvement (and also a high level of experience) in project environments is appropriate.

However, this bias needs to be balanced by the heterogeneity required in the work and project environments of the employees selected. Without this heterogeneity it will not be possible to investigate the influence of these environments on project management practice. Possible work and project variables for inclusion in the data collection were discussed in the previous chapter. For example, within any particular organisation, subjects may work in different environments; with a possible distinction being between employees working in functions that are directly involved in manufacturing products or supplying services and those in areas that provide support for these functions, such as IT, finance and personnel. Employees might also carry out different project roles (and have different involvements) in different types of project work. A further potential for variety is in the length and breadth of employees' experience within project environments.

The survey results presented in this chapter describe the different business environments, organisation characteristics and work environments of the subjects sampled in the survey.

4.2 Business Environment

Twenty two organisations were selected from a number of business sectors to ensure that a variety of project environments would be surveyed. Within these 22 organisations the questionnaire was administered face-to-face to a total of 63 subjects, giving a subject: organisation ratio of approximately 3:1. This ratio was chosen for two reasons.

Firstly, interviewing more than one person in an organisation allowed more complete information about actual practice (and opinions) within that organisation to be obtained. Secondly, greater numbers of subjects, compared to organisations, were required to reflect the heterogeneity in the subjects' work and project environments. In terms of the number of organisations, the final sample resulted in at least one organisation representing each business sector (see Table 4.2.1). Likewise, the sample contained at least 2 subjects per different business sector.

Table 4.2.1: Business Sector of Organisations Surveyed

<i>Business Sector</i>	<i>No. of Organisations</i>	<i>No. of Subjects</i>
Defence/Aerospace	1	4
Chemicals/Energy	3	9
Automotive	1	2
Sundry Manufacturing	5	9
Information Systems	3	10
Banking/Financial Services	1	6
Education/Training/Consultancy	2	10
Public Administration/Services	4	11
Private Administration/Services	2	2
TOTAL	22	63

For purposes of identification the 22 organisations have each been given a one-letter identification from A to V. Subjects are given an alphanumeric identification that links them to the organisation they work for. For example, the 6 subjects interviewed from organisation A are identified as A.1, A.2, A.3, A.4, A.5. and A.6. Organisation and subject profiles are provided in Table 4.2.2.

The business classification used by The Association of Project Management ensures representation from traditional project-focused organisations, such as “chemicals/energy” and “defence/aerospace” (4 organisations and 13 subjects interviewed). It also ensures representation from organisations that have no strong tradition of managing projects, such as “education/training/consultancy” and “public administration/services” (6 organisations and 21 subjects interviewed). Although based on a rather subjective evaluation process, the business sectors shown in Table 4.2.1 have been, very loosely, arranged in terms of the degree of tradition of project focus; with those sectors most likely to have a history of focusing on project work towards the top of the table and those less likely to have a history of managing projects towards the bottom. However, care has to be taken in making such generalisations, as organisations not regarded as project-focused may have pockets of project management expertise in some specialist functions, such as the information technology function. The diversity in terms of business sector also ensures representation from organisations managing traditional “hard” projects, in such areas as construction and manufacturing, and organisations engaged in “softer” projects, such as the management of organisational change.

Table 4.2.2: Profiles of Organisations and Subjects

Org.	Profile of Organisation	Subject	Profile of Subject
A	Supplier of banking and other financial services.	A.1	Employed as Communications Services Manager in Group Information Services (a corporate function supporting the organisation's business units).
		A.2	Information Systems Manager. In charge of function responsible for the development of all corporate information systems.
		A.3	Carrying out role of Client Services Manager within Group Information Services. Function has specific responsibility for telecommunications and datacommunications within organisation.
		A.4	Business Consultant Manager. Manager within Group Strategic Planning and Consultancy. Responsible for all strategic planning and internal consultancy initiatives.
		A.5	Business Consultant in Group Strategic Planning and consultancy.
		A.6	Head of Group Programme Management. Responsible for all major, organisation-wide programmes.
B	Refines lead-based (and other associated) chemical compounds.	B.1	Maintenance engineer in department responsible for production of one particular chemical compound.
		B.2	Production engineer in same department as B.1.
		B.3	Works Engineer. Responsible for ensuring all production facilities are operational.
		B.4	Head of maintenance in same department as B.1.
C	Manufacturers and supplier of aerospace and defence products.	C.1	Head of Project Management in Systems and Services Group (a function carrying out prime contractor role on a major, long-term contract to an overseas customer)
		C.2	Employed as programme manager for the Aircraft Business Team (within Systems and Services Group).
		C.3	Senior Project Engineer in Systems and Services Group (Naval Ground Systems Business Team).
		C.4	Carrying out role of Engineering Manager within Aircraft Business Team.
D	Involved in nuclear fuel reprocessing.	D.1	Head of Project Management in Engineering Division (a function responsible for supporting the organisation's various reprocessing facilities).
		D.2	Employed as project manager in Project Procurement Group. This group has responsibility for all capital projects undertaken by the organisation.
		D.3	Head of Project Procurement Group. (Formerly Head of Engineering and Project Director).
		D.4	Head of Engineering Management Development in Corporate Engineering. Department is responsible for developing best practice across all functions in organisation.
E	Supplies both data and telecommunication services.	E.1	Customer Project Manager in Computer Services Department. Involved in managing computer projects on behalf of other functions in the organisation.

Table 4.2.2 (Cont.)

Org.	Profile of Organisation	Subject	Profile of Subject
F	Provides engineering training and consultancy.	F.1	Chemical engineer. Carries out training and consultancy in this area.
		F.2	Consultant. Responsible for mechanical engineering training and consultancy
		F.3	Senior consultant. Carries out consultancy in area of chemical engineering. Also responsible for managing company's in-house projects.
		F.4	Consultant responsible for electrical engineering training and consultancy.
		F.5	Managing Director of company.
G	Manufactures office seating.	G.1	Information Technology Manager. Responsible for all information technology within organisation
H	Manufactures electronic components for the automotive industry.	H.1	Product Team Leader of group responsible for design, development and manufacture of instrument panels for automobiles.
		H.2	Programme Manager in same group as H.1.
		H.3	Employed as Senior Project Engineer in group responsible for development and manufacture of control modules for automobile engines.
		H.4	Senior Manufacturing Engineer in same group as H.3.
I	County Council.	I.1	Corporate Resources Manager in Legal and Administrative Directorate, providing corporate support, including provision of datacommunications and telecommunications to all council departments.
J	Manufactures both data and telecommunication products.	J.1	Manager of Overhead Equipment and Services within Business Services Department. Carries out procurement for Estates, Personnel, Engineering, Transport and Marketing.
		J.2	Head of Business Engineering. Responsible for developing organisation-wide processes and procedures to ensure products meet time-to-market targets.
		J.3	Employed as New Product Introduction Manager in department developing payphone products.
		J.4	Project Manager in same department as J.3.
		J.5	Software Projects Manager in Public Networks product group.
K	A firm of solicitors.	K.1	Insurance claim investigator.
L	A University.	L.1	Director of School
		L.2	Head of Computing and Information Services of corporate group responsible for providing all information technology services.
		L.3	Assistant Manager of corporate function responsible for overseeing University's core activities.
		L.4	Manager of Estate Management Services. Responsible for all capital projects across the organisation.
		L.5	Member of management team within School.

Table 4.2.2 (Cont.)

Org.	Profile of Organisation	Subject	Profile of Subject
M	Metropolitan Borough Council.	M.1	Senior Economic Regeneration Officer in Economic Regeneration Unit.
		M.2	Assistant Chief Executive Officer, with specific responsibility for construction of new leisure centre.
		M.3	Employed as the Quality Manager in the Department of Planning and Development.
		M.4	Group Manager of the department responsible for environmental services.
		M.5	Director of Leisure Services.
		M.6	Head of Libraries.
N	Manufacturers soaps, detergents and other related products.	N.1	Carries out the role of Category Machinery Manager, responsible for the production of fabric conditioners and washing liquids.
O	City Council.	O.1	Manager of community library services.
P	Supplies electricity and other utilities.	P.1	Production controller in the department responsible for the maintenance and development of power systems.
Q	Manufacturers food additives.	Q.1	Energy Manager. Responsible for energy management and efficiency initiatives.
R	Supplies information technology services	R.1	Manager of Project Management Focus Group, responsible managing projects and for developing best practice across the organisation.
		R.2	Working as Project Manager in department responsible for developing organisation infrastructure (including buildings and information technology).
		R.3	Project Manager in Project Management Focus Group.
		R.4	Project Office Manager in Project Management Focus Group.
S	Regional Passport Agency.	S.1	Manager of regional agency.
		S.2	Employed as Manager of team responsible for processing passport applications.
		S.3	Manager of department responsible for partnerships with outside agencies.
T	Manufacturers sports and leisure wear	T.1	Carries out the role of Category Manager, responsible for the production of licensed sportswear.
		T.2	Advanced Concepts and Engineering Manager in Footwear and Equipment International Division.
U	Manufacturers automotives.	U.1	Employed as Senior Electrical Engineer in Works Engineering. Responsible for providing new engineering and production facilities, including buildings and utilities.
		U.2	Chief Process Engineer in Process Planning department.
V	Insurance brokers	V.1	Insurance broker.

4.3 Organisation Characteristics

In order to investigate the factors influencing project management practice it is necessary to have a diversity of organisations in terms of size, status and “product” supplied. Seventeen organisations (51 subjects interviewed) are large in size, 3 organisations (6 subjects interviewed) are medium-sized and 2 organisations (6 subjects interviewed) are small in size; where “large” is 500 people or above, “medium” is 50 - 499 people and “small” is less than 50 people. The bias towards large-sized (77% of companies selected and 81% of subjects interviewed) is necessary to explore the different organisational factors influencing project management practice. However, the inclusion of small and medium-sized organisations allows the consideration of organisation size as a variable influencing the use of project management.

Sixteen of the 22 of organisations selected, with 34 of the subjects interviewed, are in the private sector. Of the remaining organisations, the inclusion of 6 from the public sector, such as local authorities and educational establishments (with 20 subjects accounting for 32% of all subjects interviewed), allows comparisons to be made of project management practice between sectors. (Although care needs taking in making comparisons as, for example, organisation D, whilst being state-owned, is not typical of a public sector organisation).

The selected organisations are well balanced in terms of “product” supplied between those providing a service, 12 organisations, and those manufacturing products, 10 organisations. Within the organisations, a slightly larger proportion of subjects interviewed work for service organisations (39: 62%) in comparison to those employed by manufacturers (24: 38%).

In terms of the three variables of organisation size, status and “product” supplied, the sample has a mixture of organisations with different combinations of the three variables (see Table 4.3.1). The most common combination is represented by the 6 (27% of) organisations that are large, private manufacturers, with 22 (35% of) subjects interviewed work for these 6 organisations. The sample has diversity in terms of the business sectors represented by these 6 organisations. The manufacturing presence is balanced by 5 organisations, with 10 subjects, who are large, private service-providers and by 5 large,

public service organisations, with 16 subjects. In terms of business sectors, there is also diversity in the selected large, private service providers. The remaining 6 organisations are made up of: 1 large-sized public manufacturer, 2 medium-sized private manufacturers, 1 medium-sized service provider, 1 small-sized, private service provider and 1 small sized, public service provider.

Five organisations are corporate members of the Association of Project Management (APM). Twenty three (37% of) subjects work in these 5 organisations. Corporate membership is one possible indication, although not the only one, of an organisation that is “in the project business”, compared with those organisations who occasionally get involved with projects.

To this list of 5 project-focused organisations might be added 3 other organisations that, by the nature of their business, could be classed as project-focused organisations. A breakdown of the organisations in each of the two categories is given in Table 4.3.2.. There is a balance of subjects interviewed from the 8 organisations in traditional project focused business sectors (29 (46% of) subjects) compared with those from organisations with less of a project tradition (14 organisations: 34 (54% of) subjects). In general terms there is also a link between the existence of a tradition of project work and the type of projects undertaken, with most project-focused organisations being from business sectors where traditional “hard” projects, in such areas as defence, aerospace and “heavy” manufacturing, are undertaken.

4.4 Subject Information

The majority of subjects (54: 86%) had been working for their organisation for 5 years or more. Four subjects (6%) had been employed in their organisation for either 3 or 4 years and five subjects (8%) had been in their organisation for less than 3 years.

4.4.1 Function

A breakdown of the functions in which subjects worked is given in Table 4.4.1. The two most common functions in which subjects worked are: project management, accounting for 21 (33% of) subjects, and service operations, with 20 (32% of) subjects.

Table 4.3.1: Organisation Profiles

Organisation	Business	Size	Service/ Manuf.	Private/ Public	No of staff Interviewed
B	Chemicals/Energy	Large	Manuf.	Private	4
C	Defence/Aerospace	Large	Manuf.	Private	4
H	Sundry Manufacturing	Large	Manuf.	Private	4
J	Information Systems	Large	Manuf.	Private	5
T	Sundry Manufacturing	Large	Manuf.	Private	2
U	Automotive	Large	Manuf.	Private	2
V	Private Admin/Services	Large	Service	Private	1
A	Banking/Financial services	Large	Service	Private	6
E	Information Systems	Large	Service	Private	1
N	Sundry Manufacturing	Large	Service	Private	1
P	Chemicals/Energy	Large	Service	Private	1
I	Public Admin/Services	Large	Service	Public	1
L	Education/Training/Consultancy	Large	Service	Public	5
M	Public Admin/Services	Large	Service	Public	6
O	Public Admin/Services	Large	Service	Public	1
S	Public Admin/Services	Large	Service	Public	3
D	Chemicals/Energy	Large	Manuf.	Public	4
G	Sundry Manufacturing	Medium	Manuf.	Private	1
Q	Sundry Manufacturing	Medium	Manuf.	Private	1
R	Information Systems	Medium	Service	Private	4
K	Private Admin/Services	Small	Service	Private	1
F	Education/Training/Consultancy	Small	Service	Public	5
TOTAL RESPONDENTS					63

Table 4.3.2: Organisation Characteristics: Project v. Non-project Focused

Organisation	Business Sector	Nature of Business	No of subjects Interviewed
Traditionally project-focused			
A*	Banking/Financial services	Supplier of financial products	6
C*	Defence/Aerospace	Supplier of defence products and services	4
D*	Chemicals/Energy	Reprocessor of fuel products	4
E	Information Systems	Supplier of telecommunication services	1
H	Sundry Manufacturing	Manufacturer of electronic components	4
J*	Information Systems	Manufacturer of telecommunications products	5
N	Sundry Manufacturing	Manufacturer of soap/detergent products	1
P	Chemicals/Energy	Supplier of electricity	1
R*	Information Systems	Supplier of IT services	4
		Sub-total	30
Not traditionally project-focused			
B	Chemicals/Energy	Refiner of chemical products	4
F	Education/Training/Consultancy	Provider of consultancy & training	5
G	Sundry Manufacturing	Manufacturer of office furniture	1
I	Public Admin/Services	Local government departments	1
K	Private Admin/Services	Insurance claim investigator	1
L	Education/Training/Consultancy	University departments	5
M	Public Admin/Services	Local government departments	6
O	Public Admin/Services	Local government departments	1
Q	Sundry Manufacturing	Manufacturer of pharmaceutical products	1
S	Public Admin/Services	Central government agency	3
T	Sundry Manufacturing	Manufacturer of sportswear	2
U	Automotive	Manufacturer of motor vehicles	2
V	Private Admin/Services	Local government departments	1
		Sub-total	33
		TOTAL	63

Another 15 subjects (24%) worked in IT support, production, marketing, engineering and logistics. The remaining 7 subjects (11%) in the “Other” category worked in the following specialist functions: prime contracting (1 subject), business efficiency improvement (1 subject), internal consultancy (2 subjects), estates management (1 subject), legal/contracts (1 subject) and customer relations (1 subject).

Table 4.4.1: Function of Subject

<i>Function</i>	<i>f</i>	<i>%</i>
Project Management	21	33.3
Service Operations	20	31.8
Other	7	11.1
IT	6	9.5
Production	6	9.5
Marketing	1	1.6
Engineering	1	1.6
Logistics	1	1.6
TOTAL =	63	100.0

4.4.2 Project Roles

Twenty seven (43%) of the subjects classified their main project role as practising project manager (see Table 4.4.2).

Table 4.4.2: Main Project Role of Subject

<i>Role</i>	<i>f</i>	<i>%</i>
Project Manager	27	42.8
Member of Steering Committee/Strategy Group	8	12.7
Programme Director/Manager	5	8.0
Development of project management processes/procedures	5	8.0
Manager of project organisation (full-time project managers)	5	8.0
Project team member	4	6.3
End user	3	4.7
Functional Manager supplying people to work on projects	3	4.7
Project Sponsor	2	3.2
Functional support to projects	1	1.6
TOTAL =	63	100.0

The remaining 36 (58% of) subjects carried out a variety of roles as their main involvement in projects. Twenty nine of these 36 were primarily involved in projects at a strategic or

senior management level, through the roles of member of steering committee/strategy group, programme director/manager, developer of project management processes/procedures, manager of a project organisation and formal sponsor of projects.

There is a distinction between a subject's day-to-day involvement in project work and the degree of multi-project involvement. Thirty one (49%) of subjects were involved day-to-day in specific individual projects, through the roles of project manager or project team member. Twenty five (60%) of subjects have an involvement that encompasses either overseeing projects from a senior management perspective or working in an environment that is not necessarily specific to an individual project. This is through the roles of member of strategy/steering committee, programme manager, manager of a project organisation, sponsor of projects and developer of organisation-wide project management processes and procedures.

The subjects carried out a variety of project roles whilst working in different functions. The diversity of the sample in this context is shown by the completed matrix "Main Project Role - Matched to Function" shown in Table 4.4.3. The subjects are broadly split into those whose main role was as a project manager (27 subjects: 43%) and those who worked on projects mainly fulfilling other roles, such as a member of steering a committee and a programme director (36 subjects: 57%). In service organisations, most project managers were located in operational functions (10 subjects: 16%), whilst in project-focused manufacturing organisations most project managers were located in a project management function (10 subjects: 16%). The sample also has a representation of subjects at a senior level in the project management functions, with 3 subjects (5%) being managers of a project management function and a further 3 subjects being programme directors.

As well as carrying out a main project role, 61 subjects had also carried out at least one other project role in the past or the present. This multiplicity of project roles is shown in Table 4.4.4, with those with the most "experience", in terms of breadth of involvement, carrying out up to 11 different project roles either currently or in the past. Based on this frequency distribution, subjects had, on average, an involvement in projects through carrying out between 5 and 6 different roles. These findings are discussed in Chapter 8.

Table 4.4.3: Main Project Role of Subject - Matched to Functional Work Area

<u>Main Project Role</u>	Sales/ Marketing	IT	Service Operations	<u>Functional Work Area</u>				Project Manage.	Education/ Training	Other	TOTAL
				Production	Finance	Engineering/ /Design	Logistics				
Member of steering/ strategy group		1	5	1				1			8
Formal sponsor of individual project			1	1							2
End user of project's product/service			2	1							3
Project Manager	1	1	10	1				10	4		27
Project team member				1			1	2			4
Manager of a project organisation		1						3	1		5
Functional manager supplying people		2		1							3
Functional support (purchasing, finance)			1								1
Programme director			1		1			3			5
Other support to projects		1	1					2	1		5
TOTALS	1	6	21	6	1	0	1	21	0	6	63

Table 4.4.4: Number of Project Roles – Past and Present

<i>Number of Roles</i>	<i>f</i>	<i>%</i>
One	2	3.2
Two	4	6.4
Three	5	7.9
Four	6	9.5
Five	2	3.2
Six	7	11.1
Seven	9	14.3
Eight	9	14.3
Nine	12	19.0
Ten	5	7.9
Eleven	2	3.2
No answer	2	3.2
TOTAL =	63	100.0

In terms of this current and past involvement in projects, there is a distinction between those who have worked on developing project management systems and those with no such experience. Over half of the subjects interviewed (36:57%) had experience of developing project management processes and procedures, compared with 27 (43%) with no such experience.

4.4.3 Type of Project Work

The survey sample also contains a diversity of subjects in terms of the type of project work carried out (as shown in Table 4.4.5).

Table 4.4.5: Main Project Work Area of Subject

<i>Role</i>	<i>f</i>	<i>%</i>
Strategic/mission planning	15	23.8
New product development	15	23.8
New System development	7	11.1
Construction	5	8.0
Operational planning	3	4.7
Manufacturing/engineering	3	4.7
Education/training	3	4.7
Administrative/procedural	2	3.2
Plant maintenance/commissioning	2	3.2
Business process re-engineering	2	3.2
Relocation	1	1.6
Restructuring	1	1.6
Research	1	1.6
Other	3	4.8
TOTAL =	63	100.0

As expected, given the high proportion of subjects involved in projects at a senior management level, a large proportion of subjects (15: 24%) identified strategy and mission planning as their main project work area. This proportion is matched (another 15 subjects) by those primarily involved in new product development projects. The remaining 33 subjects (52%) carried out a wide variety of project work; encompassing long to medium-term projects in new system development and research & development (8 subjects: 13%) through to short-term operational planning and administration/procedural project work (5 subjects: 8%).

The subjects also span traditional “hard” project areas, such as construction, plant maintenance/commissioning and manufacturing (10 subjects: 16%) and non-traditional “soft” project areas such as business process re-engineering, education/training, relocation and restructuring (7 subjects: 11%). The remaining 3 subjects (5%) worked in specialised work areas of internal consultancy and claims investigation. In terms of the “hard”/“soft” dichotomy of projects, based on the degree of tangibility of the end “product”, 36 (57% of) subjects predominantly worked in traditional project work areas, such as manufacturing and construction. Twenty seven (43% of) subjects main project work area was in the softer areas, such as strategic/mission planning and restructuring. (Where project work areas include both hard and soft elements, such as new system development, the classification is based on whether it is the soft or hard elements that form the focus of the end product).

Table 4.4.6 shows the different functions in which subjects work whilst carrying out their main project area of work. Most of the subjects working on new product development projects in manufacturing organisations (10 subjects: 16%) were located in specialised project management functions. Those subjects working on new product development in service organisations, for example in developing new financial products in the banking/financial services sector (3 subjects: 5%), worked in operational functions. Those subjects working on strategic and mission planning projects were fairly well balanced between those working in service operations (6 subjects: 10%) and those in functions in manufacturing organisations (5 subjects: 8%). Table 4.4.6 further shows that all the subjects primarily involved in new system development projects worked in a specialist IT function.

Table 4.4.6: Main Project Work Area of Subject - Matched to Functional Work Area

<u>Main Area of Project Work</u>	Sales/Mark.	IT	Service Operations	<u>Functional Work Area</u>					Project Manage.	Training	Other	TOTAL
				Production	Finance	Engineering/Design	Logistics	Personnel				
Strategic/mission planning		1	6	1		1			3	3	15	
Research & development			1								1	
Admin. & procedural			1						1		2	
Manuf/engineering				2					1		3	
New product dev/intro	1		3	1					10		15	
Construction			1			1			3		5	
Plant maint/commissioning				2							2	
New system dev/intro.		5	1							1	7	
Operational planning			3								3	
Re-location									1		1	
Re-structuring			1								1	
Education & training			3								3	
BPR									1	1	2	
Other			1						1	1	3	
TOTAL	1	6	21	6	0	1	1	0	20	7	63	

4.4.4 Project Management Experience

The diversity of subjects in terms of the length of time worked in the organisation and in the project environment, their main project role, the number of roles carried out and their main project work area indicates diverse levels of “experience” in relation to the management of projects. Subjects can be classified based on four levels of experience (see Table 4.4.7). The largest proportion of subjects sampled (33: 52%) had direct formal experience of managing either a programme or a project and are classed as level 2. The remainder of the subjects are fairly evenly balanced between those with more experience (level 3), through the development of company-wide project management systems (16 subjects: 26%), and those at the lowest level (1), with no direct experience of managing projects or developing project management systems (14 subjects: 22%). No subjects were in the Level one class, which reflects the fact that the purpose of the survey was to sample subjects with some, albeit indirect, involvement in projects.

Table 4.4.7: Project Management Experience

<i>Level of Experience</i>	<i>f</i>	<i>%</i>
LEVEL ONE: No direct or indirect involvement in projects	0	0
LEVEL TWO: No direct, formal experience of managing a project, but some involvement in project work i.e. as a user or functional manager supplying resources to projects	14	22.2
LEVEL THREE: Direct, formal experience of managing a project i.e. as a programme/project manager	33	52.4
LEVEL 4: Direct, formal experience of managing a project, with experience of developing company-wide project management systems	16	25.4
TOTAL =	63	100.0

4.4.5 Project Environment

Table 4.4.8 shows situations in which subjects manage projects. This highlights the existence of a variety of customer-supplier situations in any one organisation, with subjects often citing that more than one situation applies. The most striking feature illustrated is the high proportion, cited by 78% of subjects, of situations in which projects are managed “By our own organisation (on behalf of our section/dept. in our organisation)”. This suggests a high level of “internal” project work, initiated by, and for the benefit of, a subject’s own organisation. The second most common situation, cited by 49% of subjects, is situations where projects are being managed “By our own organisation (on behalf of another

section/dept. in our organisation”).

Table 4.4.8: Project Environment (Total = 62)

<i>Situation in which organisation manages projects</i>	<i>f</i>	<i>%</i>
By our own organisation (on behalf of our section/dept.)	49	79
By our own organisation (on behalf of another section/dept)	31	50
By our own organisation on behalf of external companies	20	32
On our behalf by another section/dept.	12	19
On our behalf by an external company	12	19

A common feature of these two most frequently cited situations is that the primary focus is on “internal” customer/supplier relationships. In situations where project management was carried out “On our behalf, by another section/dept. in our organisation”, 20% of subjects identified situations where they acted as “internal” customer. By contrast, less than 40% of subjects had customers “external” to the organisation, managing projects “on behalf of external companies” and only 20% of subjects had their projects managed “On our behalf by an external company”.

Six of the subjects working in situations where they were managing projects “on behalf of external companies” worked in the public sector. Analysis of the types of project work carried out by these subjects testifies to the existence of external collaboration projects, often between public and private organisations. For example, subject L.5 - a university employee - was managing a project on behalf of a private company (to run an academic programme) worth £100m. In addition, L.5 was managing a project on behalf of the Northern Consortium of Universities, totalling £10m, to assist in the development of regional engineering colleges in India.

4.5 Changes Witnessed by Subjects During Time in Organisation

Table 4.5.1 shows the number of subjects witnessing 1 or more of 13 different change programmes during their time in the organisation. The results show the large amount, and the varied nature, of change carried out, with at least 58% of subjects having witnessed all the changes, with the exception of change of company ownership. (Frequency distribution diagrams are provided in Appendix 4.1). The changes described under the “other” category can be categorised as being related to specific strategic initiatives, such

as cost-cutting, targeting resources and establishing a competitive, commercial status between departments in an organisation. Table 4.5.1 also shows the degree to which the changes are perceived as having had a positive effect. The results show that, in the opinion of the subjects interviewed, no single change initiative has had a strongly negative effect on the organisation.

Table 4.5.1 Level of Agreement of Positive Effect of Change Programmes Witnessed (Total = 62)**

<i>Change Programme</i>	<i>f</i>	<i>S.A.</i>	<i>A.</i>	<i>N.</i>	<i>D.</i>	<i>S.D.</i>	<i>D.K.</i>	<i>*Mean</i>
Re-defining of jobs	51	3	28	15	5	0	0	2.06
Project approach to work	39	5	25	5	2	0	2	2.11
Organisation-wide training in project management	37	7	16	9	4	0	1	2.28
Quality management system accreditation	49	9	24	10	4	2	0	2.31
Reduction in management layers	48	6	28	15	5	0	0	2.40
Total quality management	41	9	15	5	4	5	3	2.50
Policy of recognition for project-related work	46	2	23	14	5	0	2	2.50
Quality circles	49	1	33	8	5	2	0	2.50
Policy of employee involvement in decision-making	46	6	22	8	8	2	2	2.52
Policy of recognition for developing skills in project-related work	36	4	14	12	4	1	1	2.54
Employee empowerment policy	42	5	17	9	10	1	2	2.64
Change in company ownership	21	1	7	8	2	1	2	2.74
Business process re-engineering	40	5	19	6	7	0	3	2.89
Other	22	9	7	0	2	4	0	2.32

(* excluding Don't Know's

* one subject did not answer)

Measuring Instrument (and Key)

<i>Strongly Agree (S.A.)</i>	<i>Agree (A.)</i>	<i>Neutral (N.)</i>	<i>Disagree (D.)</i>	<i>Strongly Disagree (S.D)</i>	<i>Don't Know (D.K.)</i>
1	2	3	4	5	

4.6 Concluding Remarks

The analysis presented in this chapter show a diversity of subjects surveyed in terms of the business environment, organisation characteristics and work environments. There is representation in the sample from all the business sectors identified in The Association of Project Management's (APM) classification.

In terms of organisation characteristics, the results show a bias towards large-sized organisations. However, this bias is necessary to explore the different organisational factors, such as a subject's function, influencing the use of project management. The

results show an even balance in terms of those organisations and subjects in the service sector and those in the manufacturing sector. Although only 6 of the 22 organisations surveyed are in the public sector, nearly 33% of subjects surveyed worked in these organisations. Similar proportions of organisations and subjects were recorded in relation to membership of The APM. These results, in part, reflect the greater populations of organisations that are in the private sector or are non-corporate APM members. Also, in terms of using project management principles at work, the imbalance reflects the fact that there was an anticipated wider tradition, and hence more pertinent research sources, in the private sector compared to the public sector. However the survey results do show an even balance of subjects in organisations with a high degree of traditional project-focus and those in organisations with no such tradition.

Analysis of work environments shows most subjects had been employed for more than 5 years in the organisation. Although introducing some bias to the survey, this high level of experience ensures accurate and representative information is obtained from subjects regarding their organisations. During their time in their organisations subjects have witnessed a large amount of change, with no one type of change viewed in a strongly negative light.

The results of the survey indicate that subjects have been sampled across all possible functional work areas. Likewise, the results in this chapter show the subjects surveyed carry out a variety of different project roles.

The reporting of project roles highlights the fact that the majority of subjects carry out a number of different roles (the average being between 5 and 6). This leads to a distinction between main project role and project involvement. (The most common profile is those subjects with one main project role and an additional involvement through a variety of different roles).

The results reveal a balance of subjects between those whose main project role gives them a direct day-to-day involvement in projects, through the roles of project manager and project team member, and those who fulfil other roles. There is also a balance between those subjects whose involvement in projects gives them an overseeing/strategic perspective, for

example by membership of a steering committee, and those with no such involvement. Similarly, there is a balance of subjects between those involved in the development of project management processes and those not involved in such a development.

The results of the survey show diversity in the type of project work carried out by subjects. This diversity spans traditional “hard” project areas, such as construction, and “soft” areas, such as restructuring an organisation. The sample has a balance of subjects in each of these areas. The largest main project work area represented is strategic/mission planning. This reflects the fact that a significant number of the subjects in the survey are involved in projects at a senior management level.

The sample was selected to ensure a subject had either a direct or indirect involvement in projects. This is reflected in the levels of project management experience reported.

All subjects have some sort of experience, even if it is only through an indirect role in projects, i.e. a functional manager supplying people to projects. The largest proportion of subjects has direct formal experience of managing a project. In addition a number of subjects have direct formal experience of both managing a project and of developing project management processes.

The survey results indicate a variety of customer-supplier relationships in relation to the environment in which projects are undertaken. The most common situation reported is projects being undertaken on behalf of internal customers, either for a subject’s section or department or for another department or section within a subject’s organisation. However, the sample also contains subjects managing projects on behalf of external customers.

In the next chapter the survey results are presented in relation to the use of projects and project management.

CHAPTER 5

RESULTS: USE OF PROJECT MANAGEMENT

5.1 Introduction

Chapter 3 discussed the design of the research methodology and Chapter 4 was devoted to a presentation of the characteristics of the organisations and subjects sampled. The breadth and depth of the survey means the presentation of the remaining survey results has to be divided into a number of sections. This chapter presents the results of the survey in areas relating to the use of project management.

5.2 Development of Project Management

Table 5.2.1 shows the changes in areas of project management witnessed by subjects since they have been in their organisations. The greatest increase is in the use of project teams to manage work, with 43 (69%) of 62 subjects having seen an increase in the use of project team structures. This compares with 28 (45%) and 25 (40% of) subjects who had witnessed an increase in the role of projects as a strategic tool and the use of project management methods, such as Critical Path Networks, respectively.

Table 5.2.1: Changes in the Use of Project Management Principles (*Total = 62)

<i>Project Management Principle</i>	<i>An Increase</i>	<i>A Decrease</i>	<i>No Change</i>
The role of projects as a strategic tool	28	1	33
The use of project team structures	43	1	18
The use of project management methods	25	2	35

(*one subject did not answer)

Table 5.2.2 shows subjects' responses to question 8 in the questionnaire (see Appendix 3.1). (Frequency distributions can be found in Appendix 5.1). This question asked subjects to rate the importance of a number of factors influencing the changes in terms of the use of projects as a strategic tool, the use of project team structures or the use of project management methods. In terms of mean scores, the factor regarded as most important is "more demanding customer" (mean score of 1.86). This is closely followed by "new business strategy" and "increased competition", with mean scores of 1.88 and 1.96 respectively.

Table 5.2.2: Factors Influencing Changes in the Use of Project Management (Total = 53)**

<i>Factor</i>	<i>f</i>	<i>V. I.</i>	<i>I</i>	<i>N.</i>	<i>U.</i>	<i>V. U.</i>	<i>D. K.</i>	<i>Mean</i>
More demanding customer	53	24	16	10	2	1	0	1.86
New business strategy	52	14	30	6	1	0	1	1.88
Increased competition	51	22	15	8	6	0	0	1.96
Introduction of new technology	51	17	20	9	3	2	0	2.08
Introduction of new management	47	10	22	10	2	3	0	2.28
Greenfield venture/re-start	23	4	6	5	7	2	0	2.88

(* excludes Don't Know's

** ten subjects did not answer)

Measuring Instrument (and Key)

<i>Very Important (V.I.)</i>	<i>Important (I.)</i>	<i>Neutral (N.)</i>	<i>Unimportant (U.)</i>	<i>Very Unimportant (V.U.)</i>	<i>Don't Know (D.K.)</i>
1	2	3	4	5	

The survey results show that “internal” factors also influence the development of project management. Thirty seven (71.2%) and 32 (61.6%) subjects rating “introduction of new technology” and “introduction of new management” as either “very important” or “important”.

Table 5.2.3 shows the single most important reason for the increases in the use of project management principles. The reasons stated as most important under the “Other” category relate exclusively to internal factors. Four of the 7 subjects in this category described how changes in the availability of technology were leading to changes in working practices. For example, electronic communication methods were being used to facilitate the use of multi-functional teams across geographically dispersed sites. The other 3 subjects described how an increased awareness of the existence of project management practices was driving changes in the use of project management.

5.3 Importance of Project Management

Sixty one out of 62 subjects surveyed stated that projects were important to their organisation, and of these 61 subjects 5 (8%) agreed that projects “make or break our organisation”. These 5 subjects were all located in organisations with a traditional focus on project work. The survey found indications that, in some organisations, importance of projects can vary between different parts of the organisation (and might possibly reduce over time). For example, a subject in organisation M, a local authority, perceived a high level of

project-focus in their department at that moment in time, based on their involvement in the management of a project to build a new multi-million pound leisure facility.

Table 5.2.3: Most Important Factor Influencing Changes in Use of Project Management

<i>Factor</i>	<i>f</i>	<i>%</i>	<i>Valid %</i>
More demanding customer	18	28.6	34.0
New business strategy	9	14.3	17.0
Increased competition	8	12.7	15.0
Introduction of new management	7	11.1	13.2
Other	7	11.1	13.2
Greenfield venture/re-start	2	3.2	3.8
Introduction of new technology	2	3.2	3.8
No answer	10	15.8	Missing
	TOTAL	63	100.0
Valid Cases 53 Missing Cases 10			

5.4 Scope of Project Management

In terms of the scope of project work, forty (63% of) subjects agreed that a project is a vehicle for tackling all business-led change, compared to 23 (37%) who felt it was only applicable to manage major, one-off, capital-intensive work activities.

Table 5.4.1 reports the results of the statistical tests in respect of the hypotheses relating to the relationship between the perceived applicability of project management and both the characteristics of an organisation and a subject's involvement in project work. The results suggest that the characteristics of an organisation have no significant influence on whether a subject perceives a project to be an appropriate vehicle for tackling all business-led change or applicable only to manage major, one-off, capital-intensive tasks.

The results show a significant association between a subject's main involvement in projects and the perceived application of project management. Subjects whose main project involvement is working on soft projects are more likely to subscribe to the definition of a project as a vehicle for tackling all business-led change than are subjects whose main involvement is on hard projects.

Table 5.4.1: Chi Square Test Results – Definitions of a Project by Organisation/Work Factor

<i>Factor</i>	<i>Definition of a project (expected frequency)</i>		<i>Chi Square Value (Pearson) (df, N)</i>
	<i>Major, one-off, capital intensive tasks</i>	<i>All business- led change</i>	
Degree of project focus			
- High	9 (11.0)	21 (19.0)	
- Low	14 (12.0)	19 (21.0)	1.05 (1, 63)
Type of product supplied			
- Manufactured	9 (8.8)	15 (15.2)	
- Service	14 (14.2)	25 (24.8)	0.02 (1, 63)
Status of organisation			
- Private	17 (17.2)	30 (29.8)	
- Public	6 (5.8)	10 (10.2)	0.01 (1, 63)
APM corporate member			
- Yes	6 (8.4)	17 (14.6)	
- No	17 (14.6)	23 (25.4)	1.70 (1, 63)
Main involvement			
- Hard projects	16 (9.9)	11 (17.1)	
- Soft projects	7 (13.1)	29 (22.9)	*10.55 (1, 63)

*Critical chi-square value is 3.84 at the 5% level, so reject H_0 : There is no association between definitions of a project and organisation/work factor and accept H_1 : There is an association between definitions of a project and organisation/work factor

5.5 Features of a Project Environment

Details of the existence of features of the project environment are shown in Table 5.5.1. (Appendix 5.2 contains figures of the frequency distributions.) The results suggest two groupings for the 8 individual characteristics of the project environment.

The first grouping is characterised by distributions with a clear skew to the left - indicating agreement that the characteristic is present in the organisation. The modal attitude in each of these cases is “agree”. The characteristics falling into this grouping are:

- Project ideas/information is freely shared by all,
- Project-focused meetings are held in the organisation,
- Open two-way partnerships with customers exist,
- Open two-way partnerships with suppliers exist.

The second grouping is characterised by a bi-modal distribution, with the highest scoring attitudes of “agree” and “disagree” having similar frequencies. In this group are:

... K and M are large-sized and multi-organisations were involved in dealing with or supplier. Furthermore, a number of subjects were involved in dealing with other parts of the organisation and management principles.

Useful Uses of Project Management

... subjects ratings of the current usefulness of project management in the questionnaire (Appendix 3.1). ... is actually being utilised in organisation in an ideal situation. (Frequency distribution)

Useful Uses of Project Management

	<i>V.U.</i>	<i>U.</i>
Project objectives	30	22
Project management	29	26
Project processes	32	14
Project objectives	27	19
Project objectives	31	13
Project objectives	22	21
Project processes	14	31
Business-related issues	14	22
Project specifications	9	29
Project management	7	32
Project management	9	24
Project ideas	6	22
Project management	5	21
Continuous improvement	4	21
Continuous improvement	3	24
Project management	3	17

... two subjects did not answer

Measuring Instrument (and Ke...

<i>Useful (I.)</i>	<i>Neutral (N.)</i>
2	3

... frequency distributions suggest the 10 ... the uses whose frequency distributions s...

Social gatherings and festivities associated with projects are held in the organisation
 A common project "language" is shared by all
 Project teams are usually brought together to work in close physical proximity to each other
 Project information is clearly evident in the work environment

The characteristics in the first group have means tending towards agreement. The characteristic is present in the organisation. The characteristic means tending more towards neutrality or disagreement regarding its presence.

Table 5.5.1 Features of Project Environment

<i>Feature</i>	<i>S.A.</i>	<i>A.</i>	<i>N.</i>
Project focused meetings are held in the organisation	20	34	2
Open two-way partnerships with customers exist	12	29	9
Project ideas/information is freely shared by all	7	30	10
Open two-way partnerships with suppliers exist	9	25	10
A common project "language" is shared by all	5	29	6
Project teams are usually brought together to work in close physical proximity to each other	5	23	4
Project information is clearly evident in the work environment (e.g. charts/pictures)	5	17	8
Social gatherings and festivities associated with projects are held in the organisation	4	18	10

(* excluding Don't Know's ** four subjects did not answer)

Measuring Instrument (and Ke...

<i>Strongly Agree (S.A.)</i>	<i>Agree (A.)</i>	<i>Neutral (N.)</i>	<i>Disagree (D.)</i>	<i>Strongly Disagree (S.D.)</i>
1	2	3	4	

The results suggest the absence of a common project language. ... establishing partnerships with internal customers and suppliers. ... did not believe a common project language existed also believe in establishing partnerships with their customers and suppliers. These 12 subjects were ... subjects, B - 2 subjects, D - 2 subjects, F - 2 subjects, L - 2 subjects.

left (i.e. towards “usefulness”), with low frequencies for “Neutral” and “Not Useful” categories. In this class are the uses:

Co-ordination of work, Co-ordination of resources, Meeting time project objectives, Meeting cost project objectives, Meeting quality objectives, Prioritising Work.

Secondly, the uses whose frequencies show a slight skew towards the left, with high frequencies for “Useful” and “Neutral” categories and low frequencies for “Very Useful”.

This class incorporates the uses of:

Building new knowledge, Eliminating competing ideas, Firefighting/resolving crises, Setting new product/service specifications, Controlling management processes, Identification/resolution of business related issues.

The final class contains uses whose frequency distributions show no skewing towards “usefulness”, with comparable frequencies for “Useful” and “Not Useful” categories. This incorporates the remaining 4 uses:

Facilitating innovation, Facilitating creativity, Measurement of continuous improvement, Management of continuous improvement.

The results of the statistical tests for the hypothesis testing the relationship between uses of project management and the characteristics of an organisation are shown in Table 5.6.2. The results show an association between the degree of project-focus in the organisation and the use of project management to eliminate competing ideas, with subjects in project-focused organisations finding project management significantly more useful in this area than subjects in other organisations. No significant associations were found in relation to the degree of project-focus and the other areas of use.

Table 5.6.3 reports the results of the statistical tests in respect of the hypotheses relating to the relationship between uses of project management and the organisation/work factors of function, main project role, project involvement and effect of TQM programme.

The results show no significant association between a subject’s function, in terms of being project/ programme management-related and the perceived usefulness of project management to either build new knowledge or facilitate creativity.

Table 5.6.2: Chi Square Test Results – Degree of Usefulness by Organisation Factor (n=61)

<i>Factor</i>	<i>Degree of Usefulness (expected frequency)</i>		<i>Chi Square Value (Pearson)</i>
	<i>Very Useful/ Useful</i>	<i>Neutral/ Not Useful</i>	
	a. co-ordination of work		
Project-focused	30 (27.0)	0 (3.0)	Not valid as two e.f. < 5
Not project-focused	25 (28.00)	6 (3.0)	
	b. co-ordination of resources		
Project-focused	21(22.6)	9 (7.4)	0.93
Not project-focused	25 (23.4)	6 (7.6)	
	c. meeting time project objectives		
Project-focused	30 (25.6)	0 (4.4)	Not valid as two e.f. < 5
Not project-focused	22 (26.4)	9 (4.6)	
	d. meeting cost project objectives		
Project-focused	24 (21.6)	6 (8.4)	1.82
Not project-focused	20 (22.4)	11 (8.6)	
	e. meeting quality project objectives		
Project-focused	22 (21.1)	8 (8.9)	0.23
Not project-focused	21 (21.9)	10 (9.1)	
	f. facilitating innovation		
Project-focused	14 (13.0)	16 (17.0)	0.27
Not project-focused	12 (13.0)	18 (17.0)	
	g. facilitating creativity		
Project-focused	10 (10.0)	20 (20.0)	0.00
Not project-focused	10 (10.0)	20 (20.0)	
	h. building new knowledge		
Project-focused	20 (19.2)	10 (10.8)	0.19
Not project-focused	19 (19.80)	12 (11.2)	
	i. eliminating competing ideas		
Project-focused	27 (22.0)	13 (18.0)	* 5.94
Not project-focused	11 (16.0)	18 (13.0)	
	j. prioritising work		
Project-focused	22 (22.6)	8 (7.4)	0.14
Not project-focused	24 (23.4)	7 (7.6)	
	k. firefighting		
Project-focused	20 (16.5)	10 (13.5)	3.30
Not project-focused	13 (16.5)	17 (13.5)	
	l. setting new specifications		
Project-focused	22 (19.9)	8 (12.1)	1.20
Not project-focused	16 (18.1)	13 (10.9)	
	m. controlling management processes		
Project-focused	24 (22.1)	6 (7.9)	1.18
Not project-focused	21 (22.9)	10 (8.1)	
	n. identification of business-related issues		
Project-focused	16 (18.0)	14 (12.0)	1.11
Not project-focused	20 (18.0)	10 (12.0)	
	o. measurement of continuous improvement		
Project-focused	16 (13.3)	13 (15.7)	2.04
Not project-focused	11 (13.7)	19 (16.3)	
	p. management of continuous improvement		
Project-focused	17 (13.5)	13 (16.5)	3.30
Not project-focused	10 (13.5)	20 (16.5)	

*Critical chi-square value is 3.84 at the 5% level, so reject H_0 : There is no association between degree of usefulness and organisation factor and accept H_1 : There is an association.

Table 5.6.3: Chi Square Test Results – Degree of Usefulness by Organisation/Work Factor

<i>Factor</i>	<i>Degree of Usefulness (expected frequency)</i>		<i>Chi Square Value (Pearson) (n)</i>
	<i>Very Useful/ Useful</i>	<i>Neutral/ Not Useful</i>	
<i>Function</i>	a. building new knowledge		
Project/programme	14 (14.08)	8 (7.94)	
Management function			
Other functions	25 (24.92)	14 (14.06)	0.00 (61)
	b. facilitating creativity		
Project/programme	8 (7.22)	14 (14.80)	
Management function			
Other functions	12 (12.78)	27 (26.20)	0.20 (61)
<i>Main Project Role</i>	a. building new knowledge		
Project/programme	20 (19.81)	11 (11.18)	
Manager			
Other roles	19 (19.19)	11 (10.82)	0.00 (61)
	b. facilitating creativity		
Project/programme	11 (10.16)	20 (20.83)	
Manager			
Other roles	9 (9.84)	21 (20.17)	0.21 (61)
<i>Project Involvement</i>	a. identification of business-related issues		
Development of project management procedures	24 (23)	12 (13)	
No such involvement	15 (16)	10 (9)	0.28 (61)
	b. controlling management processes		
Development of project management procedures	8 (8.26)	28 (27.73)	
No such involvement	6 (5.74)	19 (19.27)	0.01 (61)
<i>Positive TQM Programme?</i>	a. management of continuous improvement programme		
Strongly Agree/Agree	20 (21.1)	26 (24.9)	
Neutral/Disagree/Strongly Disagree	7 (5.9)	6 (7.10)	0.44 (59)
	b. measurement of continuous improvement programme		
Strongly Agree/Agree	19 (21.2)	28 (25.9)	
Neutral/Disagree/Strongly Disagree	8 (5.9)	5 (7.2)	1.84 (60)

Critical chi-square value is 3.84 at the 5% level, so accept H_0 : There is no association between degree of usefulness and organisation/work factor.

The results suggest that being a project or programme manager does not significantly influence the degree of perceived usefulness of project management in building new knowledge or facilitating creativity.

In terms of using project management to identify business-related issues or control management processes, the results show no association with a subject's involvement in the development of project management procedures.

Finally, there is no evidence that subject's who have witnessed, in their opinion, TQM programmes that had had a positive effect on their organisation, find project management significantly more useful for the management and measurement of continuous improvement than do other subjects.

5.7 Benefits Anticipated from Using Project Management

Table 5.7.1 shows the benefits anticipated by subjects from using project management in the future (see question 50 in the questionnaire, Appendix 3.1). Frequency diagrams are provided in Appendix 5.4. All benefit areas have a mean score of less than 3, suggesting a tendency towards agreement that benefits are anticipated.

Table 5.7.1 Anticipated Benefit from the Use of Project Management (Total = 58)**

<i>Anticipated Benefit</i>	<i>S.A.</i>	<i>A.</i>	<i>N.</i>	<i>D.</i>	<i>S.D.</i>	<i>D.K.</i>	<i>*Mean</i>
Enabling us to better meet customer requirements	33	25	0	0	0	0	1.43
Helping us survive as a business	28	26	2	2	0	0	1.62
Increasing responsibility for work carried out	14	36	6	2	0	0	1.93
Cutting costs whilst maintaining quality	24	31	2	1	0	0	1.66
Aligning desired skills/behaviour to work	11	36	8	3	0	0	2.05
Increasing output with the same resources	12	33	11	1	1	0	2.07
Making employees more motivated	15	30	10	3	0	0	2.02
Reducing time to market	18	24	12	4	0	0	2.03
A way of managing organisational change	14	29	13	2	0	0	2.10
Providing better overview of strategy	14	24	19	1	0	0	2.12
Being more innovative/creative	9	30	13	6	0	0	2.28
Enhancing career opportunities	9	25	20	4	0	0	2.34
Breaking down hostility to organisational change	7	21	25	5	0	0	2.48
Aligning reward/recognition systems to work carried out	7	16	22	11	2	0	2.74

(* excluding Don't Know's

** five subjects did not answer)

Measuring Instrument (and Key)

<i>Strongly Agree (S.A.)</i>	<i>Agree (A.)</i>	<i>Neutral (N.)</i>	<i>Disagree (D.)</i>	<i>Strongly Disagree (S.D.)</i>	<i>Don't Know (D.K.)</i>
1	2	3	4	5	

Table 5.7.2 presents the results of the statistical tests in respect of the hypotheses testing the relationship between anticipated benefits from the use of project management and the characteristics of an organisation.

Table 5.7.2: Mann Whitney U Test Results – Anticipated Benefits from Use of Project Management Grouped by Organisation Characteristic (n = 58)

<i>Anticipated Benefits</i>	<i>Z values for between subjects</i>			
	a.	b.	c.	d.
Enabling us to better meet customer requirements	*-2.37	-1.36	-0.59	-1.89
Helping us survive as a business	-1.46	-0.79	-0.73	-1.08
Increasing responsibility for work carried out	*-2.11	-1.08	-0.78	*-2.49
Cutting costs whilst maintaining quality	-1.13	-0.50	-0.57	0.00
Aligning desired skills/behaviour to work	-1.37	-1.85	-1.48	-1.39
Increasing output with the same resources	-0.20	-0.28	-0.96	-0.15
Making employees more motivated	-0.95	-1.21	-1.51	-1.76
Reducing time to market	*-3.00	-0.73	-1.44	*-2.09
A way of managing organisational change	-0.89	-1.91	-1.43	-0.89
Providing better overview of strategy	-0.04	-0.73	*-2.19	-0.32
Being more innovative/creative	-0.88	-0.52	-1.05	-1.11
Enhancing career opportunities	*-2.04	-0.70	-1.22	*-2.50
Breaking down hostility to organisational change	*-2.01	-1.34	-0.55	*-2.28
Aligning reward/recognition systems to work carried out	-0.96	-0.68	-0.15	-1.88

Key: a. degree of project-focus (high/low)
b. type of “product” supplied (manufactured/service)
c. organisation status (private/public)
d. corporate APM membership (yes/no)

*Z Value equal to or less than -1.96 indicates a significant difference, at the 5% level, between subjects.

The results show organisations with a strong project-focus anticipate significantly higher levels of benefit than other organisations in the following areas:

- Reducing time to market
 - Enabling us to better meet customer requirements
 - Increasing responsibility for work carried out
 - Enhancing career opportunities
 - Breaking down hostility to organisational change
- (mean scores for project-focused organisations are lower than for other organisations in each area).*

No significant difference was found between subjects in project-focused organisations and other subjects in terms of anticipated benefits in other areas.

The tests show no evidence of significant differences in the anticipated benefits between subjects in service organisations and subjects in manufacturing organisations.

The results show public sector organisations anticipate significantly higher levels of benefit than private sector organisations in the following area:

Providing better overview of strategy
(mean scores for public-sector organisations are lower than for private-sector organisations).

No significant difference was found between subjects in public sector organisations and subjects in private sector organisations in terms of anticipated benefits in other areas.

The results show corporate APM member organisations anticipate significantly higher levels of benefit than other organisations in the following areas:

Enhancing career opportunities
Increasing responsibility for work carried out
Reducing time to market
Breaking down hostility to organisational change
(mean scores for APM corporate member organisations are lower than for other organisations in each area).

No significant difference was found between subjects in APM corporate member organisations and subjects in other organisations in terms of anticipated benefits in other areas.

Table 5.7.3 presents the results of the statistical tests in respect of the hypotheses testing the relationship between anticipated benefits from the use of project management and a subject's involvement in projects.

No significant difference was found between subjects whose main project experience is working on "soft" projects and subjects whose main project experience is working on "hard" projects in terms of anticipated benefits.

No significant difference was found between subjects whose main role in projects is as a programme/project manager and subjects with other main project roles in terms of anticipated benefits.

No significant difference was found between subjects involved in the development of project management processes/procedures and subjects with no such involvement in terms of anticipated benefits.

No significant difference was found between subjects with an overseeing/multi-project role and subjects with no such role in terms of anticipated benefits.

Table 5.7.3: Mann Whitney U Test Results – Anticipated Benefits from Use of Project Management Grouped by Subject’s Involvement in Projects (n = 58)

<i>Anticipated Benefits</i>	<i>Z values for between subjects</i>			
	a.	b.	c.	d.
Enabling us to better meet customer requirements	-0.72	-0.86	-1.36	-0.05
Helping us survive as a business	-0.07	-0.47	-0.92	-1.12
Increasing responsibility for work carried out	-0.79	-1.13	-1.32	-1.49
Cutting costs whilst maintaining quality	-0.50	-1.62	-1.03	-2.09
Aligning desired skills/behaviour to work	-1.32	-0.33	-0.04	-1.25
Increasing output with the same resources	-0.64	-0.59	-0.68	-1.07
Making employees more motivated	-0.42	-0.84	-0.28	-0.69
Reducing time to market	-0.57	-1.42	-0.12	-1.01
A way of managing organisational change	-1.04	-0.11	-2.04	-0.50
Providing better overview of strategy	-0.11	-0.32	-1.90	-0.42
Being more innovative/creative	-0.04	-0.19	-1.06	-0.30
Enhancing career opportunities	-0.42	-0.22	-1.57	-0.27
Breaking down hostility to organisational change	-1.32	-0.76	-1.75	-0.16
Aligning reward/recognition systems to work carried out	-0.72	-0.84	-0.22	-0.44

Key:

- a. main project experience (hard/soft projects)
- b. main project role (programme, project manager/other)
- c. project involvement (development of pm processes/not)
- d. main project role (overseeing, multi-project/other)

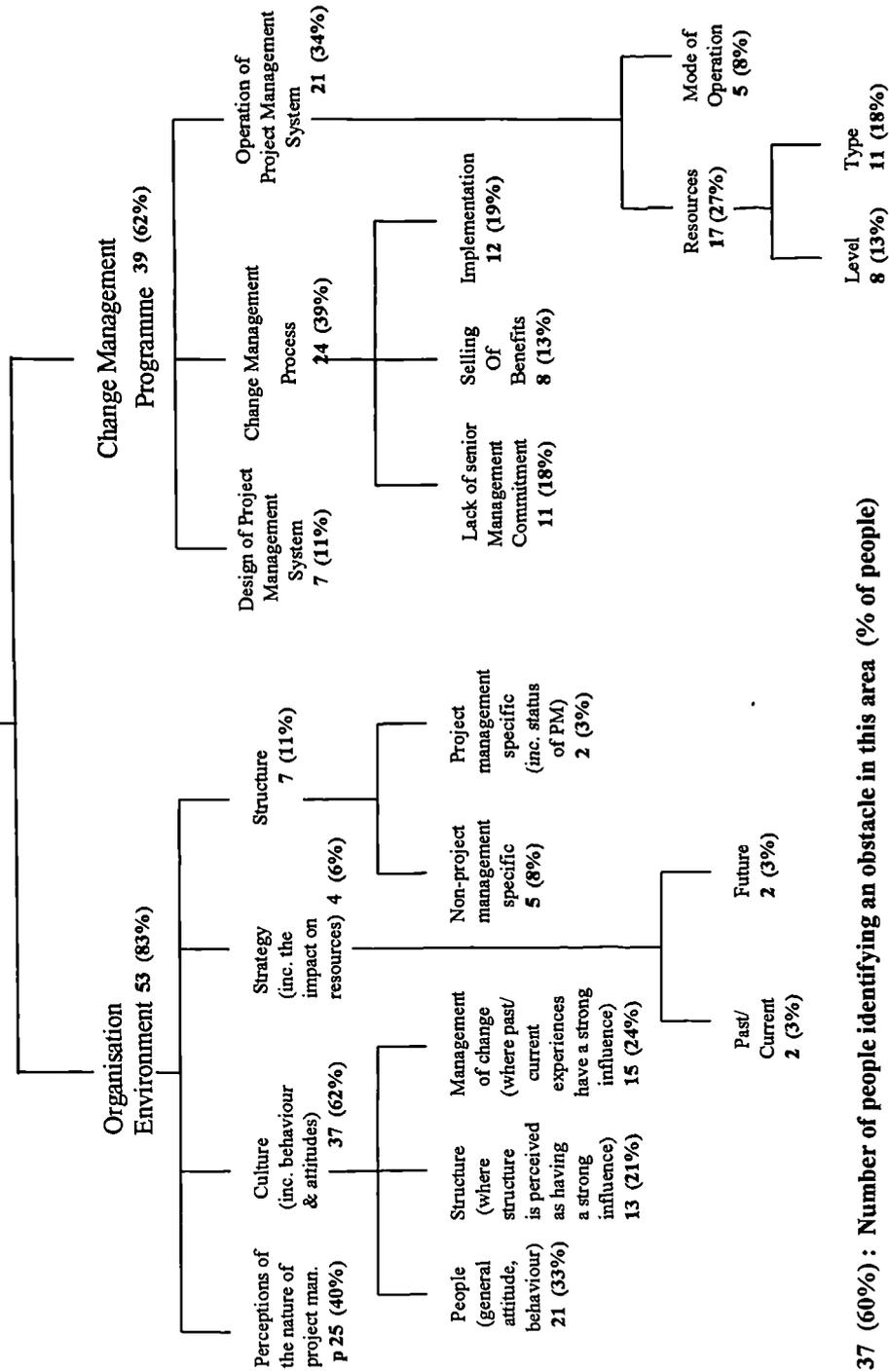
*Z Value equal to or less than -1.96 indicates a significant difference, at the 5% level, between subjects.

5.8 Obstacles to the Use of Project Management

Of the 63 people interviewed, 62 people felt there were possible obstacles to project management being utilised more fully in their organisation. These obstacles can be grouped into two broad areas: those associated with the organisation, and those associated with the change management programme to introduce project management more fully. Figure 5.8.1 presents a hierarchical organisation of the different types of obstacles under the headings of these two broad areas. Subjects often described obstacles in more than one area, hence the totals shown in Figure 5.8.1 exceed 100%.

Figure 5.8.1: Hierarchical Organisation : Obstacles to Use of Project Management

Obstacles to a change programme to use project management teams, methods or tools more fully
63 (100%)



37 (60%) : Number of people identifying an obstacle in this area (% of people)

This hierarchy allows obstacles to be grouped, though it is worth noting that in practice many of the “areas” are inter-linked. For example, one subject who felt the design of the project management system might be an obstacle did so on the basis of past experience of a change programme to introduce a QS 9000 accredited quality management system. The subject felt the QS 9000 system was over-proceduralised and there was a danger that would happen to a project management system. This demonstrates a link between the two areas “design of project management system” and “management of change” (as shown in Figure 5.8.1).

The most commonly cited obstacle to the introduction of project management (39 (62%) of all 63 subjects) was a wider organisational factor, namely, the culture in the organisation. In terms of the specific steps of introducing project management, the most common issue was how the change would be managed. Eleven (18% of) subjects identified the lack of senior management commitment as an obstacle. Eight (13% of) subjects focused on the pre-implementation phase of selling the benefits of the change. Twelve (19% of) subjects identified the management of the introduction of project management, with a specific emphasis put on appointing the right person to manage the activity, and the need to adhere to project management principles and manage the introduction of project management as a project.

5.8.1. Perceptions of the nature of project management

Twenty five (40% of) subjects made comments relating to the perceptions of the nature of project management. The survey results suggest reasons for obstacles in this area can be grouped into the following areas: perceived applicability of project management and perceptions of the characteristics of project management.

5.8.1.1 Perceived applicability of project management

The first issue identified in the survey results in relation to the extent to which anticipated obstacles to the use of project management reflect perceptions of the nature of project management is the applicability of project management principles as a tool for the management of all types of work. Nine of the subjects felt there would be a problem in finding applicable work areas in their organisation. The results show the nature of the work undertaken, in terms of its resource requirements, duration and “complexity” (whether

technical or organisational) as an influence on the perceived applicability of project management. For example, 2 of the 4 consultants interviewed from organisation F, a small training and consultancy firm, believed it would be difficult to apply project management principles to their environment because of the short duration and high degree of repetition in much of their work. A typical comment, from consultant F.4, was: "... there is no conscious opposition, but where will it be applied?" This view was at odds with F.5, the Managing Director of the company, who believed the consultants' work was very much project-focused and that great benefits could be realised, in terms of completing work on time and to agreed budgets, by utilising project management principles. Selling the concept of project work, though, is clearly a problem despite the fact that the Managing Director was running a series of project management seminars for the consultants, aimed at raising project management awareness, at the time of the survey.

The issue of applicability is also evident in larger organisations. I.1, involved in some large IT infrastructure projects as Corporate Resources Manager for a local authority county council made the point: "... some projects last a week and are self-managed. The approach would be laughed at". The view that there are some areas of work in an organisation where project management is, or would be, readily used, and others where it will not be, is echoed by L.4., the manager of the Estates Department in a local university. Responsible for the management of capital projects, such as the building of a new learning resource centre, L.4 believed it would not be seen as appropriate in the "softer" work areas, such as re-structuring and the management of strategy. To quote L.4's words: "... Estate Management's view of the applicability of project management is narrow, which is probably the case across the organisation".

The survey results indicate a resistance to a broadening of the applicability of project management principles into non-traditional project work areas exists amongst staff working in the traditional "hard" project areas. A reason for this resistance can be found in the comments of D.3, the Head of Project Procurement in an organisation reprocessing nuclear fuel. The Project Procurement Group (PPG) was responsible for placing and managing the contracts for all capital projects; ranging from "minor" projects of £2-3 million, to "major" projects, such as a £200m project for a box encapsulation plant. D.3 identified priorities, in

terms of utilising project managers, as a major issue. D.3 highlighted the organisation's main project management weakness as the management of "soft" projects. This weakness resulted from the fact that the organisation was new at managing these softer projects and also appointed inadequate project managers. In the words of D.3: "people are thrown into the arena, with availability being the key factor". Further comments by D.3 hinted at a hierarchy of importance in terms of allocating resources to projects, based on the capital cost of the work undertaken - with the priorities and resources focusing on the capital-intensive "hard" projects. Asked about potential solutions to the problem of managing soft projects, D.3 replied: "I wouldn't waste a good project manager who is managing a £5m construction project on a new Human Resource Management system. It's a question of priorities". In terms of solutions to the problem, D.3 also believed the issue was likely to become exacerbated in the future. Given the cost overhead of project support structures and the projected decline in the amount of capital-intensive project work undertaken, it would be difficult to justify by the existence of a Project Office. Even if this structure did facilitate better management of soft projects.

5.8.1.2 Perceptions of the characteristics of project management

The second major issue in relation to the extent to which anticipated obstacles to the use of project management reflect perceptions of the nature of project management is the understanding of the characteristics of project management. Eighteen of the subjects believed that either project management was not understood or employees in their organisation misunderstood it.

5.8.1.2.1 Lack of understanding of project management

Subjects working in organisations with no history of managing projects felt there was a lack of awareness as to what project management is. A typical company in this category is a regional office responsible for handling the issuing of United Kingdom passports. Described by S.1, the regional manager, as "a clerical-line production process", the organisation was traditionally operation-focused rather than project-focused. Three people in the organisation were interviewed and each one stated that a lack of understanding as to what project management involves would be an obstacle to its use. This lack of awareness is characterised by an attitude that is neither strongly positive nor strongly negative towards the use of project

management. In the words of S.2, a section leader responsible managing staff examining passports and counter staff dealing with the general public:

“Very few people understand project management, it’s not a concept they are familiar with. If people can see definite benefits of project management they would not be resistant”.

Although being traditionally non-project-focused, at the time of the survey the Passport Agency was going through major changes. Central to the changes was a project to out-source the front-end (receiving passport applications and entering them onto computer) and the back-end (issuing the passports) of the passport service on 10 year contracts, with the regional offices retaining the examining part of the passport process. An established project team was centrally managing this project. The team was using a well-defined, formal project management methodology. Although all staff members were aware that the project was taking place, very few, apart from the project team, were aware of the methods being used to manage it. Any understanding of project management principles, shown by the people involved in the management of the out-sourcing project, had not radiated out into the organisation as a whole.

One reason for a lack of awareness may lie in the use of language. S.1 said: “...it is an issue of language - most people don’t recognise projects, because we don’t call things projects”. This suggests organisations, or people, may be undertaking “projects” without being aware of the fact. U.1, a senior electrical engineer working as a project team member in the department responsible for engineering new production facilities for a car manufacturer, thought this was the case across their organisation. Lack of awareness of project management was the key issue described: “Nobody is aware of what project management is about. They might be doing it without knowing they are doing it”.

5.8.1.2.2 Bureaucratic nature of project management

The survey results show that in some organisations, where there is an awareness of project management, this awareness means there would be resistance to project management being used more fully. According to the subjects interviewed, staff in their organisation would see project management as being bureaucratic and hence not beneficial.

The issue of “bureaucracy” was mentioned by 6 of the 25 subjects who identified the understanding of the nature of project management as an obstacle. A crucial distinction is between the perception that project management is, by its nature, bureaucratic and the perception that project management would become a bureaucracy because of the way it would be set up. The 6 subjects who described a potential perception of project management as bureaucratic were:

- A.1 - Communications Services Manager in organisation supplying banking and other financial services
- A.2 - Information Systems Manager
- J.4 - Project Manager in organisation manufacturing telecommunications products
- J.5 - Software Projects Manager
- M.2 - Assistant Chief Executive for a metropolitan borough council
- O.1 - Manager of community library services for a city council.

The perception that project management is, by its nature, bureaucratic is typified by comments of staff working for organisation A. The present company was formed from the merger of a bank and a building society. At the time of the survey the “newly-formed” company was grappling with the problem of bringing together two geographically dispersed organisations. This involved new ways of working, with staff from the “old” bank and the “old” building society having to work together for the first time on cross-organisational projects. This was made difficult by the two organisations’ respective histories. The bank had traditionally employed project management principles, with an emphasis on standardised processes and procedures. The building society had not employed such principles. This has led to a belief, especially with staff of the old building society, that project management is bureaucratic, or in the words of A.1, “...putting in red tape and slowing down the process”. Conversely, some staff in the old bank viewed the old building society’s mode of operation as being “laissez-faire” and “anarchic”.

Linked to this perception of project management as bureaucratic is the distinction between project management and programme management. For example, A.1 described how the perception of project management as rigid and bureaucratic needs to be seen in the context of managing lots of projects together. A.1 identified a fear amongst many senior managers that project management controls would stop them from bringing their particular projects through to authorisation. This was a particular fear as they had recently introduced a programme management structure aimed at linking projects to strategic initiatives, to combine projects

into sequences of work. Part of this new structure was a decision-making framework for prioritising work. This led to 12 projects, from a list of 2000, being prioritised as the “vital few. For many department or group managers, used to informal methods for prioritising work and acquiring resources, the new structure, which is equated with project management, is seen as a restriction on their ability to champion their own projects.

The survey results show no evidence of project management being viewed as bureaucratic based on the existence of over-proceduralised or over-formalised project management processes and procedures. As reported in Chapter 7, the survey found little evidence of problems with the operation of existing processes and procedures.

5.8.2 Culture

The most commonly cited obstacle to the introduction of project management was the culture in the organisation. This issue can be grouped into three areas: the general attitudes and behaviour of people in the organisation, the informal and formal structures that reflect the culture, and the actions of the organisation in the management of change.

5.8.2.1 People

Twenty one (33% of) subjects interviewed believed there would be problems in getting the people in their organisation to accept any further introduction of project management principles. D4, the Head of Engineering and Management Development for the fuel reprocessing company and responsible for project “Pathfinder”, which is designed to determine and implement best project management practice across the organisation, commented:

“...of the practising project managers there are four populations: those that don’t see the need to change and are vociferous against it, those who want change and standardisation as long as it is their way of doing things, those who want change for the better, and those who don’t see the need to change”.

Furthermore, in a total population of 2,400, D.4 estimated only a maximum of 10 people were felt to want change for the better, 300 - 400 wanted change on their terms, and 2,000 were either vociferous against change, or did not see the need for change.

D.4's comments raises the issue of opposition from the established project management community in an organisation. This is borne out in the survey, as two other subjects working as practising project managers echoed D.4's comments.

The first subject, C.3, a senior project engineer working on naval ground systems for an organisation supplying products to the defence and aerospace market, identified the "Not-Invented-Here" syndrome as a problem. C.3 believed there would be inevitable conflict concerning any change introduced, with some groups, who had a long experience of managing projects, believing they were better at project management than other groups. The second subject, R.3, a project manager for a company providing information technology services, identified "empires of interest" within the project groups in the organisation, as an obstacle.

These "empires of interest" can have a very strong effect on the utilisation of project management. This is illustrated by the experiences of B.1, a maintenance engineer working for a refiner of lead-based and associated chemicals. Of the 62 people who had witnessed a change in the profile of project management during their time in the organisation, B.1 was the only person who had seen a decrease in the strategic use of projects and in the use of projects team structures. Having seen project management have a higher profile in the past, B.1 observed:

"... project management is a necessary tool for an organisation like ourselves and if done correctly is highly beneficial. However, parochial and other vested interests can and do water down the effect".

The survey results show that a general lack of recognition of the need for project management is more prevalent in organisations that are not traditionally project-focused. Five subjects believed employees in their organisations would see no reason for change. These 5 subjects work in organisations where awareness of project management was relatively low, namely:

- A small firm of solicitors (K.1),
- A University (L.2 and L.3),
- The Directorate of a Local Authority (M.5),
- The Library Services Department of a (different) Local Authority (O.1).

A typical comment was made by M.5, the Director of a Local Authority Department, when talking about another department in the authority, "... they will say "we do this already and we don't need to change, we are already successful"".

Comments by the subjects working in organisations with little history of managing projects, indicate a perception that employees would find a move towards a more project-based approach to the management of work, in some way, threatening. This was articulated by V.1, an insurance broker, who said: "There would be some resistance to change. The people would be afraid of their positions being affected and the potential reduction in status."

Further comments by V.1 highlight the fact that the resistance to project management is also caused by a belief that the disciplines imposed by adhering to project management principles would restrict individuals in their day-to-day work environment. Discussing their work, V.1 said: "Insurance brokering involves flair and is always changing. Putting in project teams will be inflexible." This perceived conflict is echoed by the comments of L.5, a member of a school management team in a university:

"The academic culture in our organisation emphasises individual freedom. It (introducing project management principles more fully) would be seen as a threat - and a particular problem with established members of staff."

These observations suggest that for employees working in traditional "professions", where highly trained and qualified staff use their individual "professionalism" to deal face-to-face with external "clients", the resistance is more to any change that is seen to shackle an individual's freedom to "get on with job". This is confirmed by the comments of K.1, a highly qualified and specialised claims investigator working for a firm of solicitors; who said that anything that involved, "...form filling - all that nonsense..." would be resisted.

5.8.2.2 Structure

Thirteen (21% of) subjects mentioned issues relating to structure, in the context of the organisation culture. A potential problem cited by 8 subjects is the cultural differences created by a lack of horizontal integration; whether at the macro-level i.e. between "sub-organisations" within a larger organisation, or at the micro-level i.e. between functions within one organisation. The survey suggests an underlying factor leading to a lack of horizontal

integration at the macro-level is, unsurprisingly, a recent history of organisational instability. The 4 subjects who identified obstacles in this area work for two organisations, A and R, that have, in the last 6 years, been formed into completely new business entities through the processes of divestment and merger.

In both instances the forming of one new organisation from two old organisations had left a structural vacuum. In the case of A, the vacuum was filled by a culture which, to use the words of A.5, a business consultant in Group Strategic Planning and Consultancy, was “overtly-political”; with directors of the new organisation using politics and lobbying to ensure projects from their own areas got priority. This was made worse by the fact that the new organisation had not yet created “team” objectives that cut across both “old” businesses and, hence, directors were still being assessed on their success at meeting individual objectives. Attempts to create a new structure, including the introduction of a well-organised programme management structure, with projects co-ordinated horizontally across the whole organisation met with resistance because, according to A.3, it was: “... politically a bombshell because people could not hide behind the chaos.”

In the case of R, the vacuum had left staff uncertain as to what structures existed in the new organisation in terms of organising work. Previously, one part of R had introduced a resource pool structure for allocating and managing people on projects. R.2 believed this initiative had been “... moderately successful.” In the new organisation this structure, along with many other organisational processes, had been dispensed with, but had not been replaced with any new structure. This left staff with problems in terms of acquiring resources from other parts of the new organisation. R.4 defined the new organisational culture as one in which employees are expected to “just go out and do it”. However, in the absence of a clearly established structure, R.4 encountered problems in terms of identifying where people with particular skills resided and what their availability for work might be.

Both R.2 and R.4 felt this lack of structure would be a major obstacle to increasing the use of project management principles. Furthermore, R.2 felt the lack of a structure to facilitate changes cutting across both old organisations would be a problem. Especially as any initiative to introduce project management more fully would need to be co-ordinated across the whole

of the new organisation; and, at present, there was no way of defining accountability or responsibility for the introduction of such a change.

At the micro-level a number of subjects raised the issue of a lack of integration between functions. These subjects were:

- D.2 (Project manager in the Project Procurement Group of a fuel reprocessor)
- H.4 (Senior manufacturing engineer for an automotive manufacturer)
- J.1 (Procurement manager in Business Services function)
- Q.1 (Energy manager for a food additive manufacturer).

The characteristics of an organisation that has little cross-functional involvement is graphically described by J.1 as the “silo effect”; with all staff in one function enclosed in one “silo”, separated by vast open “fields” from staff in other functions (silos). This isolation of individual functions can have a number of adverse effects. There is mistrust of other functions’ motives, based not only on a lack of communication and common understanding across functions, but also on the existence of different functional goals and objectives. For example, D.2, responsible for “minor” projects, identified how different functional goals were causing problems in the very early stages of the project. D.2 cited conflict between the demands of the function responsible for business processes, who saw the project in terms of the establishment of best practice, and the accounting function, who saw the project in terms of cost control. These differing goals and objectives need not, in themselves, be a major obstacle to any change programme cutting across the differing functions. The lack of a structure allowing integration across the functions can lead to a culture of mistrust, or the belief of the existence, in the words of D.2, of “hidden agendas.” It is this culture that may prove a major obstacle, in some cases, to the further adoption of project management principles.

Another issue, also based on a lack of communication and common understanding across functions, is in what area of the organisation responsibility for project work lies.

In the role of site energy and safety officer, Q.1 gained an understanding of the views of different functions. Q.1 believed that some functions would be reticent about becoming involved in any initiative to introduce project management more fully for fear of “treading on the toes of other departments”. This suggests that in some organisations, the responsibility

for managing projects might historically reside in one particular function. Other functions might be loathed to become involved, for the reason just stated, or perhaps, because of potential conflict, if the function responsible for project management saw any move to utilise project management more fully, as a threat to their existence.

In addition to the problem of a lack of horizontal integration a number of subjects identified structures within their organisations that saw too much control at a “centre” as likely obstacles to any change programme to use MPM more fully. These subjects were:

- F.1 (Chemical Engineering Consultant for a training and consultancy organisation)
- L.3 (Assistant manager in corporate services department of a university)
- M.1 (Senior economic regeneration officer)
- T.2 (Advanced Concepts and Engineering Manager in function designing and manufacturing sports footwear and related equipment).

This does not seem to be a problem, as one might expect, unique to large organisations, since F.1 works for the smallest organisation surveyed.

The common thread that links the comments of each of the four subjects is the culture of employee involvement in decision-making allowed within the organisational structure, and how this would have an influence on employees’ willingness to accept any initiatives to introduce project management principles more fully. F.1 cited the lack of involvement in defining projects as a major problem. This lack of involvement led to unrealistic timescales and unrealistic cost objectives. It also created a general feeling of lack of ownership of the project, which caused problems throughout the project life cycle. This problem was echoed, in other comments, by fellow consultants F.2 and F.3. The root cause identified by all three subjects was that decision-making was solely in the hands of the director who founded the organisation. The criteria for decision-making adopted by the director was very much based on generating orders for business for the organisation. Because of this, the organisation committed itself to work purely to generate revenue regardless of the costs involved to the organisation.

This created a culture, according to F.2, characterised by: “... a lack of preparation, a ‘yes-can-do’ approach and an over-optimistic view of our capabilities.” The structure of the organisation did not allow any input from the consultants in terms of analysing client requirements and assessing the organisation’s capability to deliver those requirements.

The effect on culture of a structure with clearly defined and high profile centralised functions distinct from other parts of the organisation is demonstrated in the case of organisation L. This organisation had a “centre” consisting of departments responsible for such activities as finance, personnel, strategy and infrastructure, with “schools” outside the centre responsible for implementing the strategy decided within the centre through the delivery of undergraduate courses, postgraduate courses, professional courses, consultancy and research. L.3, in their role as a manager in the centre, believed that the structure of the organisation led to two distinct cultures: with the “business philosophy and management ethos” of the centre in conflict with the “collegiate culture” in the schools. A fellow senior manager in the centre, L.2, confirmed this phenomena, talking about the “fragmentation of the organisational structure” between the centre and the schools. The effect of this structure was to create a climate where mistrust and a lack of understanding existed between the different parts of the organisation.

This is illustrated by the fact that L.2 and L.3 felt it might be easier to get staff in the centre rather than the schools to accept project management principles more fully. Whilst L.1, a director of one of the schools, commented that “it is easier to get staff to buy in at school level rather than in the centre.” In terms of using project management principles, the existing structure was creating very real problems that L.3 believed would be exacerbated if there were increased efforts to move towards multi-functional teams incorporating people from both the centre and the schools. In particular, there was a recognition that the decision-making process on projects that cut across the organisation, which by that very fact were co-ordinated by the centre, needed to be carried out with full representation from all interested parties. Yet successfully negotiating for resources from other parts of the organisation was often difficult to achieve. This led to a lack of progress in terms of carrying out the activities, or to a lack of ownership, or possibly opposition, from under-represented parts of the organisation.

M.1, in the role of a senior economic regeneration officer for a local authority, stated that the hierarchical structure of the organisation, coupled with the prevalent management style, meant that little authority or responsibility for making decisions was devolved to staff at the lower levels. In a similar fashion to organisation L, the culture of organisation M, according

to M.1, was not based on “trust”; and attempts to utilise multi-disciplinary teams had floundered in the past because the teams created had not been able to make decisions nor act upon them. The comments of T.2, a product manager for a sports manufacturer, suggests that the problem of having decision-making “centred” at a high level is not unique to traditional hierarchical organisations. Organisation T had a flat structure with two layers: the general manager and then the staff below. However, T.2 described how this structure, often equated with the ability to be very flexible and make decisions fast, led to major problems on any projects initiated: “On projects we need financial support. It takes a long time to get decisions. We are asked for justification and then it goes into the ‘slow-track’ system. This causes conflict, especially as we are trying to compress time-lines.” Despite having a flat structure, the culture of the organisation in terms of the decision-making process, was very hierarchical. Without a change of structure to one which devolved authority and responsibility, T.2 believed it would be unable to move towards “an advanced project engineering culture” characteristic of their main competitors.

The problems of structure highlighted above, whether they be related to a lack of horizontal integration in the organisation or the culture of employee involvement in decision-making as influenced by the way the organisation is set up, seem, in some cases, to be magnified by temporal issues. These issues can be grouped into two broad areas: firstly, the geographical dispersion of sites within the organisation and, secondly, the physical layout of facilities within one site. Of the 13 subjects who raised issues relating to structure, in the context of the organisation culture, 5 of these subjects stated that the problems were made worse by the fact that the whole organisation was spread across different locations. These subjects were: H.4, J.1, N.1, R.1 and R.4)

In the case of organisation H, the development of new products was initiated in a group overseas. They would then be passed to the UK site at the start of the implementation stage of the process.

For organisation J, different functional departments were spread over a number of sites in the UK; whilst for organisations N and R, functions were dispersed both across sites in the UK and across different countries in Europe. This complexity in terms of organisation location

made it more difficult to co-ordinate change across the whole organisation, although most of these 5 subjects did not believe this issue was insurmountable in terms of utilising project management principles more fully. In the words of N.1, “the analogy is with a big magnet pulling iron-fillings”; with the “big magnet” being a well-managed change programme.

What is perhaps more difficult to overcome, according to H.4, is the influence of geographical dispersion and, in the case of organisation H, globalisation, on the day-to-day management of projects. Recounting the problems experienced on new product development projects in the organisation H.4 made the point that:

“The global nature of our organisation means it’s often difficult to communicate and it can affect our priorities. It is natural for people to answer those people who are physically closer”.

The issue of physical proximity was also raised by M.1 in the context of the layout within a single site. M.1 believed the existing building, in which each function was very much compartmentalised and isolated from other functions, would hinder any attempts at multi-functional team working. This point was echoed by S.3, a section manager in a regional passport office, who stated that their current accommodation, which was an old Victorian building consisting of a vast number of separate offices, would not easily lend itself to new ways of working. In contrast T.1, responsible for the production of licensed sportswear, described how a change of location had helped the introduction of change:

“The concept of project teams has been accepted and the benefits are being seen. Physically relocating people and bringing them more closely together has improved communications and facilitated teamwork.”

The issue of geographically dispersed project teams introduces the question of the role of Information Technology. Particularly in the context of addressing the potential problems of dispersion discussed in the preceding paragraphs. Certainly in the case of the organisations of M.1 and S.3, the subjects who raised the issue of isolation of staff within the same site, there was no evidence of IT being used as a possible means of communication on work-related activities. Indeed, neither M.1 nor S.3 had access to their own personal computer. It is possible that the utilisation of technology, as typified by organisation R who had a networked system of applications, such as databases and spreadsheets, integrated with a project management system, email and Internet connections, might help resolve the issue of

single-site dispersion. In terms of the role of IT in resolving dispersion of an organisation across sites/countries the survey found conflicting results. The IT system of organisation R, whilst being highly developed, did not link across the two “old” organisations. R.1 identified the geographical dispersion of the two “old” organisations as a current obstacle to a co-ordinated effort to use project management principles more fully. R.1 also believed that the obstacle would be dramatically reduced when the current IT infrastructure, including the networks and systems, was integrated across the new organisation. However, the experience of organisations H and A suggests this optimism may be slightly misplaced. Although not particularly advanced in terms of automated project management systems, organisation H did have a well developed IT system linking the various global sites.

But, as discussed earlier, and as described by H.4 above, this means of remote communication did not compensate for the pressures to prioritise work activities. This pressure, put on a project team members by people in close proximity, can have an adverse effect on the efficient management of projects. Similarly, organisation A had well developed IT systems, but the experiences of A.6 are illuminating. A.6 was the Head of Group Programme Management, responsible for group-wide initiatives such as a £38m programme to prepare for the year 2000 and a £50 programme to achieve cost reductions of £50m. A.6 commented on the inordinate amount of time spent travelling on the motorway between the old “headquarters” of the two merged companies. Such visits were deemed as essential despite the existence of alternative means of communications, such as video conferencing. These comments and experiences suggest that, whilst IT might reduce the seriousness of site dispersion as an issue, it cannot entirely replace the need for, on some occasions, face-to-face contact between project team members. Furthermore, in an organisation that is structured in such a way as to make such contact difficult, any change programme that cuts across sites, such as the introduction of project management principles, would have obstacles to its successful implementation.

5.8.2.3 Management of Change

Fifteen (24% of) subjects commented that issues relating to the management of previous change initiatives could have an influence on the potential success of a change programme to introduce project management. An important issue identified in the survey is the amount of

change an organisation has already gone through in recent years. Such change in some cases leads to “change fatigue”. Nine subjects believed such “fatigue” would make it difficult to get any future initiative to introduce project management principles more fully off the ground.

In the context of influencing the success of future change programmes, this “fatigue” seems to be more of an issue in public sector organisations than in the private sector. Of 9 subjects, who mentioned it as an issue, 7 worked in public sector organisations.

Four of the subjects (M.2, M.3, M.4 and O.1) work in local authority departments, 2 of the subjects (L.2 and L.3) work in a university, and 1 subject (S.1) works for an agency linked to the home office. The 7 subjects account for 44% of all subjects in the survey working in these three environments (a total of 8 subjects work in local authority departments, 5 subjects in a university and 3 subjects for an agency linked to the home office). Comments indicate that the subjects in the public sector perceive the changes as being either inappropriate to their organisation or imposed on them from outside. The comments of O.1, a Library Manager, are typical: “There would be cynicism from staff - we have already followed some business trends (Investors in People, Quality)”. Whilst in terms of change imposed from outside, L.2, the Head of Computer Information Systems in a university, said:

“There has been so much cosmetic change - nothing significant, with much of the change forced by external bodies, such as funding agencies. There is a collective weariness.”

This perception of widespread cynicism and weariness within the organisation contrasts with the views of the subjects in the private sector organisations.

For example, H.1 stated that the large amount of past change initiatives already undertaken in an organisation, supplying components for automobiles, might lead to a future change programme to introduce project management more fully across the organisation being seen by employees as “just another flavour of the month.” However H.1 believed this would only be the view of a small proportion of the workforce, given that they had witnessed so much foreign competition and its effect adverse effect on the businesses of fellow UK automotive component manufacturers. These comments suggest that in private sector organisations, where the business sector is characterised by intense competition, constant change is less

likely to be viewed as inappropriate and imposed; but rather, as a necessity for business survival.

The survey indicates a belief that bad experiences of past changes can be an obstacle to any future initiatives. Five subjects (A.3, H.1, H.2, L.3 and S.1) gave specific examples of failed initiatives that had left a residue of scepticism and potential resistance amongst staff. The experiences of A.3, Client Services Manager for a Financial Services organisation, are typical:

“We had a major change programme two years ago - facilitated by an external group, which involved all staff. It was announced but never managed. People saw problems and opportunities, but there was nobody people could go back to. There were no terms of reference and eventually it fell apart.”

In contrast to the adverse effect of unsuccessful initiatives, a number of subjects believed that potential obstacles would be reduced by the success of previous change programmes. H.1, a product team leader for an automotive component manufacturer, and P.1, production controller within a private utility, gave examples of large scale change programmes that had been successful.

In summary, the survey found general consensus amongst the 15 subjects that, to some degree, the negative impact of past changes, could be overcome through introducing the change in the right way (although this optimism was less strong in subjects in the public sector citing “change fatigue”). The main lesson learnt by subjects from the past initiatives, both the successful one’s and the unsuccessful one’s, was that, in the words of A.3, “it (the introduction of project management principles) will work if it is managed as a project.”

Subjects also identified specific critical success factors for the successful management of such a project. These critical success factors can be categorised as:

Recognise the need to change behaviour/perceptions (and the time taken to achieve such a change):
C.1, D.4 and P.1,
Package and present it in the right way: M.3 and M.4,
Sell the benefits: M.3, O.1 and S.1,
Ensure the right ownership of the process (and be careful of the use of outside consultants/advisors):
L.3, U.2 and O.1,
Demonstrate its worth through its operation: M.2 and P.1,
Ensure it involves the development of a formalised programme management system: H.1 and P.1.

5.8.3 Strategy

The impact of an organisation's strategy, either past, present or future, was regarded as a potential obstacle to the use of project management principles by the following subjects:

- O.1 (Manager of community library services)
- B.2 (Production engineer for an organisation refining lead-based chemicals)
- D.3 (Head of Project Procurement Group)
- D.4 (Head of Engineering Management Development).

The responses of the first 2 of these 4 subjects suggests that a strategy of cost cutting within the organisation may be perceived as an obstacle to the further utilisation of project management. Any benefits realised from carrying out project work more effectively will be translated into the removal of cost from the organisation rather than into improved "working conditions" for employees. Subject O.1 articulated this influence:

"There has been, and is, a strategy for reducing the headcount and the hours/pay for remaining staff. Each year there is an annual round of discussions about redundancies. New projects need to be reconciled with the resource issue. For example, a project for a new IT system leads to less books, which leads to less hours for staff."

A related issue, stated by D.3, is the implications for project management of a strategic decision to reduce capital spend and to out-source parts of the organisation not regarded as the "core competence". This strategy leads to a reduction in project work and difficulties in justifying the "...overheads involved, such as a Project Office (D.3)."

A final issue highlighted was a lack of clarity in terms of the strategic direction of the organisation. D.4 described how the organisation comprised of many semi-autonomous groups. These groups were called, by the Chief Executive Officer, "all one family"; yet the strategic direction of the whole organisation, in terms of defining the levels of freedom of each group within the organisation, was less than clear. This led to problems with respect to the current project to introduce a common project management approach across the whole organisation.

5.8.4 Structure

Seven subjects mentioned obstacles relating to the existing structure of the organisation. Five of these 7 subjects described potential obstacles relating to general organisational structures,

whilst the remaining 2 subjects stated problems with the structure used for the management of projects.

With reference to general organisational structures, 2 subjects, A.5 (a business consultant) and L.2, stated that an initiative to introduce project management principles more fully would be more likely to succeed if reward and recognition systems could be aligned to project work. However, the current way in which their organisations were set up made this difficult. In the case of L.2, an employee in a university, this problem might be expected, given the relatively rigidity of a national-based pay bargaining system.

Two subjects in organisation H (H.1 and H.4) stated that the current structure for new product design, development and manufacture was very much based on a sequential process (called “the five phase model”), with different parts of the organisation responsible for different parts of the five phases. H.1 and H.4 described how this structure sometimes led to “inter-functional dissonance”, with a lack of communication and understanding between different parts of the organisation. This was exacerbated by the fact that the various groups responsible for implementing the five phase model were located across three different continents. In the worst cases this led to products being thrown “over the wall” from one part of the organisation to the next. H.4 believed that a new strategy of involving the parts of the organisation responsible for post design/development activities earlier was starting to rectify this problem.

The new strategy was leading to improved cross-functional teamwork and co-operation, which, in turn, had a beneficial effect in the area of multi-disciplinary project team work and increase in the likelihood of project management principles being more widely accepted across the organisation.

Subject S.3, an employee within The Passport Agency, stated that the current organisation structure would be a possible obstacle to any initiative to introduce a project management approach that cut across the different regions. S.3 described how each regional office was autonomous and had completely different modes of operation. For example, one regional office would resolve problems with incorrectly completed passport application forms, whilst

another regional office would automatically return them to the applicant. Two subjects in organisation B - B.1 (a maintenance engineer) and B.3 (Works Engineer), described how, in keeping with the organisation's core business of refining chemicals, the current structure was geared towards the needs of production and, in particular, maintaining levels of output. To facilitate this, a "functional-based" matrix structure was employed, with project managers having "...not enough authority, but plenty of responsibility (B.3)". Both subjects believed that any attempts to raise the profile of project management would need to be accompanied by a change of structure towards a more "balanced" or "project-based" matrix. The key requirement was a raising in the status of project managers, in comparison to functional managers responsible for production.

5.8.5 Design of Project Management System

Seven subjects highlighted potential obstacles relating to the design of any system for the management of projects. Comments highlight the perceived intrinsic difficulties of developing a system that is applicable to a diverse range of project environments within any one organisation. Responses of the 7 subjects indicates two broad areas of concern: flexibility and accessibility. The need for a flexible system, mentioned by 5 of the 7 subjects, was graphically illustrated by A.1:

"Flexibility needs building into the project management system. Project management is like a light we carry in the dark to highlight any pitfalls. The question is, what load is it worth carrying - a torch or a searchlight? That depends upon various factors, such as how fast we want to go and the scale of the potential pitfalls."

All 5 subjects questioned whether their organisations were capable of designing such a system. As articulated by F.2, a consultant responsible for mechanical engineering training and consultancy "...there is no problem with the principle (of utilising project management more fully), but with the practicalities."

The problem of system access was stated by 2 of the 7 subjects - D.2 and H.3 (a senior project engineer). They raised the question of who takes responsibility for developing the system and for ensuring its accessibility in the sense of making it "readable" and "read". In this respect, D.2 and H.3 present somewhat conflicting opinions. D.2 suggested that "project management practitioners" are perhaps not the best people to develop the system, especially if it involves documenting processes and procedures. There is a danger of a system being

developed that is too complex, for example, with too much terminology, and, hence, inaccessible to all but a few highly experienced project managers. H.3, on the other hand, highlighted the problem of letting “people who sit in an office with no experience of working on the shop-floor” take the lead, with the likely outcome being a system that won’t work in practice.

In the context of accessibility, the experiences of organisation F are pertinent. The organisation was in the process of developing a project management system, using the goal of achieving accreditation for a quality management system, with its requirements for written processes and procedures, as the main driver. Although the project was being managed by one of the “practising” consultants within the organisation, a key resource was a “non-practising” graduate in English specifically employed on the project to address issues associated with language and terminology. Despite being in the early stages of development, the initial views of the subjects were that, despite other misgivings, the system was, at the very least, understandable and accessible.

5.8.6 Change Management Programme

5.8.6.1 Lack of Senior Management Commitment

Eleven subjects raised the issue of senior management commitment. The responses of these 11 subjects can be grouped into two categories.

Firstly, those subjects (6 out of the 11) who believed the obstacle would be caused by non-specific inadequacies at senior management level. All 6 subjects believed there would be difficulties in getting senior level buy-in and commitment, in the words of A.6, from people “...more used to flying by the seat of their pants.”

Secondly, 5 subjects, who, whilst not believing there were general inadequacies with senior management, did believe that there were specific obstacles at this level of the organisation that would need to be overcome. These obstacles were:

Demonstrating senior management buy-in a large hierarchical-structured organisation: C.1,
Recognising the key principles of project management (including its required competencies, structures and roles/responsibilities: C.4, J.2 and N.1,

Recognising the time involved in (and the method - with an emphasis being placed on not just doing things at the start but keeping the momentum going through, and beyond, implementation, for) introducing such a change into the organisation: C.1 and L.1.

5.8.6.2 Selling of Benefits

Eight subjects mentioned selling the benefits of further utilisation of project management as an obstacle. Five of the 8 subjects described issues relating to the “mechanics” of selling the benefits. For example, “the difficulty of quantifying benefits, how much you would save from delivering future project benefits earlier (A.1) and the time involved in selling the benefits across a large, geographically dispersed organisation, “where everyone will need to have their say (J.3 – New Product Introduction Manager).”

Perhaps a more intractable obstacle, mentioned by 3 subjects, is a perception that, whilst benefits might be realised by the organisation, the results of improved project performance at the individual level is often the taking on of more work. Taking on project work would result in increases in workloads and stresses in environments where employees already feel overburdened. For example, M.4, working in a local authority, described how increased efficiency had led to an almost intolerable situation in which 30 members of staff were dealing with 31,000 incoming customer calls in a 12-week period. In this situation, any initiative to utilise project management principles more fully would struggle to convince people that the resultant “benefits” would not lead to staff taking on even more work.

5.8.6.3 Implementation

Eleven subjects stated that the initial investment, in terms of resources, would be an obstacle. The main difficulty, mentioned by 8 of the 11 subjects, was finding the time to work on any new initiative. As articulated by C.3 (a senior project engineer in the Systems and Services Group of an aerospace and defence manufacturer):

“There would be a conflict between work pressures and working on the changes. Especially as priority and measurement are based on the main business function. Everybody goes to the meetings and agrees it’s a good idea - but there are other priorities.”

The comments of C.3, and of the other 7 subjects stating people’s time as an issue, possibly reflects the fact that projects are managed in a matrix structure. All 7 subjects anticipated their involvement in introducing project management principles more fully as being on top of

their current day job. A less widely perceived obstacle, in terms of resources, is the potential lack of people with the right skills to implement such a project (mentioned by A.4, I.1, Corporate Resources Manager in a county council, and R.2).

5.8.7 Operation of Project Management System

A number of subjects raised issues relating to providing resources for operating a project management system. These issues included the level of resources involved or the knowledge and expertise of resources required. Eight subjects stated that a problem would be having the right amount of people to work effectively in an environment with more of a focus on projects. In a similar fashion to the perceived negative consequences of improved project performance, the 8 subjects believed the operation of a project management system would carry an “overhead”. This would be either in the resources required to operate it or in the amount of extra project work undertaken, in addition to other day-to-day duties, required under the new way of working.

This was a particular issue in organisations that have experienced an element of “downsizing” in recent years. Three of the 8 subjects worked in an organisation that had experienced a 25% reduction in head count, mostly at the middle management level, in the last five years. This reduction had not been mirrored by a corresponding reduction in output. The fear of the consequences of introducing a more project focused approach to work - i.e. more projects to manage in addition to existing workloads, is articulated by M.6, the Head of Libraries:

“The problem is there are no capacity cushions in the organisation. The organisation was set up to manage £2.5m of “basic services”. Yet we have generated another £2.5m of funds externally for a variety of capital and revenue work. Some of this extra work is taken on extra at night and during the weekend. There is a danger of “project fatigue”.

Eleven subjects stated that the skill levels of existing staff might not match the requirements of working to a new project management system; and that providing the training for these people might be difficult, due to the lack of time and the lack of money. One of the 11 subjects also raised the issue of whether it might not be possible in some cases, despite any training initiatives, to match skills to requirements. In the words of P.1, production controller in a department responsible for the maintenance and development of power systems: “... we

need to be selective on people. Not everybody is capable and not everybody wants to do it.” In terms of current training initiatives, 3 subjects felt that there was currently an inadequate focus, especially at the middle management level, in terms of providing the skills required in order to effectively manage projects. I.1 described how there were “...a lot of junior/middle managers with little on-going management training, with any project management training not integrated with other management development”. N.1 stated that “...training has focused on the shop floor, because most of the improvements have been at that level - with self-managed teams and “ownership”. Whilst U.2, Chief Process Engineer in the Process Planning Department, described how “...training has focused on computers and team-building in the context of a department. There has been a lack of training in project management.”

Five subjects mentioned problems associated with the day-to-day operation of a project management system. The common concern was the difficulty of ensuring roles and responsibilities were assigned to ensure employees were sufficiently motivated and empowered to operate within the demands of any new system.

5.9 Concluding Remarks

The results presented in this chapter allow a number of broad conclusions to be drawn in respect of the research hypotheses stated in Chapter 2, Section 2.5.1. These conclusions will be useful when discussing the research questions relating to the hypotheses, see Chapter 8.2.

The outcomes from the statistical tests suggest that the characteristics of the organisation in which subjects work does not have a significant influence on whether projects are perceived as being applicable vehicles for managing all types of business change, rather than being exclusively used to manage major, capital-intensive activities. The test results do indicate, though, that subjects whose main project experience is in newer work areas, such as organisational change projects, are more likely to subscribe to the broader definition of a project than subjects whose main project experience is in traditional project areas, such as construction and engineering. This has implications in terms of the possible use of employees as change agents, in terms of selling project management. This issue is included in the discussion of the results in Chapter 8.

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There is no indication in the statistical results to suggest that the specific uses of project management vary depending upon the characteristics of the organisation, a subject's involvement in projects, or the degree of success of a TQM-related programme. The only significant difference found was that subjects in organisations with a strong project-focus believe project management is more useful in eliminating competing ideas than do subjects in organisations with less of a project focus. This difference probably reflects the larger proportion of project work, as a percentage of all work undertaken, carried out in project-focused organisations.

The test results suggest that the degree of project-focus, corporate membership of the APM and, to a lesser extent, whether an organisation is in the private sector or the public sector, does have an influence on the extent to which benefits are anticipated from project management. However, this influence only relates to certain benefit areas. Although subjects in project-focused organisations anticipate higher levels of benefit in the areas of

- Reducing time to market
- Enabling us to better meet customer requirements
- Increasing responsibility for work carried out
- Enhancing career opportunities
- Breaking down hostility to organisational change,

they do not anticipate higher levels of benefit in the other nine areas considered. Subjects in corporate APM member organisations anticipate higher benefits in the same areas as project-focused organisations, except they do not significantly differ with subjects in other organisations in their anticipation of benefit in the area of better meeting customer requirements. Public sector subjects anticipate significantly higher benefit only in terms of using project management to provide a better overview of strategy than do subjects in the private sector. In the other thirteen benefit areas there are no significant differences between public and private sector subjects. No significant differences in anticipated benefits, in any of the fourteen areas, was found between subjects in manufacturing organisations and service organisations.

Finally, the statistical test results suggest that a subject's involvement in projects does not influence the level of anticipated benefits. Specifically, the results show that involvement in projects in the following ways:

- Main project experience working on "soft" projects

Main role in projects as a programme/project manager
Involved in the development of project management processes/procedures
With an overseeing/multi-project role

has no influence on the anticipated levels of benefit in any of the benefit areas.

CHAPTER 6

RESULTS: PROJECT STRUCTURES

6.1 Introduction

The previous chapter presented the survey results relating to the use of project management in organisations. This chapter reports the findings of the survey in terms of the project structures in existence in organisations.

6.2 Structures for Managing a Project

All 62 subjects surveyed stated that, to some degree or other, a matrix project structure was employed within their organisation. The survey results indicate that, within the matrix structures described by subjects, the lines of power and responsibility between the project team and the functional areas providing resources varies.

Subjects working in the following organisations:

- C (a manufacturer in the aerospace and defence industry)
- D (involved in nuclear fuel reprocessing)
- H (a manufacturer of electronic components for the automotive industry)
- J (a manufacturer of telecommunications products)
- R (a supplier of information technology services)

described structures akin to a project matrix. In these organisations the balance of power lay with the project managers, with horizontal integration across the organisation ensuring the multi-functional nature of project teams.

In the following organisations:

- L (a university)
- M (a metropolitan borough council)
- S (a regional passport agency)
- T (a leisure and sportswear manufacturer),

where there was less of a tradition, and emphasis, on project work, the structures equated more with a functional matrix. Here staff responsible for projects had to obtain and manage project resources through negotiation with the appropriate line managers.

In four of the organisations, C, H, J and R there was also evidence of “hybrid” structures,

incorporating elements of a dedicated project team and a matrix structure. For example, C.2, C.3 and C.4 worked in areas of the organisation where large defence-related “programmes” (with attached multi-projects) were being undertaken: namely, “Aircraft” and “Naval Ground Systems”. Their day-to-day activities and line management reporting were project-focused, yet the nature of the work required them to interface with, and bring in resources from, other parts of the organisation (outside their own “programme” area). Similarly, J.3, J.4 and J.5 worked in project-focused groups introducing new products in the areas of “Payphone Systems” and “Public Networks”. The same elements of a dedicated team, as described in the case of C above, were present, but the organisation also operated a matrix structure to ensure full multi-functional integration (with, for example, a software developer from “Public Networks” being potentially utilised in other areas of the organisation).

The perceived benefits of the project structures utilised in a subject’s organisation are given in Table 6.2.1. Frequency diagrams can be found in Appendix 6.1.

The frequencies show similar distributions for 8 of the 9 benefit areas, with a left skew indicating a tendency towards “agreement” that the project structure is beneficial in the area. The exception to this tendency towards agreement is in the area of “making us more innovative/creative. Of these 8 benefit areas, the strongest tendency towards agreement relates to facilitating multi-functional teamwork with a cross fertilisation of ideas/information”. The mean scores confirm the relative levels of agreement.

Whether operating a project or functional matrix structure, or a hybrid structure, discussions of the benefits, and problems, of the structures in existence highlighted the importance of cross-department/organisation co-operation and control. In some cases, such as organisation C (a manufacturer of aerospace and defence products) and parts of organisation D (a nuclear fuel reprocessor), this co-operation and control was regarded as essential in ensuring project objectives were met.

A key feature about the structures described in these organisations was that the all “departments” were focused on achieving individual project goals. However, in some

cases, this focus on achieving individual project goals, whilst benefiting specific individual projects, was not necessarily regarded as desirable for the organisation as a whole. For example, subjects in other parts of organisation D described the phenomenon of “projectitis”, where an individual project would acquire excess resources and an unwarranted priority at the expense of other projects. The survey suggests that one of the characteristics of this phenomenon is project staff, with other possible calls on their time, giving excess attention to one particular project. This seems to be the result, in part, of individual project managers’ ability to build strong channels of communication, co-operation and control between the project and the staff located in the departments supplying resources to projects.

Table 6.2.1 Perceived Benefits of Project Structures (Total = 57)**

<i>Perceived Benefit</i>	<i>S.A.</i>	<i>A.</i>	<i>N.</i>	<i>D.</i>	<i>S.D.</i>	<i>D.K.</i>	<i>*Mean</i>
Facilitates multi-functional teamwork with a cross-fertilisation of ideas/information	18	29	6	3	0	1	1.86
Makes us better able to meet customer requirements	17	24	12	2	1	1	2.00
Ensures effective management of the project objectives	13	26	10	7	0	1	2.16
Promotes the sharing of experiences and organisational learning	10	31	9	6	0	1	2.16
Makes us more flexible and responsive to change	10	26	16	4	0	1	2.21
Ensures a cost effective use of resources	8	25	14	6	1	3	2.26
Ensures the local view is given pre-eminence	3	22	20	8	1	3	2.53
Ensures the multi-project, strategic view is given pre-eminence	6	20	17	11	1	2	2.56
Makes use more creative and innovative	3	16	18	18	1	1	2.91

(* excluding Don't Know's ** six subjects did not answer)

Measuring Instrument (and Key)

<i>Strongly Agree (S.A.)</i>	<i>Agree (A.)</i>	<i>Neutral (N.)</i>	<i>Disagree (D.)</i>	<i>Strongly Disagree (S.D.)</i>	<i>Don't Know (D.K.)</i>
1	2	3	4	5	

By way of contrast, subjects in organisation J (a manufacturer of telecommunications products) described inadequacies of their structures relating to a failure of all departments to focus on achieving individual project goals. The inadequacies were typified by the comments of J.4, a project manager responsible for new product introduction in a company

developing state-of-the-art telecommunications equipment. J.4 stated that "...cross-functional teams in a matrix structure are not the best way of introducing new product developments". Although described by J.4 as a "matrix structure", the involvement of other functions on projects carried out in J.4's department was based solely on the managers of these functions co-operating in the release of resources.

6.3 Structures for the Strategic Co-ordination of Multi-Projects and for the Centralised Support of Project Management Activities

Twenty six (42% of) subjects agreed that there was "a structure for the strategic co-ordination of multi-projects", 42 (67% of) subjects disagreed and 9 (15% of) subjects didn't know.

Twenty one (34% of) subjects agreed that there was "a structure providing centralised support for the management of projects, such as a Project Office or a Project Support Administration Group", 32 (51% of) subjects disagreed and 9 (15% of) subjects didn't know.

The subjects describing these two types of structure were spread across 16 of the 22 organisations.

The following 6 organisations:

- I (a county council)
- K (a firm of solicitors)
- O (a city council)
- S (a regional passport agency)
- T (a manufacturer of sports and leisurewear)
- V (an insurance broker)

showed no evidence of either type of structure being in existence. Organisations I, O, S and T were carrying out portfolios of projects, yet there were no apparent structures to support the management of the programmes. These 6 organisations were amongst those organisations with no tradition of managing projects.

The survey results show that 7 of the 8 organisations classed as "project-focused" had subjects whom described the existence of both types of structure in their organisation.

The organisations in which subjects described structures for the co-ordination of multi-projects included both those from the traditional public sector and those from the private sector (2 organisations, with 5 subjects; and 12 organisations, with 21 subjects, respectively). By contrast, no public sector employee described the presence of a structure for the centralised support of the management of projects.

The results of the statistical tests for the hypotheses testing the relationship between the existence of structures for the strategic co-ordination of multi-projects and for the centralised support of project management activities and the characteristics of an organisation are shown in Table 6.3.1.

Table 6.3.1: Chi Square Test Results – Existence of Structures for the Strategic Co-ordination of Multi-projects and for the Centralised Support of Project Management Activities by Organisation

<i>Factor</i>	<i>Structure Exists</i>		<i>Chi Square Value (Pearson) (n)</i>
	<i>Yes</i>	<i>No</i>	
	a. strategic co-ordination of multi-projects		
Project-focused	15 (11.5)	8 (11.5)	*3.82 (52)
Not project-focused	11 (14.5)	18 (14.5)	
	b. centralised support of project management activities		
Project-focused	13 (9.5)	11 (14.5)	*3.87 (53)
Not project-focused	8 (11.5)	21 (17.5)	
	c. strategic co-ordination of multi-projects		
Manufacturer	11 (8.5)	6 (8.5)	2.18
Service provider	15 (17.5)	20 (17.5)	
	d. centralised support of project management activities		
Manufacturer	11 (7.1)	7 (10.9)	*5.26
Service provider	10 (13.9)	25 (21.1)	
	e. strategic co-ordination of multi-projects		
Public-sector	5 (7.0)	9 (7.0)	1.56
Private-sector	21 (19.0)	17 (19.0)	
	f. centralised support of project management activities		
Public-sector	0 (5.5)	14 (8.5)	*12.49
Private-sector	21 (15.5)	18 (23.5)	

*Critical chi-square value is 3.84 at the 5% level, so reject H_0 : There is no association between existence of structure and organisation factor and accept H_1 : There is an association .

The results suggest project-focused organisations are significantly more likely to have structures for the strategic co-ordination of multi-projects and for the centralised support of project management activities than organisations with no such focus.

Being a manufacturer or a service provider does not significantly influence the existence of structures for the strategic co-ordination of multi-projects. Being a public-sector or a private-sector organisation also does not significantly influence the existence of structures for the strategic co-ordination of multi-projects.

The comments of public sector employees seem to suggest two influences on the development of structures for the strategic co-ordination of multi-projects in such organisations. Firstly, the existence of IT projects, which often lead to “pockets of project management maturity”, in terms of project-related structures. For example, subject M.2, an Assistant Chief Executive Officer in a local authority, described a structure for co-ordinating projects that cut across departments. However, although this structure was only in place for IT projects, M.2 mentioned “...the possibility of having a similar structure in some departments for prioritisation and resource allocation.” Secondly, in other local authority departments there was evidence that existing organisational structures, such as those used for co-ordinating capital spend and for monitoring revenue, were being used to co-ordinate groups of projects.

Manufacturing organisations are significantly more likely to have structures for the centralised support of project management activities than service organisations. Also private- sector organisations are significantly more likely to have structures for the centralised support of project management activities than public-sector organisations.

Table 6.3.2 shows the functions carried out by a centralised project structure. The results show that such structures are associated with a wide variety of roles. These roles range from project-administration type activities, where the structure does not necessarily have a high level of power in terms of the management of projects, to the development of processes/procedures and prioritisation, where the structure usually has a high level of influence over the way projects are managed. This is illustrated by the fact that 4 of the 6 most commonly cited functions (cited as existing by over 45% of subjects in each case) might be classified as “low-power and low-influence”. These are:

- Project administration,
- Central repository for project information,
- Project monitoring,
- Project Reporting.

Two of the functions, “Development of project management processes/procedures” and “Prioritising projects”, might be classified as “high-power and high-influence”. The absence of any widespread existence of “high-power and high-influence” structures is consistent with the general absence of structures for the co-ordination of multi-projects (reported above).

Table 6.3.2: Function of Structure for Centralised Support of Project Management Activities (subjects may select more than one function)

<i>Function</i>	<i>f</i>	<i>Valid %</i>
Project administration	15	71.4
Development of project management processes/procedures	15	71.4
Central repository for project information	15	71.4
Prioritising projects	12	57.1
Project monitoring	12	57.1
Project reporting	12	57.1
A centre for expertise in such areas as planning and estimating	11	52.4
Project audits	11	52.4
Project management education and training	11	52.4
People allocation and assignment	10	52.4
Project selection	10	47.6
Risk analysis	9	14.3
Project review	9	14.3
Issue/change management	5	7.9
What if? analysis	4	19.0

Valid Cases 21 Missing Cases 42

6.4 Structures for Selecting People to Undertake Project Roles

Twelve (21% of) subjects agreed that a formal structure for selecting people to fulfil a specific project role existed in their organisation. Forty four (76% of) subjects disagreed that such structures existed, 2 subjects (3%) did not know and 3 subjects did not answer.

Table 6.4.1 shows that organisations with a strong project-focus are significantly more likely to develop formal structures for selecting people to undertake project roles than organisations with no such focus.

There was little evidence that, amongst the organisations with a formal structure for selecting people to fulfil project roles, the structures incorporated selection methods based on an assessment of skills/competencies. The results suggest the formalising of the

selection process does not necessarily mean a change in the selection criteria from experience-based to skill or competency-based. Rather, the survey found that the formal systems in the project-focused organisations were one's in which experience and qualifications were recorded in a centralised, computerised database (in the less formal systems such information would be held by personnel or by individual department managers). Although called "skills databases" the computerised systems contained little information about a subject's skills/competencies against relevant criteria, such as those listed on the Association of Project Management's certification self assessment form. The difference between a "formal" selection system and other "normal" selection systems seemed to be in the method for storing, and accessing, the same information.

Table 6.4.1: Chi Square Test Results – Existence of Structure for Selecting People to Undertake Project Roles by Organisation Factor

<i>Factor</i>	<i>Existence of Structure for Selecting People to Undertake Project Roles (expected frequency)</i>		<i>Chi Square Value (Pearson) (N)</i>
	<i>Yes</i>	<i>No</i>	
Degree of project focus			
- High	10 (6.0)	18 (22.0)	*6.79 (56)
- Low	2 (6.0)	26 (22.0)	

*Critical chi-square value is 3.84 at the 5% level, so reject H_0 : There is no association between the existence of a structure and organisation factor and accept H_1 : There is an association.

The survey also found that in a number of project-focused organisations, formal structures for selecting people to fulfil project roles the fact that such structures/systems were not universally known to be in existence. Only 2 out of 6 subjects identified the existence of such structures in organisation A (a supplier of banking and other financial services). One of 4 subjects identified their existence in C (a manufacturer of aerospace and defence products), two of 4 subjects in D (a nuclear fuel reprocessor), 2 of 5 in J, and 1 of 4 in R.

This, in itself, is not necessarily indicative of a problem, as those subjects involved in people selection might be the one's who know of the existence of such systems/structures, and vice versa. However, the comments of the subjects in these 5 organisations, on the subject of formal structures/systems for selecting people to work on projects, do highlight two areas of concern.

The first area is a difference of opinion as to the desirability of formalising processes for people selection. This conflict is typified in organisation D. Subject D.1, the Head of Project Management in the Engineering Division of the company, described how the organisation was moving away from a selection process based on various subjective criteria to a more formalised one using self-assessment of skills/competencies (based on the APM 's self certification model). This development was not welcomed by D.3, the Head of Project Procurement (formerly Head of the Engineering Division), currently responsible for awarding all project contracts both inside and outside the organisation. D.3 commented: "We are moving towards an analytical and clinical assessment of staff, which is not as good as judgement and is a failure of line management." This indicates that in some organisations, formalising of the selection process may be equated with a move away from a mainly judgmental-based method towards new, though less reliable, methods.

The second issue is the ability of an organisation to implement such structures and systems, even when they are universally accepted as desirable. The first problem is the difficulty of accurately recording non-technical skills/competencies. As described above, this has been tackled in some organisations through self-assessment. Some organisations, though, are struggling with this activity. Subject A.1, Communications Services Manager in a corporate function, described the problems in their organisation of setting up a database containing records of employees' skills/competencies:

"It's patchy. There is one, but it's not as up-to-date as it should be and it's not as comprehensive as it should be. In some areas - computer programmers - we have quite detailed information of what languages they are familiar with and what their most recent projects called for. It peters out when we come to project management skills. We recognise that - we have a shortfall. It's easier to define the skills/competencies in technical areas. We often tend to judge it on a subjective assessment of the success of past projects. We recognise it and we are trying to address it - but it is difficult."

The second problem is dealing with the organisational implications of any formalising of the selection process. For example, subject R.1, the Project Management Focus Group Leader, described how, in the past, the organisation had attempted to set up a skills database to aid the selection process. This activity had only been partially successful, with the initiative running into difficulties as the different groups in the organisation failed to agree as to who would have responsibility for developing and maintaining the system. There were also concerns, raised by people involved in the selection of people to work on

projects in their part of the organisation, as to how the new system would impact on their power and authority to make decisions. It is illuminating that in describing the current initiative to set up a skills database, R.1 admitted that it would be confined to only one part of the organisation. Putting forward the view that the problems experienced in the past would still cause difficulties if attempts were made to roll out its implementation into other parts of the organisation.

The survey results suggest the existence of a quality management system may influence the development of structures for people selection. The two subjects in non-project focused organisations testifying to the existence of such structures, see Table 6.4.1, described how formal structures for people selection had developed to meet the external assessment requirements of a quality management system. However, these formal systems were distinguishable from other less formal systems by a higher level of documented “records” concerning an employee’s experience, qualifications and past training, rather than by the selection criteria used.

6.5 Structures for Developing People to Undertake Project Roles

Fifty seven (90% of) subjects stated that they had received training in at least one of the areas shown in Table 6.5.1. Five subjects (8%) had not received training in any of the areas (one subject did not answer). Over 60% of subjects had all been provided with training in a broad range of non-technical areas. These areas are managing people, team building, project management methods/tools and leadership.

Table 6.5.1: Areas of Training (subjects may select more than one)

<i>Function</i>	<i>f</i>	<i>Valid %</i>
Managing people	40	69.0
Team building	37	63.8
Project management methods/tools	37	63.8
Leadership	36	62.1
Quality Management	29	50.0
Technical (specialist discipline)	25	43.1
Finance	23	39.7
Other	21	36.8
Marketing	10	17.2
None	5	8.0

Valid Cases 62 Missing Cases 1

The three subjects in the “Other” category described methods for mentoring from experienced project managers, and development of communication and team building skills outside the organisation (Chamber of Commerce and Self-study).

In terms of the structures present for providing project management-related training, the largest proportion of subjects (20 (35% of) out of 58 subjects) stated that the training was structured using a mixture of formal and ad-hoc methods. A further 19 (36% of) subjects stated the training was planned in an ad-hoc manner. Eleven (21% of) subjects stated that training was formally structured as part of career and personal development.

The spread of subjects across organisations, based on the way training is structured, indicates few examples of a consistent organisational approach. In only one organisation (C – a manufacturer of aerospace and defence products) did all subjects (4 in total) agree that the same approach was adopted; namely, “Formal as part of career development”. In all other organisations, where more than 1 subject was interviewed, the existence of up to four different approaches was described.

The approach adopted by organisation C shows a link between the structure of project management training and a move towards a skills/competency-based approach to people selection. Training in the organisation was structured with two broad aims: to develop a subject’s career and to provide a subject with the skills/competencies required for managing specific projects. To this end the organisation identified the following 9 “core” skills/competency areas:

- Introduction to project management,
- People in project management,
- Applied project management”,
- Project Inceptor (a software package),
- Project planning,
- Risk management,
- Contingency management,
- Supplier management”,
- Financial control.

The “development suite” covered a total of 60 skill/competency areas (including the 9 identified above). The following are examples of other skill/competency areas: Assertiveness, Interviewing, Team building, Communication” and “Creativity”. Details of the skills/competency areas are held in training and development manuals, with the

proposed training for each person working in the project environment based on developing skills/competencies in these areas. The plan is recorded in a training record, reviewed twice yearly, and would be achieved through a mixture of formal training courses and on-the-job training. This approach, albeit in a diluted form and without such an emphasis on project management-specific skills/competencies, was indicative of the approaches described by the other 27 subjects whose training was either solely planned as a formal part of career development or in conjunction with more ad-hoc methods.

For those 39 subjects who described an ad-hoc approach, either exclusively or in addition to a formal process, a similar, though informal, process of matching existing skills/competencies to the required project role was evident in the work environment.

The survey results suggest that a match of skills/competencies to project role is not always achieved on a consistent basis. The experience of organisation A (a supplier of banking and other financial services) is pertinent in this context. Subjects described a diverse approach to training in the same work environment. Three subjects stated the planning of training was “ad-hoc as the need arises”, 1 subject stated it was “a mixture of both ad-hoc and formal methods”, 1 subject stated it was based on “mentoring” and 1 subject stated there was “none”.

Subject A.4, a Business Consultant Manager, described how the organisation had attempted, but failed, to introduce an organisation-wide project management methodology. As part of this initiative a training needs analysis had been carried out with 60-70 key project managers in the organisation.

The project managers were asked to identify the 10 most important competencies required for managing projects, grouped into the areas of: “people”, “technical”, “emotional drive” and “organisational”. The results of this analysis demonstrated a clear split in the organisation based on which of the two “old” companies the subject had previously worked for (prior to their merging into one). Those project managers who had worked for one of the “old” companies (A) rated “technical”, “emotional drive” and “people” skill/competence areas as the three most important, whilst those who had been in the other “old” company (B) rated “emotional drive”, “people” and “organisational” areas as most

important.

These differences seemed not to be caused by the types of project work being carried out, but rather by the different business philosophies of the two “old” companies. Company (A) had put an emphasis on the effective management of key business processes. Linked to this was the utilisation of information technology, as a means of gaining competitive advantage, to better manage these processes. This philosophy led to the use of speed, cost-effectiveness and “technical functionality” of the IT solutions as important criteria for measuring project “performance” (reflected in the high rating for the “technical” skill/competency area). The importance attached to processes was reflected in the project management approach used within the organisation. In the words of A.3 (Client Services Manager, Group Information Services), company (A) was “...very mature in terms of standardised project management controls and procedures”, with an emphasis on “process management”. In company (B) there was less emphasis on the management of processes (and the use of information technology as a means of process improvement). Company (B) was more “people-oriented”, with the measures of project management performance being linked the contribution to effective team working (reflected in the high rating for “people” and “organisational” skill/competency areas).

6.6 Matching Capability to Provide People to Undertake Project Work To Demand

The largest proportion of subjects (24:39%) agreed that their organisation’s capability to provide enough of the right people to carry out project-related work was decreasing. A slightly smaller proportion (22:35%) believed the capability of the organisation was increasing. The remaining subjects (16:26%) stated that capability was fairly constant. Five subjects did not answer.

The 24 subjects who believed their organisational capability was increasing were spread across all types of organisation. Table 6.6.1 shows that, compared to non-project focused organisations, project-focused organisations are not significantly more likely to be seeing an increase in capability. Similar results are reported in relation to service/manufacturing organisations and in relation to public-sector and private-sector organisations.

Table 6.6.1: Chi Square Test Results – Increase in Capability to Supply Enough of the Right People to Carry Out Project Work by Organisation Factor

<i>Factor</i>	<i>Increase in Capability</i>		<i>Chi Square Value (Pearson) (n)</i>
	<i>Yes</i>	<i>No</i>	
Project-focused	14 (11.2)	15 (17.8)	2.10 (62)
Not project-focused	10 (12.8)	23 (20.2)	
Manufacturer	8 (8.9)	15 (14.1)	0.24 (62)
Service provider	16 (15.1)	23 (23.9)	
Public-sector	7 (6.2)	9 (9.8)	0.63 (62)
Private-sector	17 (17.8)	29 (28.2)	

Critical chi-square value is 3.84 at the 5% level, so do not reject H_0 : There is no association between increase in capability and organisation factor

The survey results highlight the forces, facilitating and restraining, influencing changes in an organisation’s capability to provide enough of the right people to carry out project-related work. A summary of the results is provided in Figure 6.6.1.

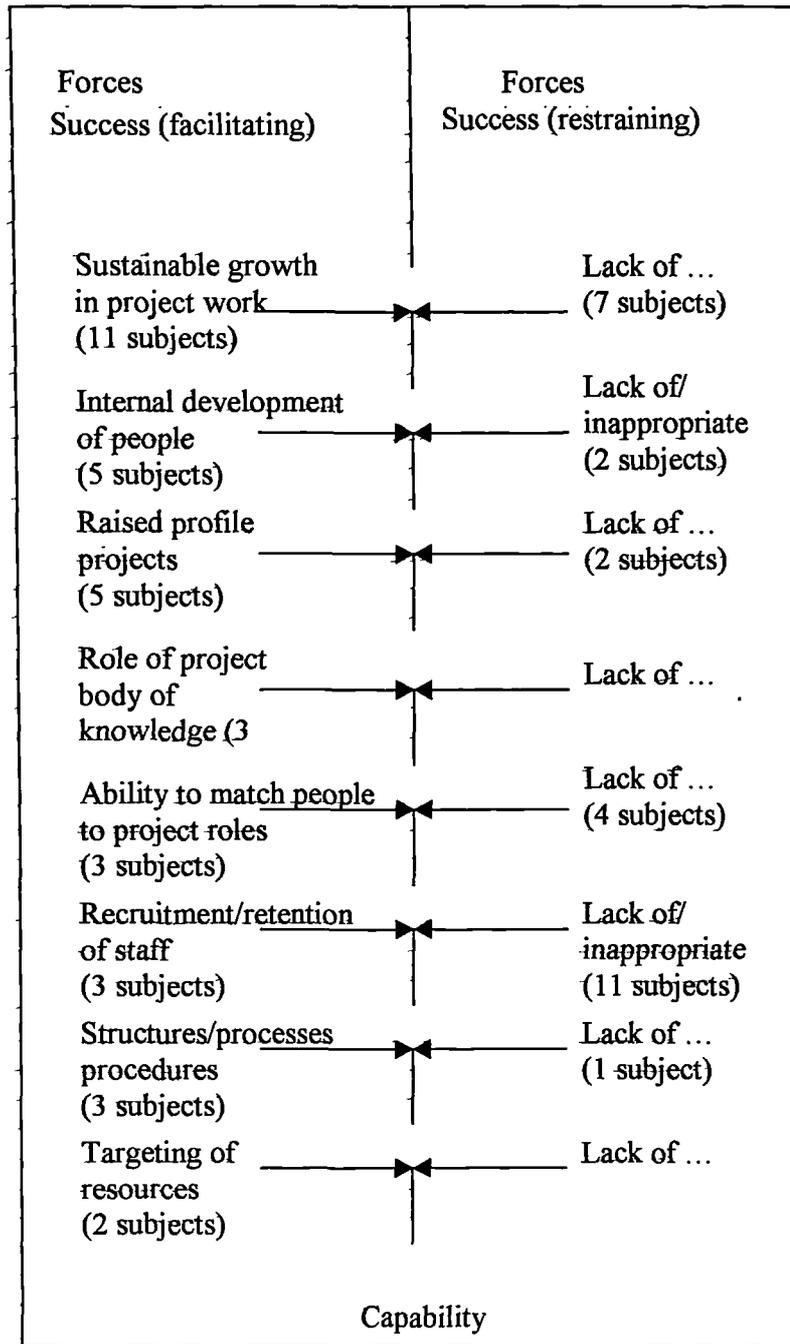
This shows that, based on the responses of the 24 subjects stating that capability was increasing, there are 8 facilitating forces influencing a change in capability in a positive fashion. These forces are:

- Increase in project work,
- Internal development of staff,
- Raised profile for projects and project management,
- Role of project management body of knowledge
- Ability to match people to project roles,
- Recruitment/retention of people,
- Structures/processes/procedures
- Targeting of resources within the organisation.

Each of the 24 subjects identified at least one facilitating force. The 24 subjects described the presence of a total of 35 different forces, grouped into the 8 categories above. Other subjects also identified six of these 8 facilitating forces as restraining forces. The 22 subjects who agreed that their capability was decreasing described the presence of a total of 27 restraining forces, spread across the 6 categories.

The most commonly cited facilitating force (11 subjects) was an “increase in project work”. The 11 subjects stated that, because there was more project work to do, staff members were learning by experience. Comments from the 11 subjects suggest that this positive effect is linked to the force of “ability to match people to project roles”.

Figure 6.6.1: Generalised Force-Field Analysis Of Capability Provide Enough Of The Right People To Carry Out Project-Work



An increase in these two forces is linked to changing attitudes both at senior management levels in the organisation and within the staff at lower levels. For example, the comments of O.1 (a library manager for a city council) indicate the influence of a willingness of senior management to give more people the opportunity to participate in projects:

“In the past the Head of Department was the project manager for all projects. Now there is a realisation that with more and more projects being carried out using the same people leads to overload and other people are being drawn in.”

A reciprocal keenness on the part of the staff at lower levels to become involved in project work is illustrated by the example given by subject S.3 (a manager in a regional passport agency): “A lot of people are interested in being responsible for doing things. For example, examiners want to be involved in the project to re-design the passport application form.”

The common thread throughout the subjects’ comments about the positive influence of more project work, and hence more project experience, is that this increase in project work does not lead to staff becoming over-worked or over-burdened. For those 7 subjects who believed an increase in project work was a negative force, this thread was absent; replaced by a commonly shared view that an increase in project work, which is not matched by an increase in resources, is not, in the long term, sustainable. Most of the 7 subjects testify to an increase in individuals’ capabilities through such factors as learning from experience and better processes/procedures. These increases are more than offset by the steeply rising demands being put on these individuals. The effects of this imbalance are summarised by A.1 (Corporate Communications Services Manager for a banking and financial services organisation):

“The business is demanding more projects, so we are stretching our internal resources to the full. The existing resource base is becoming more experienced and productive - but there is only so far you can go with efficiency improvements and we are right up against it. People start making mistakes.”

The negative influence of an increase in project work was ranked second, in terms of frequency of mention, of the 6 restraining forces. The force cited most often as leading to a reduction in capability was an inability to retain or recruit staff (cited by 12 subjects). The most commonly stated reason for this inability was the structural changes, mainly in the form of downsizing, “forced” upon the organisation in response to changing business

environments. In terms of capability to manage projects, these downsizing activities had been particularly negative as “...they had got rid of the wrong people” (quote from subject D.2 – a project manager in nuclear fuel reprocessing organisation).

Another organisation had “...lost experienced personnel due to early retirement or re-deployment” (quote from subject B.3 – Works Engineer for refiner of lead and related chemicals). In addition, a number of subjects cited problems with reward & recognition systems as the reason for the loss of staff. These problems are typified by the comments of A.4 (the Business Consultant Manager), D.4 (Head of Engineering Management Development) and A.2 (Information Systems Manager) respectively: “Good people are leaving because they are not recognised as being good. There is no reward and recognition,” “We do lose good people and there is a debate about “training people to leave”,” and “...people are going to other organisations at higher rates of pay.”

The second ranked facilitating force (5 subjects) was the internal development of people, through formal training and staff development programmes, rather than the informal on-the-job experience described above. Conversely, 2 subjects cited the formal development of staff as a force restraining an increase in capability.

In stating that a policy of developing project managers into line managers was - naturally enough - having adverse effects on the capability of the organisation, subject A.3 (Client Services Manager) described a reduction in capability to provide people to manage projects. However, U.1’s description of how a policy of developing staff to be generalists rather than technical specialists was having an adverse effect on the ability to successfully manage projects with a high technology level focused more on the issue of providing people to work on projects. In the words of U.1 (senior electrical engineer for an automotive manufacturer):

“5 - 10 years ago we had 5 or 6 electrical engineers. Now we cover other areas and are supposed to be multi-skilled in electrical, mechanical and civil engineering. It is often difficult to understand what is going on during the technical projects.”

The issue of matching people to jobs was ranked as the third most cited restraining force on capability (mentioned by 4 subjects). Each of these 4 subjects described the reduction in capability in terms of providing people to work on projects rather than people to manage

such activities.

Two main reasons were identified. Subjects A.3 and H.4 (Project Team Leader of automotive component manufacturer) cited the problem of matching people to project roles in environments where technology was changing fast. H.4, for example, described how a change in the technology used in the manufacture of components for the automotive industry has led to "...a need for software development and electronic skills, which we are currently lacking; though we are going through a re-training exercise." The other 2 subjects cited a failure of the selection process. G.1, the IT Manager for a manufacturer of office seating, stated that the most capable people within the organisation were not selected due to time and resource availability issues. Subject A.2 described the adverse affect of a matching of people to project roles based on "The Peter Principle". With subjects matched to a project, not on an assessment of their ability to carry out the required role, but on their success in previous, though unrelated, roles, with the result that people eventually reach their "level of incompetence".

By way of contrast, 3 subjects stated how the ability to better match people to project roles had increased organisational capability. These 3 subjects worked in organisations where a large amount of project work was undertaken. It was clear from the discussions that, in their opinion, organisation capability was based on the ability to select people to manage projects. The importance of this selection process was emphasised by C.1 (Head of Project Management for provider of aerospace/defence products), who stated, when discussing the potential manager of a forthcoming £500m project, that "...there is a big internal population, but a dearth of highly experienced project managers. It takes three months to find the right person, longer if we go outside."

Subject C.1, and also D.1, the Head of Project Management in the Engineering Division, worked in an environment where steps had been taken to introduce a formal process to select a project manager based on an assessment of skills/competencies. Both subjects stated that development of the project management body of knowledge, particularly in relation to the required skills and competencies of the project manager, was having a positive effect on people selection. These 2 subjects, along with subject R.1 (the manager of the Project Management Focus Group for supplier of Information Technology services),

also stated the positive influence of the project management literature in other areas besides the selection of project managers. In these 3 organisations the development of the project management “profession”, with its attendant recognition of best practice based on the literature, was seen as raising the capability of the organisation to provide people to manage projects.

Five subjects mentioned the positive effect of raising the profile of projects and project management. Three of these subjects worked in organisations with no strong tradition of managing projects. In these organisations, all 3 subjects mentioned the importance of senior management in increasing awareness of the role of projects. The other 2 subjects, R.3 (a project manager in the *Project Management Focus Group*) and R.4 (the Project Office Manager in the *Project Management Focus Group*), also testified as to the importance of senior management. In the case of organisation R, development of expertise in the management of projects was formally stated as one of the organisation’s key aims. A consequence of this positive involvement of senior management was recognition, by the management, of a set of roles/skills linked to both the management of projects and to working in project teams. By contrast, for 1 of the 2 subjects who stating that the lack of a profile for project management restrained capability, this recognition did not exist. Whilst for the other subject the lack of visibility of project management had led to reduced satisfaction for staff working on projects, with a consequential negative effect on capability in terms of reduced potential performance.

Three subjects stated that external recruitment had increased organisational capability, though each of these 3 subjects also stated that there had been a parallel initiative to increase the skills and competencies of existing people in the organisation. Whilst perhaps increasing capability to provide people to work on projects a rise in headcount was not universally regarded as positive in terms of capability to manage projects. For example, subject R.2 (infrastructure project manager) described how the organisation environment was one of many new initiatives with increased demands for people with project skills, but “...the people being recruited by the organisation are more commercially oriented than project managers.”

*

Three subjects mentioned the role of project management structures/processes/procedures in facilitating an increase in capability: although one subject stated that the lack of a structure for controlling “bids” for project funding and the subsequent management of those projects was contributing to a reduction in organisational capability. A final facilitating force, mentioned by 2 subjects, was the targeting of resources within the organisation. One subject described how focusing funds into projects was leading to an increase in the capability to carry out project work. The other subject stated the positive effect on the capability to manage projects of channelling technical resources into projects as a support function, and hence freeing up project managers to manage projects.

The results suggest that the goal is not always to increase the numbers of people capable of managing projects. Subject D.3, the Head of the Project Procurement Group, described how the organisation was seeing a decline in its capital projects and a trend towards outsourcing project work. This would have implications for the levels of demand for project managers in the future and the skills set required to meet the future demand. This leads to a possible emphasis being placed on the co-ordination of contracts with outside bodies. Subject D.4 (Head of Engineering Management Development), in describing how the organisation’s capability to provide people to manage projects was increasing, stated that the future challenge for the organisation may be to manage a decrease in the capacity to supply project managers in line with the reduced demand.

6.7 Structures for the Evaluation of Performance on Projects

The survey reveals that 41 (72 % of) subjects from a total of 57 have, either implicitly or explicitly, their performance evaluation linked to project work. The largest proportion (35: 62%) had performance evaluated “Outside individual projects but against objectives specifically related to project-related activities”. A further six (11 % of) subjects stated that evaluation of their performance was “Built into the project management process of individual projects”. Sixteen (28%) of subjects did not have their performance evaluated against project-related objectives.

Typically the evaluation of performance outside individual projects but against objectives specifically related to project-related activities involved a form of management-by-objectives, where the specified objectives to be met are stated in terms of business and

personal targets; and these targets will be met, in part, by carrying out projects. Subject C.1 (the Head of Project Management) described this process in their organisation as “the value planning process”. The Chief Executive Officer of the organisation had 6 - 10 individual objectives broken down under the headings of The European Foundation for Quality Management (EFQM) model and these “values” were cascaded down through the organisation in the form of individual business and personal objectives. Meeting these objectives is often, though not always, achieved through projects.

The six subjects stating that evaluation of their performance was built into the project management process of individual projects were all heavily involved in projects as part of their day-to-day role. Five of the six subjects worked as project managers and 1 subject working as a member of a steering committee within a programme management function. These 6 subjects worked in 4 organisations (D, H, R and U) in which the focus of their functional work areas is typified by a need to bring new products, services or systems to customers. (New fuel reprocessing facilities for the 1 subject in D, new automotive components for the 2 subjects in H, new information systems and new staff accommodation for the 2 subjects in R, and new automotive manufacturing facilities for the 1 subject in U.)

The most common project success criterion built into the measurement of performance was meeting time objectives. There was less evidence of explicit measures for cost and quality built into performance evaluation, although one subject stated that control of costs was achieved, in part, through the meeting of time-to-market targets.

The comments of subjects suggest there may also be differences in the way an organisation claims to deal with performance evaluation and how it takes place in practice. This difference is typified by experiences of subjects working in organisation R. The organisation had established a formal project management process that built evaluation of a project manager’s performance into the closure stage of the project life cycle. However, 2 of the people interviewed from the organisation, subjects R.1 (the manager of the Project Management Focus Group) and R.3 (a project manager in the same department) did not believe their performance was evaluated by this method. Rather they stated that it was evaluated against wider business-related goals that indirectly linked to individual projects.

For R.1 this was not an issue, as the subject worked in a managerial capacity.

On the other hand, R.3, as a practising project manager, was adhering to the requirements of the project management process, which, in theory, linked performance to evaluation. R.3 had recently received a performance appraisal with their line manager. To further their case for reward and recognition, in the form of promotion to an unfilled vacancy within the project environment, R.3 had taken to the meeting a number of Project Closure Documents from projects they had managed in the past. These documents contained high ratings, by the client, for R.3's performance. However, when assessing the effectiveness of the appraisal process after the event, subject R.3 felt the ratings were not taken into consideration. R.3 left the appraisal meeting feeling very frustrated and de-motivated, believing that performance on projects had had no material effect on the outcome of the appraisal. These experiences certainly highlight a conflict between the objectives of the individual and the needs of the organisation. R.3's objective was promotion, whilst, perhaps, the organisation felt it was not best served by such a move. But they also indicate, at least in the view of subject R.3, an inconsistency between actual performance on projects and subsequent reward and recognition.

The problems of linking project work to performance evaluation were also evident in organisation F (a small company providing engineering training and consultancy) who had recently embarked on a project approach to work. As part of this approach, all consultancies and training programmes were classed as projects and the consultants were designated project managers. To facilitate effective performance, the organisation had considered giving a proportion of the profit made on "projects" to the consultants responsible for managing them. However, the idea had been deemed unworkable. There were worries, especially from the consultants, about the effect on teamworking, in terms of sharing ideas, information and resources.

Consultants in organisation F also expressed concerns about being evaluated against goals, objectives and targets that they had had no input in establishing. The issue of evaluation against objectives was directly related to perceived weaknesses, on the part of the consultants, in the way projects were initiated. Two consultants felt a problem was the behaviour at director level during project start up. The consultants believed the Director(s)

committed to work for purely commercial and business-related reasons, with little analysis of the client's requirements nor with an assessment as to the organisation's capability to deliver. One consultant felt the Director(s) level attitude led to "...a lack of preparation, a 'yes-can-do' approach and an over-optimistic view of our capabilities". The other consultant felt it led to a conflict between people carrying out the sales role and people carrying out a project role, with the problem being caused by a misplaced confidence in the likelihood of receiving orders for work. Both consultants felt the Director(s) level attitude led to poor performance specifically citing the meeting of time and cost objectives. As one consultant said: "The failure to involve the consultant early in the project's life leads to problems with unrealistic timescales and going down dead ends, it is a barrier to good project management". Two consultants also identified the lack of consultant involvement in the early stages of a project as another main problem area. This led to a lack of ownership and commitment to the goals of the project, with the belief on the part of the consultants that they were allocated projects to manage that had unrealistic timescales and cost objectives.

Of all the organisations surveyed, only company C (a manufacturer in the aerospace and defence industry) seemed to have attempted to address this problem of "ownership" of objectives through the "value planning process". Objectives derived from this process were linked to personal development programmes and performance/profit related pay. As stated by subject C.1:

"...the system doesn't work too badly in practice, the value planning process does not evaluate the performance of individuals against specific project objectives; rather it evaluates achievement, which are more likely than not to be through projects, in meeting business and personal objectives that are above and beyond the day job".

6.8 Concluding Remarks

Broad conclusions can be drawn, from testing the individual hypotheses, in respect of the influence of an organisation's degree of project-focus on the existence of project management-related structures. The results indicate that organisations with a strong project focus are more likely to have the following structures than other organisations

For the strategic co-ordination of multi-projects
For the centralised support of project management
For selecting people to undertake project roles.

This suggests that the assumption, contained in the Statement of the Problem, that the level of focus on project work in an organisation is linked to the establishment of such structures is a valid one.

In terms of the assumption that the level of focus, importance, or scope of project management might be greater in manufacturing or private-sector organisations, and hence lead to a greater level of use of such structures in these types of organisation, there are a number of conclusions to be drawn. The existence of structures for the centralised support of project management are more likely to be found in manufacturing organisations than in service organisations and in the private-sector than the public-sector. This suggests that, for these types of structure, the assumption might be valid. However, the results suggest that the existence of structures for the strategic co-ordination of multi-projects is not influenced by whether an organisation is a manufacturer or service provider. Neither is it influenced by whether it is in the private or public sector. This suggests that there are no differences, perhaps in terms focus, importance or scope of project management, between these types of organisation that might lead one to be more likely to set up such structures than another. In Chapter 8.3 possible reasons for the different conclusions to be drawn in respect of the existence of structures for the strategic co-ordination and for the centralised support of project management are discussed.

In terms of matching capability to provide people to undertake project work to demand, it was suggested, in the Statement of the Problem, that project-focused, manufacturing or private-sector sector organisations might have more experience of undertaking projects. This experience might be reflected in a higher degree of learning in relation to developing the people and processes related to carrying out project work, which, in turn, might lead to an increase in capability relating to the ability to supply people to work on projects. However, in terms of the effect of any methods to increase capability, the statistical results indicate that such organisations are not more likely to see an increase in their capability to supply enough of the right people to carry out project work than other organisations. This issue is discussed further in Chapter 8.3.

Chapter 8.3 also uses the results from this chapter, and the broad conclusions drawn from testing the research hypotheses, to discuss the research questions found in Chapter 2.5.2.

CHAPTER 7

RESULTS: PROJECT MANAGEMENT SYSTEMS

7.1 Introduction

The previous two chapters focused on the uses of project management and the project management structures in existence. This chapter reports the survey results in the final area of interest; namely, project management systems.

7.2 Evolution of Project Management Systems

Table 7.2.1 shows the current status of project management systems. Twenty four subjects (40%) were in organisations with no project management system, but who were currently engaged in the activity of selling the benefits of project management. Thirteen (21% of) subjects stated that a company-wide project management systems, with devolved control, has or was being set up. Such a system, though without the devolved control, was identified as existing by 10 subjects (16%). Twelve (20% of) subjects stated that no company-wide project management system existed and there was no evidence of one being set up. Two subjects did not know and 2 subjects did not answer the question.

Table 7.2.1: Status of Project Management Systems

<i>Status</i>	<i>f</i>	<i>%</i>	<i>Valid %</i>
Benefits of using project management more fully are currently being promoted	24	38.1	39.3
A company-wide project management system, with devolved control, is being/has been set up	13	20.6	21.3
No company wide project management system is being/has been set up, whilst the benefits of using project management more fully are not currently being promoted	12	19.0	19.7
A company-wide project management system is being/has been set up	10	15.9	16.4
Don't know	2	3.2	3.3
No answer	2	3.2	Missing
TOTAL	63	100.0	100.0
Valid Cases 61 Missing Cases 2			

Those organisations with no current system, but who were engaged in selling project management, had no strong project-focus. Included in these organisations were F (a

training and consultancy service), M (a metropolitan borough council) and S (a regional passport agency).

F had embarked on a formal project, including organisation-wide training in project management, to raise awareness in the use of project management. This project had given project management a highly visible status, which is reflected in the fact that all 5 subjects interviewed from F agreed that the benefits were currently being sold (although given the small size of the organisation problems of communicating across a large number of geographically dispersed functions is not an issue).

By contrast M and S did not have a formal programme to raise awareness in project management, rather the initiatives were being carried out on an informal basis by a few individuals. Of 6 subjects interviewed from M, 3 believed the benefits were being sold, 2 believed nothing was happening and 1 believed a centralised system already existed. Of the 3 subjects interviewed from S, 1 believed the benefits were being sold, 1 believed nothing was happening and 1 didn't know the status of project management.

The 6 subjects working in M were located in different parts of the organisation and the variations in answers indicate the lack of a cross-departmental approach to the selling of project management. No such department barriers existed in S and efforts were being made, in advance of some proposed major changes in the organisation, to introduce more project working, albeit in an informal manner.

The survey results show that selling the benefits of project management is not carried out exclusively in organisations with little history of using project management. For example, organisations A (a supplier of banking and other financial services), C (a manufacturer in the aerospace and defence industry), J (a manufacturer of telecommunication products) and R (a supplier of information technology services) are all classed as project-focused and make up 4 of the 5 organisations who are corporate members of the APM. Each of these four organisations had subjects identifying the existence of a company-wide system of project management with devolved control, whilst also having subjects stating that the benefits of using project management more fully were currently being promoted.

Organisation D (involved in nuclear fuel reprocessing), the other corporate member of the APM, also had subjects identifying the existence of a devolved project management system. Although D had no subjects stating that the benefits of project management were currently being sold, the organisation was in the process of embarking on a project, which one of the subjects was managing, to introduce a company-wide approach to the management of projects.

Examination of these 5 APM corporate APM member organisations suggests two distinct phenomena in terms of the evolution of project management systems. Firstly, in C, D and J the desired change of status seems to be in terms of promoting shared learning and standardisation across departments/functions. This process is not seen as a replacement of well-developed, devolved systems of project management, rather as a progression that will complement such systems.

Secondly, in A and R there had been a great deal of organisational change in the recent past, in the nature of mergers with other organisations, and there is evidence that this had led to a backward step in terms of the status of project management. To counter this, the selling of project management is, in part, to overcome the negative impact of the organisational changes and to regain lost ground in terms of the evolution of project management systems.

Of the twelve subjects stating that no company-wide project management system existed and there was no evidence of one being set up, 11 were located in 9 organisations not traditionally project-focused. However, 8 of these twelve subjects had witnessed an increase in the use of project team structures to manage work.

7.3 Project Life Cycle Models

Eighteen (33% of) subjects always used a model of the stages of the project life cycle when managing projects. Twenty eight subjects (47%) sometimes used a model. Nine (16% of) subjects never used a model, whilst 2 subjects (4%) did not know and 6 subjects did not answer.

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7.3.1 Influences on the Use of Project Life Cycle Model

Of the 19 subjects who always use a model, 14 work in traditionally project-focused organisations.

The results of the statistical test of the hypothesis relating to the use of a model of the project life cycle and the degree of project-focus in the organisation is reported in Table 7.3.1. The results suggest project-focused organisations use such models on a significantly more consistent basis than do organisations with no strong project-focus.

Table 7.3.1: Chi Square Test Results – Use of Model of the Project Life Cycle by Organisation Factor

<i>Factor</i>	<i>Use of Model</i>		<i>Chi Square Value (Pearson) (n)</i>
	<i>Always</i>	<i>Sometimes/ Never</i>	
Project-focused	14 (8.5)	12 (17.5)	*9.99 (55)
Not project-focused	5 (9.5)	25 (19.5)	

Critical chi-square value is 3.84 at the 5% level, so reject H_0 : There is no association between the use of a model of the project life cycle and organisation factor and accept H_1 : There is an association

The remaining 5 subjects who always use a model, and who work in organisations with no strong tradition of managing projects, had an involvement, either at the steering committee/strategy level or project management level, with the management of Information Technology (IT) projects. Four of these subjects were E.1 (Customer Project Manager in Customer Services Department of supplier of telecommunications products), M.2 (Assistant Chief Executive Officer of a metropolitan borough council), M.4 (Group Manager of environmental services) and L.2 (Head of Computing and Information Services of a university). Their responses indicate that the use of a project life cycle model was in the context of these types of projects, with the use of formal models being exclusive to IT project work, despite the existence of other types of projects in their organisations.

The 5th subject who always used a model in the non-project focused organisations was M.1, a Senior Economic Regeneration Officer. M.1 described how adherence to a formal bid and monitoring process, as required by an external funding agency, had given rise to a model process for urban regeneration projects. Subjects in other public sector organisations using models “sometimes” made similar comments. The survey results also suggest that

role of a “funding agency” may be a as a catalyst for establishing models of the life cycle in some private sector organisations. Subjects described situations where the funding agency was often another department in the organisation (with the “funding” being a bid for work). For example, subject R.1, the manager of the Project Management Focus Group, described the influence of a process, set up by the department responsible for submitting “bids” for work, on the subsequent management of projects:

“...”Bids” (for external work) follow the Rainbow process (Company-wide), which is used to assess viability and capability. It wouldn’t be used for internal efficiency projects. Rainbow is a decision-making process, but it provides a model for guiding the project”.

A final possible influence on the adoption of formal models, indicated by subjects’ responses, is the requirements of an external customer. Subjects in both private and public sector organisations described demands from customers, both internal and external, in terms of meeting the requirements of the BS EN ISO 9000 quality management system standard. As an ISO 9000 accredited supplier the standard requires critical processes to be documented. Subjects in organisations H (a manufacturer of electronic components for the automotive industry), M and R (suppliers of information technology services) had met this requirement by establishing a documented model project life cycle.

7.3.2 Uses of Project Life Cycle Models

Table 7.3.2 shows classes of use of models of the project life cycle based on the responses of the 46 subjects who use a model of the stages of the project life cycle either “always” or “sometimes”.

Table 7.3.2: Uses of Models of the Project Life Cycle (subjects may select more than one) (n = 46)

<i>Use</i>	<i>f</i>	<i>%</i>
General life cycle management i.e. consistency of approach, problem management, resource management and monitoring of progress	26	49.0
Communication i.e. internal with project staff, other project stakeholders (such as customers)	14	26.4
Pre-implementation activities i.e. work breakdown, client requirements, objectives and cost/benefit analysis	13	24.5
Quality assurance i.e. demonstrating competence	2	3.8

The results suggest three primary uses of such models: general life cycle management, communication and specific pre-implementation activities. The most commonly stated use, stated by 49% of the 46 subjects, was for activities, such as “consistency of approach” and “resource management”, that cover the whole of a project’s life. It needs noting that the uses stated above are, in many ways, inter-linked. For example, using a model to achieve a “consistency of approach” is likely to ensure pre-implementation activities are carried out, and communicating with external and internal groups is likely to help the project “monitor progress” and to ensure “consistency of approach”.

Of the 26 subjects citing factors categorised under “general life cycle management” the most common was “a consistency of approach” (mentioned by 15 of the 26 subjects). Linked to this quest for consistency was an often stated need for activities at different stages of the life cycle, especially those early in the cycle, not to be skipped, rushed or carried out in the wrong sequence. This need is typified by the comments of subject A.6 (Head of Group Programme Management for banking and financial services provider): “...it (the model) is a means for taking projects forward in a consistent way and it avoids jumping from a germ of an idea to implementation.”

Five of the 26 subjects described the usefulness of a model in the context of problem solving. This included the identification and tracking of potential problems. In the words of C.4 (Engineering Manager within group manufacturing defence aircraft): “We can pro-actively identify issues and when they are likely to occur. Then do things one step at a time but being aware of what is and what might happen.”

A further 4 of the 26 described the model’s use for resource management, in particular the issue of resource and role allocation/ prioritisation at different stages of the project life cycle. These points are evident in the comments of L.4, the manager of Estates Management Services, and M.5, the Director of Leisure Services, in describing the usefulness of life cycle models: “...(the model) clarifies individual roles at different stages of the project i.e. different managers at different stages,” and “...(the model) allows the allocation of roles and responsibilities. We need different people at different times.”

The remaining 2 of the 26 subjects included under the heading “general life cycle management” cited “the monitoring of progress” as its primary use.

In terms of a model being a communication tool (mentioned by 14 subjects), the subjects’ responses suggest three different areas of use. The first is in communicating salient project information to interested parties, especially the customer (mentioned by 8 subjects). In this respect, A.1 (Communications Services Manager in Group Information Services) says that a model gives “...clarity of communication, both within the project and outside. Everybody can see what you mean when you say where you are up to”. The second area is in communicating internally with staff directly involved in project work (4 subjects). In this respect J.1 (a business services manager for a manufacturer of telecommunications products) describes how a model is used “...so people know what they are supposed to do and that they understand the process.” This communication tool also ensures a “consistency of approach” discussed above.

A number of subjects highlighted described the benefit of using a project life cycle model in the context of developing a common project language (discussed in Chapter 5, Section 5.5). R.1 (Project Focus Group Manager for supplier of information services) described how their model led to a better, shared understanding of project management across the organisation:

“...when we talk about being in “definition” everybody knows what that means. Also there are words that are used and accepted that are associated with the model. For example, we talk about “generating the project definition report”, everybody knows what that entails, not just project staff, but also customers. We all share the same language.”

By way of contrast, subject A.3 (Client Services Manager within Group Information Services) described how the failure to constantly utilise a model of the project life cycle, coupled with a merger of two organisations into one, had had an adverse affect on the project environment:

“...in the old organisation there was more of a project management culture. We had a model, and a process discipline that we adhered to. Since the merger that culture is not as evident. Some parts of the organisation don’t use the model, so when we talk about PIF’s and PQP’s not everybody knows what we are talking about.”

The third of the 4 uses of life cycle models is for activities associated with the pre-implementation stages of a project (13 subjects). In this area, the influence of the type of project work being carried out is evident, with subjects working on projects with lengthy cycles, in terms of time, citing the usefulness of a model in planning such a project. Subjects C.1 (Head of Project Management), C.3 (a senior project engineer) and C.4 worked in an environment where a high level model life cycle of:

“Business Capture” (to the point of winning the bid),
 “Product/Service Delivery”,
 “In-Service Support” (to the point of finishing the project and providing on-going support)

often spanned 30 years. These subjects described how the model was used at the start of the project to “... break it down into manageable elements (subject C.3).” Other specific pre-implementation activities mentioned by subjects included: “general planning”, “ensuring approval”, “defining objectives”, “identifying client requirements” and “carrying out cost/benefit analysis”.

Finally, 2 subjects described the usefulness of a model as a means of quality assurance: “...it shows to other people how we do things, which satisfies people of your competence (subject D.2 – project manager in Project Procurement Group of nuclear fuel reprocessing organisation).”

7.4 Formalising of Project Life Cycle Activities

Table 7.4.1 shows the proportion of subjects formally carrying out a particular activity in a project’s life cycle.

Table 7.4.1: Formal Activities Carried Out During Project Life Cycle (subjects may select more than one factor.

<i>Factor</i>	<i>f</i>	<i>Valid %</i>
Allocation of project roles/responsibilities	52	91.2
How the project will be structured (i.e. dedicated team)	49	86.0
How the project will be managed (processes/procedures)	42	73.7
How success is defined/measured	41	72.0
The factors influencing success	38	66.7
No answer	7	Missing

Valid Cases 57 Missing Cases 7

Fifty two (91% of) subjects formally allocated roles and responsibilities. Forty nine (86%) formally documented how a project was to be structured. Forty two (74%) undertook a similar formal process regarding the management processes to be used. Forty one (72%) formally considered how “success” was to be defined and measured and thirty eight (67%) looked formally at the factors influencing success.

Table 7.4.2. shows the sequence in which the activities are carried out (it needs noting that activities often run concurrently and, in those cases, subjects were asked to sequence them based on which activity was initiated first).

Table 7.4.2: Sequencing of Formal Activities in Project Life Cycle

<i>Activity</i>	<i>f</i>	<i>Position in Sequence</i>				
		<i>1st</i>	<i>2nd</i>	<i>3rd</i>	<i>4th</i>	<i>5th</i>
Allocation of project roles/responsibilities	52	12	13	13	6	7
How the project will be structured (i.e. dedicated team)	49	13	12	13	8	3
How the project will be managed (processes/procedures)	42	21	4	6	8	3
How success is defined and measured	41	13	8	4	5	11
What factors influence success	38	6	13	6	8	5

This indicates that there is little consistency in the order in which activities are carried out (or initiated). The most common area of agreement is that “how the project will be managed” is started before the other activities in the sequence (stated by over 50% of subjects carrying out this activity). The most evident lack of agreement relates to the position in the sequence of activities associated with defining and measuring project success. Although 13 (32% of) subjects placed this activity first in the sequence, another 11 subjects (27%) of subjects placed it last.

7.5 Project Classification

Forty seven of the 63 subjects surveyed stated that projects were classed, in some way, into different categories. Thirty two (68% of) subjects stated that the way a project was classified influenced the choice of project structure. Twelve subjects (26%) said there was no such influence and three subjects (6%) did not know.

Twenty eight (59%) of the 47 stated that the utilisation of formal project management processes/procedures would be influenced by the “type” of project being managed. Fifteen (32% of) subjects said there was no such influence and four subjects (9%) did not know.

Descriptions of the way projects are classified indicate 6 broad criteria used in the classification process. These criteria, ordered by frequency of mention by subjects, are listed in Table 7.5.1.

Table 7.5.1: Criteria Used for Classifying Projects (subjects may select more than one criterion. (n = 47))

<i>Criterion</i>	<i>f</i>	<i>%</i>
Project characteristics	22	46.8
Type of work	13	27.7
Impact on the business	13	27.7
Degree of risk	3	6.4
Organisation	3	6.4
Project management complexity	2	4.3

The most frequently mentioned criteria listed in Table 7.5.1 (mentioned by 22 subjects), is the “project characteristic” of planned cost, either capital or revenue; with projects being typically classed as either “small/minor” or “big/major”. The cut-off point, in terms of monetary value between the two different “types” varies. A.1 described how “...projects that cost less than £50,000 are “initiatives”, we just get on and do them.” Subjects L.4 and U.1 (senior electrical engineer in a automotive manufacturer’s works engineering function) both stated that £100,000 was the cut-off point between “small/minor” and “big/major”; whilst J.5 (a manager of a public networks product group), in the context of software projects, described how a “big” project was classed as having in excess of £1m development costs. In these examples, the key factor distinguishing between project types is not the absolute cost figure but the relative cost figure, in relation to other organisation variables, such as annual turnover.

Although a project classification based on “cost” suggests a fairly crude process for selecting project management procedures or project structures, comments from subjects suggest a more sophisticated multi-attribute decision criteria method is employed. Most of

the 22 subjects stated that the “size” of the project per se was not the key variable in choosing appropriate structures and procedures. Rather, an increase in the size of the project, in their opinion, usually reflected an increase in other influences, such as the degree of management complexity involved and the consequence of failure to the organisation.

Thirteen subjects stated their organisation used classification criteria based on the “type of work” being carried out. Typical examples are organisation F, a private-sector training and consultancy, who had 3 types of project: “manuals”, “training courses” and “consultancy”; and organisation H and P (a utility supplying electricity) , who distinguished between “New Products” and “Others”.

A further 13 subjects assessed projects in terms of their “impact on the business”. For example, organisation A classified projects as “the vital few” and “others”. The “vital few”, which at any one time number approximately 12, being those projects regarded as being key to achieving the principle aims of the organisation and having the most strategic importance. All other projects, to some degree or other, are regarded as being “optional”. This process was mirrored in other organisations. For example, E.1 described how “major” projects are those deemed as “...vital in terms of their business impact”. B.4 (Head of Maintenance for a refiner of chemicals) described how projects were classed in terms of the “business benefit”. And T.2 (Advanced Concepts and Engineering Manager for a sportswear manufacturer) stated that the “type” of project was “...linked to the importance of the project to the business.”

Two of the 13 subjects using “business impact” as a classification for projects worked in local authorities, where “business impact” is not necessarily assessed in terms of business “performance indicators”, such as increased revenue or reduced costs. In this context, the relationship with the outside community (or their representatives on local authority councils), who staff “respond” to, is a key factor.” For example, M.6 (the Head of Libraries) stated that some projects were classed as “major” if they were “...key tasks which ensure the success of objectives/aims of the (service). These relate to the critical success factors in (service’s) Strategic Plan”; and I.1 (Corporate Resources Manager for a county council) described how a “big” project was classed in terms of “...outside impact”. This

linked to the views of The Authority. It could be a small value (cost) project but have a big impact in terms of equal opportunities and disability legislation. I.1 gave the example of a recent project to provide a new reception area, which was classed as “big” due to the high political profile given to the work (by local authority councillors), primarily due to the issue of access for the disabled. Indeed, the survey found evidence that criteria relating to an organisation’s relationship with the community was also used, in some parts of the private sector, to assess the impact of a project. This was the case in organisations B, a company refining lead-based chemicals and organisation U, a car manufacturer, where “environmental issues” were mentioned as being important by 3 of the 6 subjects surveyed in these 2 organisations.

The responses of the 13 subjects using the classification of “business impact” suggest that the classification process is very much based on a subjective assessment of the project’s impact. Although the assessment is carried out using multi-attribute decision-making criteria (which may include factors from some of the other 5 classification areas, such as “degree of risk” and “cost”). “The degree of risk” was used by 3 subjects as a means of classifying projects into different types. For example, subjects J.1 and J.4 (a project manager) described how projects were either “major”, “medium” or “minor” based on the level of risk. In many ways, this classification is closely linked to that based on “impact on the business”, as the methods described for assessing risk also used *multi-attribute* decision-making criteria (including “cost” and “benefit” to the business).

Three other subjects used classifications that were related to the “organisation structure”, where a project “type” would be matched to the area of the organisation that had responsibility for the management of the activity.

The final classification area, used in some parts of organisations C and D (both corporate members of the APM) was one based on “project management complexity”. C1 (the Head of Project Management), D.1 (also the Head of Project Management) and D.2 (a project manager) described how projects were assessed used the APM’s classification for project “complexity”. The least “complex” involve the management of an “in-house” project with no (or very little) responsibility for external contractors/suppliers, and the most “complex”

involve the management of a multi-disciplinary team from a variety of companies across a number of different companies. The classification process, as well as determining the project structure and processes/procedures to be used, formed the basis for "...career progression based on the management of increasingly "complex" projects" (subject D.2).

7.6 Important Project Success Criteria

Subjects' opinions of the importance of 16 different project success criteria (see Q26 in the Questionnaire) are given in Table 7.6.1. (Frequency distributions can be found in Appendix 7.1.)

Table 7.6.1: Importance of Project Success Criteria (**Total = 60)

<i>Project Success Criterion</i>	<i>V. I.</i>	<i>I</i>	<i>N.</i>	<i>U.</i>	<i>V. U.</i>	<i>D. K.</i>	<i>*Mean</i>
Client perception	50	9	0	1	0	0	1.18
Meeting specified project objectives	46	13	1	0	0	0	1.27
Smoothness of handover	32	22	2	0	2	2	1.55
Responsiveness to change	26	26	7	0	0	1	1.67
Cost effectiveness of work	19	36	3	1	1	0	1.82
Improvement in organisational capability	14	38	5	3	0	0	1.92
Growth of others	13	36	10	1	0	0	2.04
Own personal growth	13	32	11	4	0	0	2.10
Level of disruption to organisation	16	24	16	3	0	1	2.18
Avoidance of non-benefit through early Cancellation	17	28	6	1	5	3	2.20
Enabling of other project work	8	34	15	1	2	0	2.20
Personal non-financial rewards	10	29	15	3	1	2	2.24
Contribution to continuous improvement	7	28	23	2	0	0	2.27
Adherence to defined procedures	7	33	15	4	1	0	2.29
Degree of process innovation	3	28	20	6	3	0	2.63
Personal financial rewards	4	13	21	10	10	2	3.18
Other	4	1					

(*excludes Don't Know's

** three subjects did not answer)

Measuring Instrument (and Key)

<i>Very Important (V.I.)</i>	<i>Important (I.)</i>	<i>Neutral (N.)</i>	<i>Unimportant (U.)</i>	<i>Very Unimportant (V.U.)</i>	<i>Don't Know (D.K.)</i>
1	2	3	4	5	

The two criteria with the highest levels of agreement as to their importance are "client perception" and "meeting specified project objectives", with 84% and 77% of subjects, respectively, stating that these criteria were "very important". This is reflected in the rankings of criteria, based on mean scores. Client perception and meeting specified project

objectives are the two highest ranked scores. The frequency distributions for the other 14 criteria show little evidence of a lack of agreement that they are important measures of success. The exception is “personal financial rewards”, with 33% of subjects saying it was either “unimportant” or “very unimportant” (this contrasts, with “personal non-financial rewards”, which only 7% of subjects believed was an “unimportant” or “very unimportant” criterion of success). Of the remaining 13 of the 14 criteria, the strongest level of disagreement was the 10% of subjects who stated that “the degree of product/process innovation” exhibited during the project was an “Unimportant” or “Very Unimportant” criterion of success. These results are confirmed by the mean scores. The bottom ranked criterion of “personal financial rewards” has a mean of 3.18, which indicates an average opinion between “neutral” and “unimportant”, and the last but one criterion of “degree of product/process innovation” has a mean of 2.63, indicating an average score between “important” and “neutral”.

Table 7.6.2 presents the results of the statistical tests in relation to the hypotheses testing the relationships between the rankings of project success criteria and both the characteristics of an organisation and a subject’s involvement in projects.

The results show there is no significant difference in the ranking of project success criteria between subjects in each of the 8 situations shown in table 7.6.2. In terms of the specific hypotheses, the results provide no evidence of the following:

Organisations with a strong project-focus attach different relative levels of importance to project success criteria compared with organisations with no strong project-focus.

Manufacturing organisations attach different relative levels of importance to project success criteria compared with service organisations.

Private-sector organisations attach different relative levels of importance to project success criteria compared with public-sector organisations.

Table 7.6.2: Spearman's Rank Correlation Coefficient Test Results – Ranking of Project Success Criteria

<i>Variable</i>	<i>Spearman's Rank Correlation Coefficient (n=16)</i>
<i>Organisation Characteristics</i>	
Degree of focus: (high, low)	0.8153
Product Supplied: (service, manufactured)	0.8551
Status: (private-sector, public-sector)	0.9216
<i>Subject's Involvement in Projects</i>	
Overseeing/multi-project perspective: (yes, no)	0.8028
Direct, day-to-day involvement: (yes, no)	0.7729
Involvement in development of project management processes (yes, no)	0.7824

In all 6 paired cases, Spearman's rank correlation coefficient is greater than critical rank correlation coefficient of 0.425, at the 5% level, so reject H_0 : There is no association between the rankings of the two groups and accept H_1 : There is an association.

Table 7.6.3 presents the results of the statistical tests in relation to the hypotheses testing the relationships between the rankings of specific project success criteria and a subject's involvement in projects.

The table shows a significant association between a subject's main project role, either project/programme manager or other, and the perceived importance of the success criterion own personal growth. The table also shows a significant association between a subject's main project work, either on predominantly hard projects or soft projects, and the perceived importance of the success criterion adherence to defined procedures. This evidence tends to confirm the following hypotheses:

Subjects with a direct, day-to-day involvement in projects attach more importance to their own personal growth than do subjects with no such involvement.

Subjects whose main project experience is working on "hard" projects attach more importance to the adherence to defined procedures than do subjects whose main project experience is working on "soft" projects.

Table 7.6.3: Chi Square Test Results – Level of Importance of Project Success Criteria by Subject's Involvement in Projects

<i>Factor</i>	<i>Level of Importance (expected frequency)</i>		<i>Chi Square Value (Pearson) (n)</i>
	<i>Very Important/ Important</i>	<i>Neutral/Unimportant/ Very Unimportant</i>	
<i>Main Project Role</i>	a. the growth of others		Not valid as one e.f. < 5
Overseeing/multi-project perspective	18 (19.6)	6 (4.4)	
No such perspective	31 (29.4)	5 (6.6)	0.01 (58)
Overseeing/multi-project perspective	16 (16.1)	8 (7.9)	
No such perspective	23 (22.9)	11 (11.1)	0.55 (58)
Overseeing/multi-project perspective	8 (6.7)	15 (16.3)	
No such perspective	9 (10.3)	26 (24.7)	
<i>Main Project Role</i>	a. the personal non-financial rewards		0.09 (57)
Project/prog. Manager	19 (18.5)	8 (8.5)	
Other roles	20 (20.5)	10 (9.5)	2.78 (60)
Project/prog. Manager	27 (24.5)	3 (5.5)	
Other roles	22 (24.5)	8 (5.5)	*7.2 (60)
Project/prog. Manager	27 (22.5)	3 (7.5)	
Other roles	18 (22.5)	12 (7.50)	
<i>Project Involvement</i>	a. the personal non-financial rewards		1.07 (58)
Development of project management procedures	26 (24.2)	10 (11.8)	
No such involvement	13 (14.8)	9 (7.2)	2.40 (59)
Development of project management procedures	21 (23.7)	14 (11.3)	
No such involvement	19 (16.3)	5 (7.7)	Not valid as two e.f. < 5
Development of project management procedures	33 (30.8)	19 (21.2)	
No such involvement	2 (4.2)	5 (2.8)	
<i>Main Project Work</i>	a. avoidance of non-benefit through early cancellation		0.03 (57)
Hard	20 (19.7)	5 (5.3)	
Soft	25 (25.3)	7 (6.7)	*6.65 (60)
Hard	22 (17.3)	4 (8.7)	
Soft	18 (22.7)	16 (11.3)	0.07 (59)
Hard	17 (16.5)	8 (8.5)	
Soft	22 (22.5)	12 (11.5)	

*Critical chi-square value is 3.84 at the 5% level, so reject H_0 : There is no association between level of importance of project success criteria and work factor and accept H_1 : There is an association.

With respect to the remaining hypotheses testing the relationships between the rankings of specific project success criteria and a subject's involvement in projects, Table 7.6.3 shows no significant association between a subject's involvement in projects and the perceived importance of the individual success criterion listed. In terms of the hypotheses, the results do not provide significant evidence of the following:

Subjects with an overseeing/multi-project perspective involvement in projects attach more importance to the growth of others than do subjects with no such involvement.

Subjects with an overseeing/multi-project perspective involvement in projects attach more importance to personal, non-financial rewards than do subjects with no such involvement.

Subjects with an overseeing/multi-project perspective involvement in projects attach less importance to the personal financial rewards than do subjects with no such involvement.

Subjects with a direct, day-to-day involvement in projects attach less importance to personal, non-financial rewards than do subjects with no such involvement.

Subjects with a direct, day-to-day involvement in projects attach less importance to the growth of others than do subjects with no such involvement.

Subjects with an involvement in the development of project management processes/procedures attach more importance to personal, non-financial rewards than do subjects with no such involvement.

Subjects with an involvement in the development of project management processes/procedures attach less importance to the level of disruption caused by project work than do subjects with no such involvement.

Subjects with an involvement in the development of project management processes/procedures attach more importance to the improvement in organisational capability than do subjects with no such involvement.

Subjects whose main project experience is working on “hard” projects attach more importance to avoidance of non-benefit through early cancellation than do subjects whose main project experience is working on “soft” projects.

Subjects whose main project experience is working on “hard” projects attach less importance to personal non-financial rewards than do subjects whose main project experience is working on “soft” projects.

7.7 Methods for Managing Project Success Criteria

The results in the previous section showed that client/customer perception is regarded as the most important project success criteria. The results also show that 22 of 60 subjects surveyed stated that they utilised formal methods to manage client/customer expectations and perceptions. Nineteen of these subjects worked in traditionally project-focused organisations and all 5 of the corporate APM member organisations were represented by the 22 subjects. The Chi Square test results in Table 7.7.1 indicate that this is significant and suggests that the following hypothesis can be accepted:

Organisations with a strong project-focus use more formal methods to manage the project success criteria perceived as important compared with organisations with no strong project-focus.

Table 7.7.1: Chi Square Test Results – Use of Formal Methods for Managing Client/Customer Perceptions by Organisation Factor

<i>Factor</i>	<i>Use of Formal Method for Managing Client/Customer Perceptions</i>		<i>Chi Square Value (Pearson) (n)</i>
	<i>Yes</i>	<i>No</i>	
Project-focused	19 (9.9)	8 (17.1)	*24.01 (60)
Not project-focused	3 (12.1)	30 (20.9)	

Critical chi-square value is 3.84 at the 5% level, so reject H_0 : There is no association between use of formal methods for managing client/customer perceptions and organisation factor and accept H_1 : There is an association

The survey also found that in project-focused organisations, where such formal methods were not utilised, there was a desire to introduce such an approach. D.1 (Head of Project

Management in the Engineering division of a nuclear fuel reprocessor) stated: "...we currently don't measure client perception, but we are looking at it". Whilst C.2 (a programme manager in Aircraft Business Team of defence/aerospace manufacturer) articulated the motivation to develop such measures:

"Yes, we'd like to do it and we talk about it a lot - but in terms of getting a specific metric to measure client perception I can't think of one. Though it is important to what we do."

The survey found that some sort of customer questionnaire, measuring the adherence to criteria defined in the post-implementation stage of the project, to be the predominant method employed for measuring perceptions. This questionnaire was administered at the end of the project, although organisation H (a manufacturer of components for the automotive industry) employed a process that involved the measurement of satisfaction in each of four phases of a project. A typical process was described by N.1 (a product manager for an organisation manufacturing soaps, detergents and other related products):

"We have started defining the success criteria for the "project team" - which includes customers and suppliers. The key issue is involvement and we carry out a workshop - often lasting two days. We state the project assumptions, success criteria and areas of concern. This process is crucial - for example, on one project a success criteria was "to have agreed success criteria."

The various parties to the project feel the benefit of such a process. As described by C.3 (a senior project engineer in the Naval Ground Systems Business Team), it leads to the setting of realistic expectation levels by the customer and, importantly, the project team members are motivated because "the project has not been over-sold and achievable objectives have been set."

A distinction was found between those methods that focused on generating a list of unique success criteria (as in the case of N.1 above) at the start of the project and those methods that involved the management of a standard, pre-defined set of criteria. Examples of the latter approach were found in organisations H and R (a supplier of information technology services). Organisation H employed a "scorecard" to measure success at major milestones. The scorecard contained 13 criteria, mainly utilising metrics associated with cost, quality and time (for example "development cost", first time quality" and "product cycle time"). The first of the criteria is "customer satisfaction". This is measured in the definition stage

by “applicable customer requirements document signed by team and customer representative”. A score of 10 is awarded if the criterion is met and a score of 0 is given if the document is not finalised and agreed. In subsequent stages of the project, scores are given based on the results of customer surveys. Organisation R measured 4 criteria - “clear/concise project definition report”, “response to change in project requirements”, “response to project threats” and “help/assistance through project life cycle”. At the end of each project the customer and the sponsor complete a project completion report. This rates the project against these 4 criteria on a scale of A (the best imaginable) to D (does not yet meet requirements).

The survey found some evidence that organisations putting an emphasis on the use of customer surveys/questionnaires had encountered difficulties that raise doubts about the questionnaires effectiveness. This was the case within organisation D, who were involved in nuclear fuel reprocessing. The main issue seems to be associated with the accuracy of the measures and the inability of the project organisation to demonstrate that expectations had been successfully met. D.2 (a project manager in the Project Procurement Group) described how “...there is a problem between perception and reality - and we need to change this. Feedback from one customer was “you are too expensive” - but the customer couldn’t justify it. They also said, “you don’t finish on time” - but we are usually within 116%.” In addition, D.2 highlighted the problem of inundating the client with questionnaires - a point echoed by D.4. (the Head of Engineering Management Development in Corporate Engineering). Finally, D.4 questioned the validity of measuring perceptions only at project close down:

“We need to measure fitness for purpose, but project close down is not necessarily the best time to do it - it is the most fraught time. Indeed, maybe what we need to measure is whether customer satisfaction changes over time and especially if it changes after the project has finished.”

In response to these issues, the organisation looked to develop a more pro-active approach, with less emphasis on expecting the customer to carry out the measurement activities. Success criteria are grouped under the headings of the European Foundation for Quality Management (EFQM) model for achieving business excellence. The project team, rather than the customer, measured the project’s performance in each of the EFQM categories and

provided the customer with the results. Although the customer is asked to confirm the accuracy of the results, the evidence that the project team provides is used to influence the customer's perceptions; so avoiding the problems of "accuracy" described above.

There was less evidence of the utilisation of such methods in the organisations with less of a history of managing projects. Two subjects working in organisation M, a metropolitan borough council, believed the lack of processes for evaluating success was having a major, adverse effect on the long-term development of the organisation. In the words of M.5 (the Director of Leisure Services): "We don't have learning built in. There is a complete body of knowledge and project management literature that we don't tap in to. We keep re-inventing the wheel." In response to this, M.3 (the Quality Manager in the Department of Planning and Development) described a recently established process:

"We pre-define objectives in a Project Quality Plan (PQP) - and measure them. A client satisfaction survey, using a standard proforma, that covers both quality of product and quality of project management process, is carried out. We are moving towards post-project briefing - 20% of project work so far - underpinned by the concept of the learning organisation."

Organisation M's ability to introduce defined processes and procedures in this area seems to have been facilitated by the existence of a Quality Management System (QMS).

M.3 believed the acceptance by staff of the PQP and the post-project review had been facilitated by the "process discipline" that had evolved since the department had been working to the requirements of the QMS.

The survey found evidence to suggest the use of methods for managing success criteria was influenced by the type of project work carried out; with pockets of "maturity" existing in organisations with less of a tradition of managing projects. In particular, subjects L.4 (the manager of Estate Management Services in a university) and M.2 (an assistant Chief Executive Officer) were involved in construction-related projects. Both subjects described well-developed formal methods for managing customer perceptions. In respect of L.4, the methods, which involved "an extensive customer review", were linked to the building of a new library (at a capital cost of £7.5m over 2 years). Whilst for M.2, in his role of project manager for a new £8m leisure centre, the process was crucial to the success of the whole venture:

“The key is to match project objectives to customer satisfaction. This was a key activity on the Leisure Centre project. There was a four-month process - which was very painful - and this continues through the project. There is a mandatory requirement to pre-define success criteria. The client is informed early on. We have to resolve the fact that they have perceptions of what they require.”

A large proportion of subjects stated that they used methods for managing the success criterion of “meeting specified project objectives”. This proportion was made up of 39 (65% of) subjects, including the 22 subjects who employed formal methods for managing client perception. A consistent theme found in the comments of these subjects was the need to link the development and measurement of project objectives to the management of the benefits, especially post-completion. J.3 (New Product Introduction Manager for a telecommunication manufacturer) stated that “...we look at costings against investment appraisal, although I question whether the long-term benefits are really being looked at”. Whilst H.4, a senior manufacturing engineer, described the problem in the context of a current project:

“There is a current project which has stated benefits of “£1m savings in manufacturing costs. That is unlikely to be realised, but no one will analyse why and it will be ignored. (A competitor) have a project group going round looking at post-implementation up to 18 months after a project finishes.”

7.8 The Formalising of Project Roles

The specific roles formally defined and allocated during the project life cycle are shown in Table 7.8.1.

Table 7.8.1: Roles Formally Defined During Project Life Cycle (subjects may select more than one) (n = 52)

<i>Role</i>	<i>f</i>	<i>%</i>
Project Manager	46	76.7
Customer/Client	42	70.0
Project Sponsor	37	61.7
Customer Liaison	26	43.3
Programme Director/Manager	21	35.0
Internal Stakeholder	20	33.3
External Stakeholder	17	28.3
User Liaison	16	26.7
Other	9	15.3

The largest proportion of subjects (over 60% in each case) defined the roles of “project manager”, “customer/client” and “sponsor”. Less than 50% of subjects (in each case) defining the roles of “customer liaison”, “programme director”, “internal stakeholder”, “external stakeholder”, and “user liaison”. “Other” roles formally defined are “project team members”, “team leaders”, “user groups” and “quality assurance”.

The results reveal two trends in project environments influencing the formalising of project roles. The first trend is towards vertical integration, with a number of subjects formally involving suppliers in projects; and recognising this involvement through a formal definition of the supplier’s role.

The second trend is towards partnerships with other organisations. The survey suggests that the process of partnering is found between other groups beside customers and contractors. For example, organisation C had developed a number of “business partners”, providing complimentary or similar products/services, with whom they worked on a number of projects.

The process of developing partnerships with these organisations is described by C.1:

“Over the last 5-6 years there has been a development of “teaming” within the industry, leading to partnerships. These have multi-interfaces. We have learnt from the U.S.A. For example, we have sent out an engineer to work with (organisation) sorting out problems with flight simulators. We also have people working with (organisation). These partnerships help us all.”

Without exception, the end product of the process of formally allocating roles and responsibilities was a written document; given various titles, such as “terms of reference”, “project quality plan” and “project definition report”. However, the survey found that the production of such a document was not universally carried out within organisations. Two broad reasons for this were highlighted.

The first reason was a lack of “process” discipline, for whatever reason, in the project environment. For example, D.4, the Head of Engineering Management Development, describes how roles are defined:

“...on the good ones, yes, but it depends upon the project manager. It is an area currently being looked at. What we find is people forget things, like their responsibility to inform the customer of progress; and they can't ask the right questions, such as, need I delegate the role?”

The second reason was a conscious decision to only carry out such a formalised activity on certain “types” of project. This was the case for 4 subjects working in local authority departments, who stated that the activity only took place on projects that were either IT or construction related. Two further influences, besides the type of work being undertaken, on the formal allocation of roles was the discipline imposed by an outside body such as a funding agency (who required the defining of roles on a proforma bid form) and the requirements set by a quality management system.

7.9 Relevant Project Critical Success Factors

Table 7.9.1 shows subjects' opinions of the relevance of 21 different project critical success factors, see Q31 in the Questionnaire. (Frequency distributions are in Appendix 7.2)

The results show a pronounced left skewing towards agreement that the following factors influence project success or failure:

- Project manager's ability to co-ordinate
- Project manager's commitment
- Team member's commitment
- Top management support
- Team member's communication skills
- Team member's technical background
- Project manager's perception of their role
- Team member's problem solving skills
- Actions of external clients/competitors/sub-contractors/suppliers
- Project manager's ability to delegate authority
- Project structure
- Functional manager's support
- Project champion's skills

There is little evidence of disagreement that these factors influence success. (In terms of number of subjects, the highest frequency answering either “strongly disagree” or “disagree” in each of these 13 areas was 4 - in the case of “project manager's ability to make trade-offs”.)

The factors showing no such strong tendency towards “agreement” that they influence success are:

- Project size/value
- Uniqueness of project activities
- Forces of nature
- Urgency of project
- Management complexity of project
- Project Manager’s technical competence
- Political/Economic/Social/ Technological Environment
- Project Manager’s ability to make trade-offs.

For these factors 40, 28, 19, 19, 12, 8, 8 and 7 subjects, respectively, either “strongly disagreed” or “disagreed” that the factor influenced success.

Table 7.9.1 Relevance of Project Critical Success Factors (Total = 63)

<i>Project Critical Success Factor</i>	<i>S.A.</i>	<i>A.</i>	<i>N.</i>	<i>D.</i>	<i>S.D.</i>	<i>D.K.</i>	<i>*Mean</i>
Project manager’s ability to co-ordinate	44	17	1	0	0	0	1.28
Project manager’s commitment	44	17	1	0	0	0	1.28
Team member’s commitment	32	28	0	0	0	1	1.44
Top management support	33	27	1	0	0	0	1.48
Team member’s communication skills	19	39	2	0	0	1	1.69
Team member’s technical background	23	32	3	2	0	1	1.71
Project manager’s perception of their role	24	31	5	1	0	0	1.72
Team member’s problem solving skills	17	38	5	0	0	1	1.87
Actions of external clients/competitors/sub-contractors/suppliers	19	31	9	2	0	0	1.90
Project manager’s ability to delegate authority	44	17	1	0	0	0	1.92
Project structure	14	36	8	2	0	1	1.93
Functional manager’s support	11	42	7	2	0	0	1.97
Project champion’s skills	11	30	14	1	0	5	2.08
Project manager’s ability to make trade-offs	9	31	10	7	0	4	2.12
Urgency of project	11	24	7	19	0	0	2.25
Political/Economic/Social/Technological (PEST) environment	10	25	15	8	0	3	2.25
Management complexity of project	12	27	8	11	1	2	2.28
Project manager’s technical competence	8	26	19	8	0	0	2.44
Forces of nature	3	15	20	18	1	2	2.79
Uniqueness of project activities	2	17	14	24	4	0	3.18
Project size/value	2	5	14	28	12	0	3.71
Other	5	2					

(*excludes Don’t Know’s)

Measuring Instrument (and Key)

<i>Strongly Agree (S.A.)</i>	<i>Agree (A.)</i>	<i>Neutral (N.)</i>	<i>Disagree (D.)</i>	<i>Strongly Disagree (S.D.)</i>	<i>Don’t Know (D.K.)</i>
1	2	3	4	5	

The relative importance of the different success factors is confirmed by their rankings, based on mean scores. The same 8 factors with the highest number of subjects disagreeing that the factor is an influence, as mentioned in the previous paragraph, occupy the last 8 positions in the table (with only a few minor changes in position based on frequency of disagreement or mean scores).

The results show that factors associated with stakeholders to a project, such as the project manager and senior management, are generally perceived as important influences on project success. The anomaly to this is the critical success factor of “project manager’s technical competence”, where only 34 (55% of) subjects either agreed or strongly agreed that it had any influence on success or failure. This provides evidence that some subjects subscribe to the view that the important role of the project manager is as a generalist rather than as a technical specialist. This is confirmed by the critical success factor of “project manager’s ability to co-ordinate” being rated the most important of all factors.

However, comments by subjects surveyed show that the importance of a project manager’s technical skills may change depending upon the environment in which the project is being undertaken. For example, subject R.1 (the manager of the Project Management Focus Group for a supplier of information technology services) stated that “... a highly technical project will have a team member’s technical background as a key factor, but not all projects have a high technical component.” Indeed, the survey sample was chosen to include a diverse range of types of project (including those with a low technical component and those with a high technical component). The sample also elicited opinions from subjects with less of a direct involvement in the management of projects (through roles such as member of steering committee). It is possible that a sample comprising of a larger proportion of project managers or project team members, involved in highly technical projects, might have resulted in a higher ranking for “project manager’s technical competence”.

Table 7.9.2 presents the results of the statistical tests relating to testing the relationships between the rankings of project critical success factors and both the characteristics of an organisation and a subject’s involvement in projects.

Table 7.9.2: Spearman’s Rank Correlation Coefficient Test Results – Ranking of Project Critical Success Factors

<i>Variable</i>	<i>Spearman's Rank Correlation Coefficient (n=16)</i>
<i>Organisation Characteristics</i>	
Degree of focus: (high, low)	0.9174
Product Supplied: (service, manufactured)	0.9515
Status: (private-sector, public-sector)	0.9336
<i>Subject's Involvement in Projects</i>	
Overseeing/multi-project perspective: (yes, no)	0.9430
Direct, day-to-day involvement: (yes, no)	0.9626
Involvement in development of project management processes (yes, no)	0.9252

In all 6 paired cases, Spearman’s rank correlation coefficient is greater than critical rank correlation coefficient of 0.425, at the 5% level, so reject H_0 : There is no association between the rankings of the two groups and accept H_1 : There is an association.

In terms of the characteristics of an organisation the results show no evidence that:

Organisations with a strong project-focus attach different values to the relative levels of relevance of project critical success factors compared with organisations with no strong project-focus.

Manufacturing organisations attach different values to the relative levels of relevance of project critical success factors compared with service organisations.

Private-sector organisations attach different values to the relative levels of relevance of project critical success factors compared with public-sector organisations.

Likewise, in terms of a subject’s involvement in projects, the results provide no evidence of the following:

Subjects with an overseeing/multi-project perspective involvement in projects attach different values to the relative levels of relevance of project critical success factors compared to subjects with no such involvement.

Subjects with a direct, day-to-day involvement in projects attach different values to the relative levels of relevance of project critical success factors compared to subjects with no such involvement.

Subjects with an involvement in the development of project management processes/procedures attach different values to the relative levels of relevance of project critical success factors compared to subjects with no such involvement.

7.10 Methods for Managing Project Critical Success Factors

Subjects’s descriptions of the methods used to manage success and failure factors suggests 4 levels of “maturity”. In descending levels of maturity these are:

- explicit formal methods,
- implicit formal methods,
- intuitive informal methods,
- no methods.

In terms of the highest level of maturity, 22 (36%) of the 61 subjects who discussed the methods for managing success and failure factors described the use of explicit formal methods in their work environments. The methods being explicit in the sense that they lead to critical success/failure factors being documented in some form. Twenty of these 22 subjects worked in traditionally project-focused organisations. The Chi Square test results in Table 7.10.1 indicate that this is significant.

Table 7.10.1: Chi Square Test Results – Use of Formal Methods for Managing Project Critical Success Factors by Organisation Factor

<i>Factor</i>	<i>Use of Explicit, Formal Method for Managing Project Critical Success Factor</i>		<i>Chi Square Value (Pearson) (n)</i>
	<i>Yes</i>	<i>No</i>	
Project-focused	20 (10.5)	9 (18.5)	*25.95 (61)
Not project-focused	2 (11.50)	30 (20.5)	

Critical chi-square value is 3.84 at the 5% level, so reject H_0 : There is no association between use of formal methods for managing project critical success factor and organisation factor and accept H_1 : There is an association

The results in Table 7.10.1. suggest the following hypothesis can be accepted:

Organisations with a strong project-focus use more formal methods to manage project critical success factors compared with organisations with no strong project-focus.

The formal methods can be broken down into 2 broad areas. The first area is the utilisation of some form of Project Risk Analysis and Management (PRAM), cited by 12 of the 22 subjects. All of the 12 subjects described similar processes, with an assessment/analysis of business and project risks leading to the formulation of a risk management action plan or risk log (with associated responsibilities). These subjects described how the PRAM process led to critical success/failure factors being defined and managed to ensure project success. A number of subjects made the point that the PRAM process does not just look at the potential problems and what might go wrong. It also considers the potential opportunities; a point that emphasises the fact that the likelihood of project success is not necessarily maximised by solely managing the critical failure factors (risks).

Whilst the PRAM processes described were fairly consistent, there was conflicting evidence as to their effectiveness, especially in the post-analysis stages of the process. A number of subjects indicated that the PRAM process often broke down during the risk monitoring/control phase. Typical comments included those of C.4, the Engineering Manager within the Aircrafts Business Team, who stated that "...there is a difference between noting it (a risk) and acting on it. Often it is a hope that somebody notices it". Also J.3, the New Product Introduction Manager, who described how risks were not effectively managed because "...senior management get sent minutes, for example to get commitment to a project, and they are not read."

The second area in relation to explicit formal methods for managing critical success/failure factors is the use of stakeholder analysis, leading to the establishment of the critical success/failure factors, cited by the remaining 9 subjects. In most cases "stakeholders" are limited to those internal to the organisation, with the participation of different parties to the project often being linked to the existing project structure. For example, subject M.2 (Assistant Chief Executive Officer in a metropolitan borough council) described a process

involving formal brainstorming sessions, with the participants being drawn into the sessions based on their position within a structure of steering committee, project board and project team. The requirements of a quality management system were also found to influence stakeholder participation, with 2 subjects describing how the involvement of the Quality Assurance department was required in developing a quality plan, which had critical success/failure factors defined.

There was little indication in the survey that the methods used to establish critical success factors through “stakeholder” participation involved any group external to a subject’s organisation (including the customer/client). The exception to this was the method used by subject R.2 (a project manager for infrastructure projects). R.2 described a process of “customer playback” after the project team had established the critical success factors; although it is perhaps significant that the “customers” in this case were internal to the organisation. The “playback” involved the customer carrying out the role of “devil’s advocate” in order to generate additional factors influencing potential success and failure. This playback continued throughout the project life cycle because, in the words of R.2, “...as the project progresses people become more aware of how things might affect them and they become more interested.” However, although the survey found wide evidence of methods for stakeholder analysis linked to the initial establishment of critical success/failure factors, there was much less indication that such stakeholder analysis continued throughout the project life cycle to ensure critical success/failure factors, once established, are effectively monitored and controlled.

The survey also found evidence of variations in the levels of utilisation of formal, explicit methods based on the “type” of project being undertaken (see section 7.5 Project Classification).

For example, N.1, a brand manager, described how formal brainstorming sessions took place depending upon the “importance” of the project in terms of its influence on the business’s future. This point was echoed by R.1 (Head of Project Management Focus Group) who stated that “...formal workshops are used to determine success factors for the success criteria, although it depends on the level of the project.” In addition to confirming

the dependency on the project classification for the adoption of formal methods, R.1 raised the issue of consistency. Commenting further, R.1 said: “The fact that we do it (use formal methods) or not is by no means consistent. It varies within my own group and across the whole organisation.” This lack of consistency was regarded as an issue by the other subjects describing the use of stakeholder analysis; though it seemed to be less of an issue for those using formal PRAM-based processes for managing success/failure criteria.

The second level of maturity is the use of implicit formal methods - mentioned by 6 (10%) of the 61 subjects. In these cases subjects stated that, whilst no specific methods were used to establish, document and manage critical success/failure factors, the factors influencing success and failure were adequately dealt with within the project environment. This approach was described by L.2 (Head of Computing and Information Services for a university): “It (the management of success/failure factors) is integrative within the overall project management process. There are no distinct methods, it is part of who does what, when, etc.” In terms of specific activities within the overall project management process, 3 of the 6 subjects stated that the “programme of events”, generated from the planning phase of the project, was the main way in which success/failure factors were initially established. They were then managed by the monitoring of cost/time/quality performance against the programme.

This reliance on the planned programme suggests possible limitations on the range of success/failure factors considered; with a likely emphasis on those associated with the characteristics of the project (such as the project’s size, value, uniqueness and complexity). However, the comments of the 3 subjects indicate that other types of success/failure factors are considered when generating the programme.

For example, subject D.1, the Head of Project Management within the Engineering Division, described how success/failure factors relating to the external environment were considered when establishing the plan for the construction of new manufacturing processing facilities. In particular, D.1 described how a factor influencing success is the need to get planning permission. The “risk” of planning permission being refused is reflected through the building in of activities, such as presentations and “lobbying” of the parties responsible

for such decisions, into the programme of events. Although this external environment factor is not dealt with in a structured way, in terms of being formally defined and managed, it is dealt with implicitly within the management of the project life cycle.

Seven (11% of) subjects stated that success/failure factors were dealt with intuitively, with no formal methods employed. These 7 subjects worked in organisations F (a training and consultancy company), L (a university), M (a metropolitan borough council) and U (an automotive manufacturer); none of which were classed as being traditionally project-focused. The approach described by the 7 subjects typically involved informal discussions about the factors influencing success. These discussions would not usually result in any formal documenting of success/failure factors (nor plans to deal with them). Furthermore, whether such discussions took place or not, in the absence of any formally defined processes, would be very much dependent on the individual managing the project.

The remaining 26 (43%) of the 61 subjects stated that there were no methods used, either formal or informal, to consider success/failure factors, in the project environment.

7.11 Project Management Processes/Procedures

Thirty one (53%) subjects worked in organisation environments that had a set of documented project management processes, compared to 23 (40% of) subjects who were in environments where no such processes/procedures existed. Two subjects did not know if such processes existed and 5 subjects did not answer.

Twenty one of the 31 subjects worked in organisations with a traditional focus on projects. In terms of the relationship between the formalising of project management processes/procedures and the characteristics of an organisation, the Chi Square test results in Table 7.11.1 indicate that the following hypothesis can be accepted:

Organisations with a strong project-focus formalise their project management processes/procedures more than do organisations with no strong project-focus.

Table 7.11.1: Chi Square Test Results – Use of Formal Methods for Managing Project Critical Success Factors by Organisation Factor

<i>Factor</i>	<i>Formal Project Management Processes/ Procedures in Existence</i>		<i>Chi Square Value (Pearson) (n)</i>
	<i>Yes</i>	<i>No</i>	
Project-focused	22 (16.1)	6 (11.9)	
Not project-focused	9 (14.9)	17 (11.1)	*10.65 (54)

Critical chi-square value is 3.84 at the 5% level, so reject H_0 : There is no association between use of formal methods for managing project critical success factor and organisation factor and accept H_1 : There is an association

The survey found some evidence of the influence of a quality management system in driving the development of a set of documented project management processes/procedures i.e. this was the case in over half of the cases (18 out of the 31 subjects). As described by D.1 (the Head of Project Management in the engineering division of a nuclear fuel reprocessing organisation); “A simple 2-page flowchart, with a more detailed code of practice and procedures” was typical of the way organisations had developed a documented system to meet the requirements of quality management systems standards (such as BS EN ISO 9000).

Table 7.11.2 provides an indication of the perceived usefulness of the documented project management processes/procedures. Of the 31 people managing projects under such conditions, 28 (90%) either strongly agreed or agreed that “formal processes/procedures are used, helping us to better manage our projects”. Four subjects (13%) either strongly agreed or agreed that “formal processes/procedures are used, but add little value”. Six subjects (19%) strongly agreed or agreed that formal processes/procedures were not used.

Table 7.11.2: Usefulness of Project Management Processes/Procedures (Total = 31)

<i>Statement</i>	<i>Strongly Agree</i>	<i>Agree</i>	<i>Neutral</i>	<i>Disagree</i>	<i>Strongly Disagree</i>	<i>Don't Know</i>
Formal processes/procedures are used, helping us to better manage our projects	15	13	1	0	2	0
Formal processes/procedures are used but add little value	2	2	5	13	9	0
Formal processes/procedures are not used	2	4	3	10	12	0

(Frequency distributions are in Appendix 7.3.)

Of the 6 subjects agreeing that “formal processes are not used”, 5 of these subjects also strongly agreed or agreed that “formal processes/procedures are used, helping us to better manage our projects”. In addition, only 1 of these five subjects agreed that “formal processes/ procedures are used but add little value”. This suggests that, in many organisation environments, project management processes/procedures are adhered to in some situations, and not in others. Such a contingent approach is not perceived to have a detrimental effect on the value of the processes/procedures.

The results show that 7 subjects who strongly agreed/agreed that “formal processes/ procedures are used, helping us to better manage our projects” also strongly agreed/ agreed that “formal processes/procedures are used but add little value”. This suggests that, in these situations, the lack of adherence to procedures is more likely to be by accident than by design, with, perhaps, more negative consequences in terms of the effectiveness of managing projects.

The survey found only 2 subjects consistently “negative” towards their documented project management system (across all three questions shown in Table 7.11.2).

Subject H.2 worked as a programme manager for an organisation supplying electronic components to the automotive industry. To meet the requirements of the major car manufacturers, the electronic component supplier needed to ensure they adhered to the requirements of the QS 9000 standard for a quality management system. The complaints of H.2, that the processes/procedures were used but added little value, focused more on the problems of operating to the QS 9000 standard than the inherent nature of the project management system.

Subject F.1 was the managing director of a small training and consultancy firm that had attempted to introduce a set of project management processes and procedures as an integral part of a documented quality management system (meeting the requirements of the BS EN ISO 9000 standard). F.1’s comments that the processes/procedures were helpful but not

used reflected the fact that the initiative was on-going but meeting with some resistance from staff. This fact was confirmed by the other 4 subjects from organisation F included in the survey, who all stated that no set of documented processes/procedures existed in the organisation at that time.

The number of mandatory project management processes/procedures in existence is shown in Table 7.11.3.

Table 7.11.3: Number of Mandatory Project Management Processes/Procedures (Total = 31)

<i>None</i>	<i>1 to 10</i>	<i>11 to 30</i>	<i>31 or above</i>	<i>Don't Know</i>
2	13	4	7	5

Comments by subjects, confirmed by the slightly bi-modal frequency distribution, suggests two broad strategies for the development of such processes/procedures.

The first strategy is to make the overall project management process, which guides the whole of the life cycle, mandatory. Most of the individual procedures within the overall process being used at the project manager's discretion. Subjects following this strategy stated that "1 to 10" formal project management processes/procedures were mandatory (13 subjects in Table 7.11.3).

Typical of this strategy was organisation C, an aerospace and defence manufacturer. Organisation C made the the overall project management process which guides the whole of the life cycle mandatory, but focused on "issues", rather than procedures, within that cycle. In terms of the mandatory elements of the system, the focus is on the questions why and what rather than how? For example, C.4 stated that, "... (a project manager) might not have to use a format, but might have to address an issue. The "policy" would be mandatory, calculate "earned value", but you decide how to do it." A similar approach is described by A.1, Communication Services Manager in a banking and financial services organisation: "It's in the process of changing now. The Chief Executive Officer last month issued a directive to everybody saying you must "do" risk assessment on all projects."

The second strategy is to make both the overall project management process and many of the individual procedures mandatory. Subjects following this approach stated that “31 or above” procedures existed in the organisation (7 subjects). However, care needs taking in interpreting these results as it was evident that in some organisations the procedures related to the technical requirements of the work, i.e construction and IT, rather than exclusively to project management activities.

The survey found no evidence that one approach or the other was more likely to be perceived as being helpful to the management of projects. All 7 subjects using “31 or above” mandatory processes/procedures either strongly agreed or agreed that the processes/procedures were used, helping them to better manage their projects. Similarly, 10 of the 13 subjects who stated that the number of mandatory processes/procedures was “1-10” also strongly agreed/agreed that formal processes/ procedures were used, helping them to better manage their projects.

However, the survey shows that subjects working in environments with 30 or more mandatory procedures wished to see a reduction in the number of both technical and project management procedures. A number of subjects were working on initiatives to this effect. Subject C.1 (the Head of Project Management in the Systems and Services Group) stated that they were looking to “rationalise and reduce” documented processes and procedures. Likewise, Subject D.2 (a project manager in the Project Procurement Group of a nuclear fuel reprocessor) described a current project to cut down on the 700 procedures in existence in the organisation.

There was also some evidence that problems existed if project management processes/procedures were perceived as placing an unnecessary restriction and control on an individual’s freedom to manage a project. This was the case in organisation A (a supplier of banking and other financial services), where A.5, a business consultant in Group Strategic Planning and Consultancy, stated that there was “...a general feeling in my part of the organisation that they are bureaucratic and they are applied rigidly to all projects.” This point is echoed by A.1:

“(One part of the organisation) has a very well developed set of processes and procedures. The organisation as a whole feel that they are perhaps too burdensome and bureaucratic. So they haven’t been fully rolled out across the whole group. However, we’ve now come round to recognise that we do need those things in place because certain projects haven’t gone as well as they might have if certain controls had been in place. So we are now trying to find a compromise between “the red file type environment” and “the happy-go-lucky, hit-and-miss.”

The issue of control, through the use of mandatory processes/procedures, was echoed in other organisations. Subject C.4 (Engineering Manager in Aircraft Business Team), describing the project in organisation C to look at improving their documented processes and procedures, commented: “Part of what we are doing is deciding what is mandatory and what is not mandatory. What “not mandatory” means and what freedom exists.”

Table 7.11.4. shows the areas in which the documented project management processes and procedures apply.

Table 7.11.4: Activities Covered by Documented Processes/Procedures (Subjects may select more than one) (n = 31)

<i>Activity</i>	<i>f</i>	<i>%</i>
a. Planning time, cost, scope of work	26	89.7
b. Defining benefits, goals, objectives	25	86.2
c. Monitoring, controlling a project	24	82.8
d. Conception, initiation of a project idea	23	79.0
e. Project start-up	23	79.0
f. Contract management	23	79.3
g. Managing risk	21	72.4
h. Closing down a project	21	72.4
i. Performance review	21	72.4
j. Handover of project deliverables	20	71.4
k. Change management	18	62.1
l. Project selection, prioritisation	17	58.6
m. Configuration management	13	46.4
m. Quality management	11	37.9
o. Benefit management	9	31.0
p. People selection	7	24.1

The table shows a coverage of 50% or more for the areas A – L. The areas less commonly included in documented processes and procedures are: configuration management, quality management, benefit management and people selection.

Twenty six (84%) of the 31 subjects stated that the documented project management processes and procedures could be amended. The situations in which amendments took place are shown in Table 7.11.5.

Table 7.11.5: Situations in which Project Management Processes/Procedures are amended (Subjects may select more than one situation (n = 26))

<i>Situation</i>	<i>f</i>	<i>%</i>
As part of ongoing, continuous improvement programmes	20	74.1
During an individual project at the discretion of one of the parties	11	40.7
As a formal activity based on the experience of past projects	9	33.3
Other	2	8.3

The most common situation in which amendments took place was “as part of ongoing, continuous improvement programmes”. This was described by 20 (74%) of the 26 subjects.

Eleven subjects stated project management processes and procedures could be amended “during an individual project at the discretion of one of the project parties”. Amendments tended to be carried out during specialist activities linked to the management of projects. For example, procedures for obtaining budgetary approval or procedures for signing off project deliverables might be changed during a project. Such amendments, without exception, were carried out by the project manager in consultation/agreement with a “sponsor”, “quality assurance” representative or “phase review” chairman.

Nine subjects stated that amendments were carried out “as a formal activity based on the experiences of past projects”. They were located in the following organisations:

- A – a supplier of banking and other financial services,
- C – an aerospace/defence manufacturer,
- D – a nuclear fuel reprocessor,
- H- a manufacturer of electronic components for automobiles ,
- J – a telecommunication producer,
- L – a university
- M – a metropolitan borough council.

As was the case with the existence of documented process and procedures, the influence of a quality management system was evident in terms of carrying out such an activity. For example, 6 of the 9 subjects stated that a review of procedures was built into the operation

of a quality management system adhering to either the BS EN ISO 9000 or QS9000 standards

Two subjects mentioned other situations in which processes/procedures were amended. D.2, stated how they would be changed in response to legislation and R.1, the manager of the Project Management Focus Group, described how functional groups responsible for some part of the administration of projects, such as the setting up of cost codes and the allocating of capital, would change processes and procedures.

7.12 Project Management Software

Thirty nine (70%) of 56 subjects agreed that a computer-based software package was used to support the management of projects. Sixteen (29%) worked in organisations that did not use such a package, 1 subject did not know and 7 subjects did not answer.

The existence of such packages were more concentrated in the traditional project-focused organisations than organisations with no strong history of managing projects. Of the 25 subjects working in traditionally project-focused organisations 24 stated that a software package was used. In terms of the relationship between the automation of the project management information system and the characteristics of an organisation, the result of the Chi Square test show that the following hypothesis can be accepted:

Organisations with a strong project-focus automate their project management information system more than do organisations with no strong project-focus.

Table 7.12.1: Chi Square Test Results – Use of a Computer-based Software Package by Organisation Factor

<i>Factor</i>	<i>Use of a Computer-Based Software Package</i>		<i>Chi Square Value (Pearson) (n)</i>
	<i>Yes</i>	<i>No</i>	
Project-focused	24 (17.7)	1 (7.3)	*13.98 (55)
Not project-focused	15 (4.3)	15 (8.7)	

*Critical chi-square value is 3.84 at the 5% level, so reject H_0 : There is no association between use of automated project management information system and organisation factor and accept H_1 : There is an association

Table 7.12.2 shows the type of computerised project management systems currently used (in many cases subjects may have more than one type of system in their organisation). The level of utilisation of the 4 different “types” of system reflects changes in technology. The high frequencies of “stand-alone, PC-based with features for planning, monitoring, controlling and reporting” (24 subjects : 62%) and “networked system integrated with other software packages such as spreadsheets and databases” (21:54%) contrasts with the relatively low frequency of “a centralised mini/mainframe system” (4 subjects:10%).

Table 7.12.2: Types of Computerised Project Management Systems Used (Subjects may select more than one type of system (n = 39))

<i>Type of System Used</i>	<i>f</i>	<i>%</i>
Standalone, PC-based, with features for planning, monitoring, controlling and reporting	24	61.5
Networked system integrated with other software packages, such as spreadsheets and databses	21	53.8
Standalone, PC-based system with risk/what if/perfroamcne analysis features in addition to those for planning, monitoring, controlling and networking	6	15.4
A centralised, mini/mainframe system	4	10.3

The survey found little evidence of a widespread use of a “stand-alone, PC-based system with risk/what if/performance analysis features in addition to those for planning, monitoring controlling and networking” (6:15%). It is possible that some of the subjects using networked or centralised systems had access to some of these additional features.

Of those 39 subjects who use some sort of computer-based software package used to support the management of projects, 19 (49 % of) subjects stated that they would like to see the system “upgraded” in some way in the future. Nineteen subjects did not have any plans, or wish, to upgrade and one subject did not know.

The responses of these 19 subjects planning or seeking an upgrade of their software package indicates a number of issues of concern, namely:

standardisation, user-friendliness, flexibility, integration, availability and functionality

(with, in some cases, subjects mentioning more than one issue).

The need for standardisation on a single organisation-wide project planning software package, such as Microsoft Project, PMW or Artemis, was expressed by 6 subjects, with a general consensus that standardisation on a networked version of a suitable package was desirable. Such standardisation was seen as necessary to meet the organisation's need for cross-functional project work, as "...we will be better able to move people from project to project" (subject D.4 – Head of Engineering Management Development). In addition, 2 subjects highlighted the desirability of having a standard automated tool that would, according to A.3 (Client Services Manager), provide "...a consistent template for managing projects, which all people would use and change to suit their project."

The survey found that 2 organisations, D and J (a manufacturer of telecommunications products), had recognised this issue and taken steps to address it. In both cases they had decided to use one, centralised project management planning tool. However, this decision was causing problems. In organisation D, subject D.2, a project manager, stated that the organisation was "...not being successful at centralising. Talk about "best practice" does not help. Everybody is willing to change as long as change is to the way they want." These sentiments were echoed in organisation J, with subject J.5, the Software Projects Manager, believing that the organisation needed to "...move backwards" from a recent decision to centralise on one system. Further comments show a potential conflict between specialist project planners and other staff working on projects. This is articulated by J.5: "There has been a central decision to move to a common system (Microsoft Project to Artemis) because the planners like it."

The concerns of D.2 and J.5 about the problems of standardisation also raise the issues of "user-friendliness" and "flexibility". One of their main complaints was that the chosen system was not easy to use (this issue was also identified by 1 other subject). Flexibility was mentioned by 2 subjects; in the words of J.4 (a project manager in the same department as J.5): "We need a system that will be simple to use for the smaller projects."

The need to integrate various systems was mentioned by 3 subjects, with a particular requirement being the importance of linking project planning systems to systems for costing and time management.

Linked to the issue of integration is the question of availability (mentioned by 5 subjects). The growth of standalone PC-based packages means, in some cases, the facilities of the systems and the project information held in the various systems is not widely available across the organisations. Just as in the case of standardisation, discussed above, increasing availability is seen as necessary to meet the organisation's needs for multi-functional teamwork. The problems of lack of availability of functionality and of information are, in some organisations, being addressed by the networking of project management software packages (which have the functionality) and the use of packages such as Lotus Notes (which have the facility for sharing information between users).

The results of the survey suggest that the subjects who see availability as a problem, view further investment in the Information Technology (IT) infrastructure as the main solution (although addressing such issues as "changing the organisation culture", "raising awareness" and "training" were raised, in addition to the need for investment). Significant benefits from such investments were anticipated. For example T.2, responsible for projects to develop new products in sports footwear and sports equipment, believed that investment in IT would "...help communication, innovation and creativity."

The final issue of concern is functionality. Two subjects highlighted the desirability of having a standard automated tool in the areas of process management. One other subject also stated that increased functionality in this area was desirable. N.1, a product manager responsible for the production of fabric conditioners and washing liquids, stated that the organisation, which already had automated processes for brainstorming and setting up a team, was "...looking at an automated process for generating capital projects."

7.13 Benchmarking of Project Management

Eleven (21%) of 53 subjects benchmarked their project management processes. Forty two (79%) subjects did not benchmark project management processes and 5 did not know.

Nine of the 11 subjects who benchmarked their project management processes worked in organisations with a traditional focus on projects. In terms of the relationship between the

benchmarking of project management and the characteristics of an organisation, the Chi Square test results in Table 7.13.1, indicate that the following hypothesis can be accepted:

Organisations with a strong project-focus benchmark project management more than do organisations with no strong project-focus.

Table 7.13.1: Chi Square Test Results – Benchmarking of Project Management by Organisation Factor

<i>Factor</i>	<i>Benchmarking of Project Management</i>		<i>Chi Square Value (Pearson) (n)</i>
	<i>Yes</i>	<i>No</i>	
Project-focused	9 (5.2)	16 (19.8)	*6.69 (53)
Not project-focused	2 (5.8)	26 (22.20)	

*Critical chi-square value is 3.84 at the 5% level, so reject H_0 : There is no association between benchmarking of project management and organisation factor and accept H_1 : There is an association

The survey indicates 2 main drivers of the benchmarking activities described by the 9 subjects.

One driver was the existence of national project management standards for “best practice”. Subjects C.1 (Head of Project Management in Systems and Services), C.4 (Engineering Manager for Aircraft Business Team) and D.1 (Head of Project Management in Engineering Division) stated that involvement in the APM Benchmarking Special Interest Group (SIG) was providing an impetus for benchmarking. Furthermore, written standards and best practice, for example BS6079 Guide to Project Management (BSI 1994a) were being used to measure their project management processes against best practice.

A second driver was an interest and focus on organisational processes. All 9 subjects emphasised that their organisations were very interested in processes; with stating that project management processes were benchmarked as part of wider organisational process improvement exercises.

The results highlight the distinction between the benchmarking of project management processes and the benchmarking of the management of individual projects (usually against cost/quality/time criteria). Five subjects stated that benchmarking in the project environment was carried out, but that it was more focused on how completed projects performed against a standard (either internal or external to the organisation). For example, H.4 (Senior Manufacturing Manager for an automotive electrical component manufacturer) described how Global Electronic Manufacturing (GEM) standards, based on visiting other organisations, were used to measure the performance of projects. Likewise, A.1 (Communication Services Manager in an organisation supplying banking and other financial services) stated how software development projects were measured against industry norms. By contrast, J.2 (Head of Business Engineering for a telecommunications manufacturer) described how the organisation's project performance was benchmarked "...informally against other departments - against time-to-market, which is currently in vogue."

Within those organisations that have some experience of benchmarking, the survey found some indication of a difference of opinion as to the benefits of carrying out such benchmarking activities (especially benchmarking individual project performance). Subjects C.1, C.3 (a senior project engineer), C.4 and D.1 were uniformly positive in their attitudes towards the desirability and usefulness of having benchmarking of processes. The benefits included process improvement leading to enhanced performance, "public relations", "image" and as "a communication tool to management". However, each of these 4 subjects described how their organisations were in the relatively early stages of developing their benchmarking activities. By way of contrast, subject D.3, Head of the Project Procurement Group (and previously Head of Engineering and Projects Director), had been involved in benchmarking as the past chairman of a cross-company benchmarking association. D.3 was highly sceptical of the usefulness of benchmarking project performance, stating:

"We carried out benchmarking but I'm doubtful as to its validity. How do you compare? How do we measure success? How do you treat capital and revenue? For example, (Company) claimed they had never gone over budget or over time, but this was based on last month's revised estimates."

7.14 Concluding Remarks

The results presented in this chapter, relating to the testing of the research hypotheses, suggest a number of broad conclusions. These conclusions, and the other results in this

chapter, are used, in Chapter 8.4, to discuss the research questions relating to the topic of project management systems.

In terms of project management systems, project-focused organisations are distinguishable from other organisations in the following ways:

- They make more use of a model of the project life cycle
- They use more formal methods to manage the project success criteria perceived as important
- They use more formal methods to manage the project critical success factors perceived as relevant
- They are more likely to formalise their project management processes/procedures
- They are more likely to automate their project management information system
- They are more likely to benchmark project management.

The outcomes from the statistical tests show that the characteristics of the organisation, in terms of degree of project-focus, manufacturer or service provider, and private or public sector, does not have a significant influence on the levels of importance attached to project success criteria, relative to other project success criteria. In addition, whether a subject is involved at a strategic/multi-project level, or directly involved in projects day-to-day, or involved in the development of project management process/procedures, does not have a significant influence on the levels of importance attached to project success criteria, relative to other project success criteria.

In terms of the relative importance attached to individual project success criteria, the tests show that a subject's involvement in projects is only significant in influencing perspectives of a small number of success criteria. Specifically, subjects with a direct day-to-day involvement in projects, as a project or programme manager, attach more importance to their own personal growth, as a measure of project success, than do subjects with no such involvement. Also, subjects whose main project experience is on projects with "hard" elements attach more importance to measuring success by the level of adherence to defined procedures than do subjects who mainly work on projects with "soft" elements.

The statistical test results show that the characteristics of the organisation, in terms of degree of project-focus, manufacturer or service provider, and private or public sector, does not have a significant influence on perceptions of the relevance of project critical success factors, relative to other project critical success factors. Whether a subject is involved at a

strategic/multi-project level, or directly involved in projects day-to-day, or involved in the development of project management process/procedures, also does not have a significant influence on perceptions of the relevance of project critical success factors, relative to other project critical success factors.

CHAPTER 8

DISCUSSION OF RESULTS

8.1 Introduction

The previous three chapters presented the survey results in terms of the uses of project management, the nature of project management related structures, and the nature of project management related systems. In the first three sections of this chapter the survey results are discussed, in each of these three areas, in the context of addressing the research questions developed in the Statement of the Problem at the end of Chapter 2. In addition, by linking the survey results to the literature reviewed in Chapter 2, specific findings are used to draw inferences to project management theory.

The previous three chapters also presented the outcome of the statistical tests of the research hypotheses relating to the potential influence of various organisation related and work related factors, on project management uses, structures and systems. The chapter also provides an overview of the significant findings of the study in relation to these influences.

The chapter concludes with a critique of the study and recommendations for future research.

8.2 Use of Project Management

8.2.1 Development of Project Management

The survey results suggest that an increase in the “use” of project management, described in academic colloquies and personal reflections, is not necessarily reflected in a uniform increase in the use of project management teams, the role of projects as a strategic tool and the use of project management methods. Sixty nine percent of subjects had witnessed an increase in project team structures, but only 45% of subjects had seen an increase in the role of projects as a strategic tool, and only 40% had seen an increase in the use of project management methods. These results tend to confirm the implicit assumption of writers, such as Kerzner (1994) and Cleland (1994), that there has been an increase in the “use” of project management, in all types of organisation, and that this change has been reflected in an increase in project team working. However, the development of project team working has not always accompanied by an increased strategic role for projects and an increased use

of project management methods, tools and techniques. This suggests that other assumptions made by writers, for example that more project team working is accompanied by more use of project management methods, are not necessarily valid.

Another interpretation of the results is that the use of project management methods is long standing and well established and the greater changes witnessed by subjects, in terms of the use of project team structures, is part of a catching up process. Responses from subjects in other parts of the survey suggest that this alternative interpretation is not a likely explanation.

In terms of the factors influencing developments in the use of project management, the results highlight the pre-eminence of three, possibly inter-linked, factors. These factors are more demanding customers, a new business strategy and increased competition, which were identified in the survey, by 34%, 17% and 15% of subjects respectively, as the three most commonly cited single factors. A common thread joining these factors together is their focus on the external environment. From these results one can conclude that the underlying driver of the increase use of project management principles is the need to survive and prosper in ever-changing external environments. This lends weight to the theory, stated by Kerzner (1994), that the more an organisation recognises the need to develop ways of dealing with the “threats” from outside the more likely it is that project management will be utilised more fully.

The importance of external factors in influencing the development of project management suggests that comparisons between the disciplines of project management and quality management may be justified. Both disciplines are driven by an organisation’s need to survive and prosper in changing environments and, in response to this need, both have as part of their philosophy an emphasis on the meeting of customer requirements.

Whereas the project management literature focuses mainly on external factors in terms of the drivers for change in relation to the use of project management, the survey results also highlight the importance of internal factors, such as new management and changes in technology leading to new working practices. These findings are consistent with the results of the study by Lascelles and Dale (1993) into the drivers of change relating to the

introduction of quality management. This provides further evidence of the validity of drawing comparisons between the disciplines of quality management and project management and highlights the potential for cross-fertilisation of theories and concepts between the two disciplines. Therefore, in terms of project management theory, the results confirm the prominence already given to external influences on the development of project management, but they also suggest the need for some recognition of the importance of internal influences.

8.2.2 Importance and Scope of Project Management

With only one of the subjects surveyed stating that projects were not, to a lesser or greater degree, important to their organisation, the survey results suggest that projects are becoming increasingly important to all types of organisations. This confirms a general trend, described by Firth (1995), of a new focus on project work in organisations with no history of managing projects. However, the assumption of homogeneity in terms of the importance of project management is not always a valid one, as there may be differences between different parts of an organisation and, in some cases, the importance of project management to an organisation, may even reduce over a particular time period. However, building upon the work of Firth (1995), the general trend leads to the conclusion that more and more organisations will look to utilise project management principles as a way of dealing with this increase in project focus.

The survey found some evidence that the increased importance attached to projects has been accompanied by a recognition that projects are an appropriate vehicle for managing all types of business-led change. For example, 63% of subjects agreed that a project was a vehicle for tackling all business-led change, rather than being used exclusively for the management of major, one-off, capital-intensive activities. These results are consistent with the work of Fangel (1994), Lane (1993) and others who suggest that contemporary project management is broader in its area of application than traditional project management. This widespread perception that projects are the way to manage many different types of work suggests that organisations will be looking to develop organisational approaches to ensure consistent project management principles are used.

8.2.3 Features of a Project Environment

In terms of the specific features of a project environment, described by writers such as Firth & Krut (1991) and McElroy (1995), the survey results suggest that some features are more common than other features. Confirming descriptions in the literature, the following features are often found in project environments:

Project ideas/information is freely shared by all,
Project-focused meetings are held in the organisation,
Open two-way partnerships with customers exist,
Open two-way partnerships with suppliers exist.

The presence of these features suggests that many project environments are characterised by partnerships and by a sharing of information. The existence of open two-way partnerships with both customers and suppliers supports the importance placed on the development of such partnerships by case studies in the literature, such as Levasseur (1993) and Dubinskas (1993). The survey results show a distinction between internal and external customers and internal and external suppliers. Subjects who identified problems in establishing partnerships were often dealing with customers or suppliers in other parts of the organisation. In terms of barriers to the effective utilisation of project management, this suggests that, in addition to the difficulties linked to clashes of cultures between different organisations, highlighted by Dubinskas, the ability to establish partnerships may be hindered by the existence of different cultures within the same organisation.

The survey results provide less confirmatory evidence that the following features, also described in the literature, are widely present in project environments.

Social gatherings and festivities associated with projects are held in the organisation,
A common project “language” is shared by all,
Project teams are usually brought together to work in close physical proximity to each other,
Project information is clearly evident in the work environment (e.g. charts/pictures).

The absence of some of these features may be important in terms of steps to increase the use of project management within organisations. For example, Kerzner (1994) highlighted the importance of a common project language in facilitating “company-wide understanding of, and interfacing to” project management. The absence of such a feature may explain why some organisations have problems in introducing project management across an organisation. The survey results suggest that the ability of an organisation to establish a

common project language can be influenced by organisational change. For example, an organisation with a well-developed and widely used common project language found, on its merger with another organisation, that no such language existed in the newly formed company. In terms of solutions to the problem of an absence of a common language, some of the survey findings in relation to the establishment of project management systems are pertinent. One benefit of using a model of the project life cycle, highlighted by 26% of the 46 subjects using such a model, was its contribution to effective communication between project stakeholders. A number of subjects described this communication in terms of developing a common project language. This suggests that developing and using a model of the project life cycle may be helpful in facilitating the company-wide understanding of, and interfacing to project management, described by Kerzner.

There are also indications from the survey that the existence of certain features may be dependent upon the existence of other features. For example, some subjects who believed there were difficulties in establishing a common project language also highlighted the lack of partnerships with other departments as an issue. Therefore, just as Nicholas (1989) concluded that project critical success factors are not independent, it can be argued that features of a project environment show a similar dependency.

8.2.4 Usefulness of Project Management

Analysis of the specific uses of project management suggests that current utilisation of project management may be categorised as one of four classes:

- Class One - currently core and well-established, applied and useful in most project environments
- Class Two - currently secondary and less well-established, though applied and useful in many project environments
- Class Three - currently marginal and not established, applied and useful in few project environments
- Class Four - not useful.

The survey results indicate that the areas regarded as most useful (Class One use), such as better co-ordinating and prioritising of work or better meeting time, cost and quality objectives, tend to be those traditionally associated with project work. Kreiner (1992), Doujer & Haslauer (1991) and Roome (1994), theorise that project management needs to be viewed in the context of contributing to innovation and creativity. However, the fact that these activities are classed as least useful (Class Three/Four), suggests that current practice

does not reflect the importance attached to such activities in the literature sources.

Therefore, one can conclude that, whilst there has been changes in broad perceptions as to the applicability of project management in the work environment, in practice, the specific uses of project management are still very much focused on areas associated with traditional project management. This is not to say that the theoretical importance attached to using project management in new areas, such as facilitating innovation and creativity, is misplaced. For example, comments by subjects working in innovative and creative environments, suggest that the need to link project management with innovation and creativity is recognised, but, at this time, is regarded as being difficult to achieve. A manager responsible for developing new products for one of the top three global sportswear manufacturers articulated such concerns:

“... (The market leader) have moved towards a project culture. We try and do a project management approach, but the organisation is arranged in a non-project fashion. We need to focus towards research and innovation, with a change in the organisation and structure.”

The problem, then, is not necessarily a failure to recognise the potential of project management, in terms of new uses, but rather a recognition of the practical difficulties associated with establishing the structures and systems required to make full use of its potential.

8.2.5 Benefits Anticipated from using Project Management

The benefits that are anticipated from using project management, reported in the survey, confirm the importance attached to external drivers, by such writers as Kerzner (1994), discussed in Section 8.2.1. Greatest benefit is anticipated in terms of being better able to meet customer requirements and helping the business survive. These results are consistent with the work of Cleland (1991) and Turner (1991), which emphasise benefits in these two areas. The results also provide further evidence of the similarities between the disciplines of project management and quality management. Again, the results show that project management, like quality management, is driven by an organisation's need to survive and prosper in changing environments and, in response, it focuses on the meeting of customer requirements.

A further similarity between the two disciplines is evident in the different perspectives of anticipated benefits. Just as Lascelles and Dale (1993) identified external-oriented and internal-oriented drivers of the use of quality management, so the survey highlights anticipated benefits of project management from both an external and an internal perspective.

In terms of benefits with a more internal-oriented perspective, a number of conclusions can be drawn. Firstly, there is confirmation that some such benefits claimed in the literature, for example, increasing productivity through better utilisation of limited resources and increasing employee responsibility for work carried out (Kerzner 1994), are anticipated in practice. However, secondly, there is an indication that other claimed benefits, such as breaking down barriers to the introduction of change (Dawson 1994), are not anticipated. These results suggest that care needs taking in terms of selling the potential benefits of project management. Some benefits may already be anticipated and might not need a great deal of selling in an organisation. Others might not be anticipated and, if applicable to a particular situation, might need extensive selling.

The review of the literature highlighted the difficulty of gauging the reliability and validity of claims, made by authors such as Beattie (1995) and Kemp et al (1993), relating to the benefits of using project management. Specifically, in critiquing these literature sources, it was suggested that such claims might be simultaneously attributable to a variety of initiatives undertaken in an organisation. The survey results of the changes witnessed by subjects during their time in the organisation, reported in Chapter 4.5, confirm the existence of such a variety of initiatives. Over 50% of 62 subjects had experienced twelve different types of change programme during their time in the organisation, which in most cases is at least five years. These initiatives included re-defining of jobs, a project approach to work, quality management system accreditation, a reduction in management layers and the introduction of TQM. All these initiatives, to varying degrees, were perceived as having had a positive effect, and hence delivering benefit, to the organisation. In a situation where so much different types of change has taken place it is difficult to justifiably attribute any particular benefit, from an organisation perspective, to any one initiative.

8.2.6 Obstacles to the Use of Project Management

The previous section discussed the survey results, in relation to the anticipated benefits of project management, in the context of selling the use of project management to staff in an organisation. Another important part of the process of having project management accepted and used is overcoming any obstacles that may exist in the organisation.

The survey results confirm the view, expressed by Stokes (1995) and Firth & Krut (1991), that increasing the use of project management in organisations may involve major cultural and structural changes. Therefore, a set of obstacles to the use of project management relates to the perceived consequences of any major change programme, whether it be TQM, business process re-engineering or project management. In this respect the survey results suggest that the phenomenon of “change fatigue”, which is evident in all types of organisation, but particularly those in the public sector, might be influential. Such fatigue, caused by the large number of change initiatives undertaken in recent years, might lead to any new initiative, regardless of its potential merit, being viewed with some suspicion and hostility. In addition, any bad experiences of previous change programmes are likely to create an obstacle to any further changes, including the use of project management.

There are indications that some anticipated obstacles to the use of project management reflect perceptions of the nature of project management. As stated in the presentation of the survey results, obstacles in this area were identified by 25 (40%) of the subjects surveyed

The first potential obstacle relating to the perceptions of the nature of project management is the perceived applicability of project management. Writers on the subject, such as Fangel (1993), state that project management is used by contemporary organisations in work areas not traditionally regarded as applicable for using project management methods. The results of the survey suggest that a failure to recognise this broader view of the potential of project management would be an obstacle to its use. This would be a particular issue for organisations with no tradition of managing projects, or in situations where subjects regarded projects as only being an appropriate vehicle for managing major, capital-intensive, one-off activities in areas such as construction and defence.

Furthermore, in some cases project management might be viewed as applicable for the management of new types of work but, in terms of priorities, project management focus is concentrated in traditional work areas. This was the case in a fuel reprocessing company, in which project resources, such as experienced project managers, were targeted at the capital-intensive “hard” projects. This was despite that fact that the need to better manage soft projects, such as the introduction of a new human resource system, was recognised, but not addressed. One can conclude, then, that even in organisations where the wider use of project management principles is regarded as desirable, there are practical difficulties to any increase in usage in new areas of work.

The second potential obstacle relating to the perceptions of the nature of project management is perceptions of the characteristics of project management. In a number of situations the perception of project management might need to be changed. In organisations with no history of using project management this might primarily focus on raising awareness as to the usefulness of project management though, perhaps, with a focus on its proactive uses in such areas as facilitating creativity and innovation. In some organisations it may require changing perceptions. For example, the survey showed a number of situations (10% of subjects) where project management was regarded as bureaucratic and unlikely to provide the organisation with any benefit. In response to this, organisations will need to consider, through education and training, how best to improve awareness of the benefits of using project management.

The survey also found possible problems in instances where project management was perceived as imposing some degree of central control and a focus on team working. This was evident in organisations, such as a university, with a culture emphasising “individual freedom”. This leads to the suggestion that, in some environments, such as those where the emphasis is on an individual’s professionalism, the use of project management principles would be seen as reducing an individual’s ability to carry out their role in the best manner they saw fit. Organisations will need to develop strategies to change this perception.

A final area of obstacles, perhaps unique to the area of project management, relates to the nature of existing project environments. Subjects in project-focused organisations identified hostility to change amongst the existing project management community as a potential

obstacle, with project groups anxious to protect their environments, whether they are individual projects or groups of projects. This potential hostility suggests that, in order to reflect current attitudes and behaviour, a model of project environments needs to incorporate elements of the “empires of interest”, as defined by Kreiner (1992), as well as the “theatre of passions”. Therefore, strategies need developing that both recognise and overcome the self-interest of project groups, which, as well as having a positive focus on achieving the objectives of projects, may also have a potentially negative consequence in terms of protecting their own role.

8.3 Project Structures

8.3.1 Structures for Managing a Project

The survey results confirm the widespread use of matrix structures, as described by Galbraith (1971) and Larson & Gobeli (1989), with differences in such structures identifiable by the relative power and authority of the project managers and the functional managers supplying resources to projects. The survey also confirms the existence of hybrid structures, described in cases, such as Ford (1993), that combine elements of a dedicated project team with features of a matrix.

The characteristics of these hybrid structures are not inconsistent with the concept of the networked organisation, described by writers such as Ives et al (1993), although there was no strong evidence in the survey that some of the features equated with a networked organisation were widely present in project organisations. For example, theorists, such as Ives et al (1993) and Firth & Krut (1991), highlight the flexible nature of networked structures. Yet the survey results suggest that the structures adopted by organisations, even where such structures have involved the breaking down of vertically oriented and functional-based structures into flatter structures, are not perceived as being particularly flexible.

The literature highlights the crucial role of “strategic brokers” to the effective operation of project structures. The survey results suggest that such brokers may exist. For example, in the matrix and hybrid structures found in existence, key senior managers, often with responsibility for project management across the whole of the organisation, could be seen as acting as brokers. However, rather than being at the centre of a web, managing ideas and

co-ordinating the activities of others, as described by Ives et al (1993), these brokers seemed to occupy a position between the project groups and the functions supplying resources to the projects. In such a position, they are responsible for taking a strategic view of projects, rather than a more local, project-specific view and they are also responsible for the development of project management methods and project staff across the organisation.

There is evidence of a general agreement that some of the claimed benefits in the literature relating to the creation of project-focused structures, such as the effective operation of multi-functional teamwork and the creation of a strong customer focus (Firth & Krut 1991) are perceived as being realised in practice. However, there is also evidence that some claims are not perceived as being valid. For example, as mentioned previously, the claim of increased flexibility is not universally confirmed. Nor is there any evidence that current project structures, which emphasise horizontal integration, are universally perceived as making the organisation any more creative or innovative. This suggests that being more innovative and creative, which in the opinion of writers on the subject, such as Kreiner (1992), is driving organisations to adopt new project-oriented structures, is not currently regarded as an outcome of adopting the structures in existence.

8.3.2 Structures for the Strategic Co-ordination of Multi-Projects and for the Centralised Support of Project Management Activities

The survey results confirm the findings of the previous study by Chaffey (1997) relating to the existence of structures for the strategic co-ordination of multi-projects and for the centralised support of project management activities. Chaffey stated that less than 60% of organisations believed they had adequate structures to *manage portfolios* of projects. By comparison, the survey found that only 42% of subjects worked in organisations that had structures for the strategic co-ordination of multi-projects and only 34% of subjects worked in organisations that had structures for the centralised support of project management activities. Therefore, whilst writers, such as Ives et al (1993), highlight the need for activities both for the co-ordination, centralised control and assessment of the work of independent groups and for the control of the work between groups, the survey highlights a widespread absence of structures to support such activities.

In terms of the specific functions of structures for the centralised support of projects, the most common could be classed as “lower power and low influence”. This includes such activities as project administration, central repository for project information and project reporting. There is less evidence of the existence of structures carrying out predominantly “high power and high influence” functions, such as project selection, project prioritisation and people allocation and assignment. This suggests that, even in organisations that have adopted structures for the centralised control of multi-projects, these structures are not necessarily carrying out the activities commonly associated with such centralised control and regarded as essential by writers such as Ives et al (1993) and Chaffey (1997).

8.3.3 Structures for Selecting and Developing People to Undertake Project Roles

The survey results indicate the use of a number of criteria for selecting people to fulfil project roles. Based on the description of methods for selecting people to work on projects, one can conclude that there is widespread perception that the emphasis in terms of selection criteria shifts as a subject progresses in the field of project management. The initial emphasis in the selection criteria is on technical skills. This emphasis then changes towards project management experience, before finally focusing on skills and competencies.

This perceived change in the emphasis of selection criteria has not been accompanied by any widespread adoption of formal structures for people selection. The survey results in terms of the existence of formal structures for people selection, such as skills databases, are consistent with the findings of Chaffey (1997), who highlighted the difficulties of setting up business structures to facilitate the use of project management in organisations. Only 21% of subjects agreed that a formal structure for selecting people to fulfil a specific project role existed in their organisation, whilst 76% of subjects disagreed that such a structure existed. The remaining subjects did not know whether their organisation had such a structure.

The absence of such structures is further exacerbated by the fact that most of the existing formal structures are merely automating existing manual systems and, hence, do not necessarily imply the use of selection criteria based on assessment of a wide range of technical and managerial skills and competencies. Furthermore, although the development of such structures seems to be driven by organisations with a strong project focus, there is evidence of a lack of agreement as to their benefit even within these organisations.

In terms of developing people to fulfil project roles, the survey results broadly confirm that theories on training are mirrored in practice. Over 60% of subjects stated that they had been provided with training in managing people, team building, project management methods/tools, and leadership, in order to fulfil their main project role. This is consistent with writers on the subject, such as Barnes & Wearne (1993) and Gadeken (1998), who state that training needs to focus on interpersonal and general management skills in addition to project management skills.

However, in a similar fashion to the adoption of formal structures for people selection, the recognition of the various different skills required of project staff has not been accompanied by any widespread adoption of formal structures to help develop people to fulfil project roles. Again, the findings of the survey confirm the difficulties of setting up business structures to facilitate the use of project management in organisations, reported by Chaffey (1997). Only 21% of subjects agreed that there was a formal structure to ensure training was linked to career and personal development. The remaining subjects stated that, to a lesser or greater extent, training was planned using ad-hoc methods. In addition, there was little evidence from the survey of consistent approaches within organisations, with only one organisation having all subjects in agreement that a formal structure was used. This suggests that, in some situations, there is a difference between the theoretical operation of training-related structures and actual practice.

This lack of consistency was also evident in relation to the areas of training provided to project staff. The survey results highlight the fact that different organisations might put an emphasis on training in different areas. For example, the survey reported how one part of an organisation providing banking and other financial services focused their training on the broad competency areas of “technical”, “emotional drive” and “people”. By contrast, another part of the organisation focused on the areas of “emotional drive”, “people” and “organisational”. The differences in focus were explained by the different cultures in the two parts of the organisation, with such differences leading to variations in the emphasis attached to broad skill and competency areas. These results suggest that approaches to training within project environments might well be influenced by characteristics of the organisation. This is consistent with the findings of Constantine (1993), who, in identifying different types of organisation within an organisation paradigm model, suggested that

selection and training of project staff must take into account the existing organisation paradigm. In particular Constantine suggested that people need to be selected and trained to have skills and knowledge that might be lacking, or regarded as relatively unimportant, within an organisation.

Therefore, one can conclude that organisations will need to develop training strategies, in the project arena, that result in people having not only the competencies rated as important within that organisation's culture, but also other necessary competencies that are currently perceived as unimportant. Failure to develop such strategies might lead to project staff having inadequate skills and knowledge and also lead to project staff from different cultures within the same organisation being unable to interact with each other in a familiar, comfortable and effective manner.

Another issue in relation to the selection and development of people to fulfil project roles is raised by the survey results, reported in Chapter 4, Section 4.4.2, relating to the number of project roles carried out by staff in organisations. The survey shows that 61 of the 63 subjects had carried out at least two different project roles during their time in the organisation, with the average being an involvement, either past or present, through undertaking between 5 and 6 of the following different roles:

- Project Manager
- Member of Steering Committee/Strategy Group
- Programme Director/Manager
- Developer of project management processes/procedures
- Manager of project organisation
- Project team member
- End user
- Functional manager supplying people to work on projects
- Project Sponsor
- Functional support to projects.

This finding has implications for the selection and development of project staff. Whilst 43% of the subjects surveyed classed their main project role as that of a practising project manager, it is clear that most also undertook other roles, such as project sponsor or member of a steering committee. Given that the literature highlights the important role of not only project managers but also people undertaking other project roles (Pinto & Covin 1992, Kirby 1996), it follows that the people carrying out these roles must either possess, or develop, the necessary skills and competencies. Therefore, organisations need to develop

strategies for the selection and development of project staff that recognises the likelihood of staff having to carry out, over time, a multiplicity of project roles. Rather than assessing and developing skills and competencies of people based on their involvement in projects exclusively as project managers, organisations will need to have people with, perhaps, a disparate range of skills and knowledge, more appropriate to the effective fulfilling of a variety of project-related roles.

There are also potential implications of people carrying out a multiplicity of project roles for research studies of various stakeholder groups. For example, studies of the importance attached to project success criteria and project critical success factors by different groups of people, by the likes of Pinto & Pinto (1991) and Wateridge (1995), are predicated on these groups, whether they be project managers or end users, only carrying out one project role. The survey results clearly indicate that this is not the case. Therefore, research studies may need to consider the extent to which carrying out a variety of project roles influences opinions and attitudes of project stakeholders and also influences their project management practices.

8.3.4 Matching Capability to Provide People to Undertake Project Work to Demand

A discussion of the survey results, relating to matching capability to provide people to undertake project work to demand, needs to recognise that perceptions of changes in capability are likely to be influenced by an organisation's starting point. For example, the fact that 43% of subjects from traditional public sector organisations stated they had seen an increase in capability probably reflects that such organisations were starting from a low point in terms of their use of project management principles. Hence, care is needed in using perceptions of changes in capability as a way of measuring the level of usage of project management between organisations.

The results in this area are, in part, presented in the form of a force-field analysis of capability to provide enough of the right people to carry out project-related work. This analysis identifies forces facilitating success in increasing capability and forces inhibiting success. Some of the forces facilitating success involve methods of managing supply

besides reducing or increasing employee numbers, relative to demand. These methods include:

- Learning from experience
- Internal development of staff through training and staff development programmes
- Better people selection processes
- Raising the profile of projects and project management
- Development of project management-related structure, processes and procedures.

A key issue facing organisations is their ability to match the supply of people with demand for project work to be undertaken. The use of these different methods suggests that many organisations are, as suggested by Riis & Neergaard (1994), able to establish frameworks for learning and make use of methods other than a change in the levels of available resources.

8.3.5 Structures for the Evaluation of Performance on Projects

The survey results on the topic of structures for evaluating performance in terms of project work shows that 28% of subjects did not have their performance evaluated against project-related objectives. Furthermore, only 11% of subjects had their performance evaluation directly linked to individual projects. The remaining subjects had performance loosely linked to project-related activities. These results are consistent with the results of a previous study by Chaffey (1997) that found that over 25% of organisations did not link their appraisal system to project performance. The survey also highlighted situations in which there were differences between the way an organisation claimed to deal with evaluation of performance and actual practice. For example, the experience of a project manager in an Information Services provider demonstrated that the formal structure established to assess performance at the close of a project's life was not used. The lack of adherence to the required use of the formal structure had led to a high degree of dissatisfaction and demotivation on the part of the project manager.

From these results one can conclude that, as stated by Stokes (1995) and Firth & Krut (1991), the failure to establish formal structures to evaluate project performance in many organisations may lead to problems in terms of exploiting opportunities for improvement in performance. In addition, improvements in performance may be hindered by a failure to adhere in practice to the requirements of any established structure.

8.4 Project Management Systems

8.4.1 Evolution of Project Management Systems

The survey results broadly confirm the three stages of evolution of project management, in terms of the development of company-wide project management systems, described by McDowell (1995), Stokes (1995) and Firth & Krut (1991). Namely, the benefits of project management are sold, a company-wide project management system is set up and, finally, control is devolved within the company-wide system.

However, the survey results suggest some modification of this three-stage process. Firstly, as discussed previously in Section 8.2.1, an increase in the use of project management methods is not as widespread as an increase in the use of project teams. This is reflected in the fact that 60% of subjects stated there was no company-wide system, of any sort, either in existence or being set up. Secondly, there was evidence that, even in organisations with well-established project management systems, the selling of the benefits of project management was still taking place. For example, project-focused organisations with company-wide project management systems with devolved control, which according to theorists is the final stage of evolution, were also selling the benefits of using project management further. Thirdly, some organisations with systems with devolved control were in the process of attempting to increase the level of centralised control to ensure standardisation and consistency of approach across groups within an organisation. This was typified by the experiences of an organisation involved in the reprocessing of nuclear fuel).

These findings suggest that evolution does not necessarily involve a three-step sequential process. Rather, it involves the ongoing selling of the benefits of project management, in order to increase its levels of utilisation. This to be combined with a constant re-assessment, and, if necessary, re-alignment of the balance between centralised control of the project management and devolved control to groups at lower levels within the organisation.

8.4.2 Project Life Cycle Models

Boardman (1994) described how a process model of the project life cycle "... provides a system of shared values, a baseline of understanding and a handle on the business culture." The results of the survey relating to the specific uses of project life cycle models tend to confirm this use.

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successfully used a life cycle model to help develop a common project language, or had witnessed the adverse effect, in the same area, of a failure to consistently utilise such a model. This suggests that project life cycle models have a particular role in developing a common project language, which, according to Kerzner (1994) is an important feature of project organisations.

Also, although some subjects emphasised a model's usefulness in ensuring specific project management activities, such as stating client requirements, are carried out, the greatest influence of such models, in terms of frequency of use, seems to relate to addressing wider organisation issues. For example, the most common use of a model, mentioned by 33% of the 46 subjects using a model, was in ensuring a consistent approach to the management of projects, both across the organisation and over time. Also, the role of a model in both developing a culture of open communications with stakeholders and in demonstrating professionalism to customers was highlighted by 30% of subjects.

The findings relating to project life cycle models suggests that, in order to gain maximum from their use, organisations need to recognise that they involve more than defining and operating key business processes. As an organisation looks to become more project-focused, the models have a role in facilitating the wider use of project management and in helping ensure that features of a project environment, necessary for the effective use of project management, are present. However, organisations also have to be aware that organisation factors, such re-structuring, mergers and de-mergers, may hinder the development and use of project life cycle models. Therefore, organisations will need strategies to identify and overcome the potential negative influence of such factors.

8.4.3 Formalising of Project Life Cycle Activities

The survey results in respect of the broad activities taking place through the project life cycle indicate a possible mismatch between theory and practice. The literature on the subject, see, for example, Barnes & Wearne (1993) and Fangel (1993), highlighted the importance of managing activities "upstream" of a project. Within this framework Turner, McLaughlin et al (1994) identified the development and management of project success criteria and project critical success factors as key upstream activities. The survey results suggest there are a significant number of situations in which neither of these two key

activities is carried out. For example, 28% and 33% of subjects did not carry out formal activities in terms of either defining success criteria or defining the factors influencing success. The relatively low proportion of subjects placing how success is defined and measured and the factors influencing success early in the sequence of activities carried out during the life of a project also suggests that current project management practice is not particularly consistent with project management theory. With “best practice”, according to Turner, McLaughlin et al (1994), putting the sequence, in terms of initiating activities, as: identification of key success criteria, establishment of critical success factors and identification of appropriate methodologies.

In terms of practices consistent with “best practice” theories, as suggested by Turner, McLaughlin et al (1994), the results of the survey indicate that both an individual’s experience of managing projects and their knowledge of project management theories may be influential. For example, the 9 subjects adhering to best practice, and formally developing and managing project success criteria and project critical success factors, either had a great deal of project management experience or had received formal education in project management.

8.4.4 Project Classification

The results indicate that elements related to the project management system, such as project structure and project management processes or procedures, may be modified depending upon the type of project undertaken. For example, 68% of subjects might use different structures for different projects and 59% of subjects might modify the use of formal project management processes or procedures based on the type of project. This suggests that project management practices recognise the need for a contingent approach, at least at the tactical project level, in terms of the utilisation of project management structures and systems. These findings confirm the writings of Fangel (1993) and Payne & Turner (1999) who state the desirability of selecting appropriate project management methods within the context of organisation approaches to the management of projects.

In terms of the factors influencing the selection of different methods the survey found various criteria used. These criteria include the characteristics of the project, the impact on the business and the degree of risk. The underlying trend evident in the survey seems to be

towards the selection of methods based upon an assessment of project management complexity, with complexity being a multi-attribute variable. In this context there are indications that such an assessment is being promoted by the existence of the Association of Project Management's (APM) classification of project complexity, and its use is being led by corporate APM member organisations.

8.4.5 Project Success Criteria

The survey results show that, of the following 16 different project success criteria, only one criterion, on average, is not regarded as important. This criterion is the personal, financial rewards associated with undertaking project work. The 16 criteria are listed in order of importance.

- Client perception
- Meeting specified project objectives
- Smoothness of hand over to operations
- Responsiveness to change
- Cost effectiveness of work
- Improvement in organisational capability
- Growth of others
- Own personal growth
- Level of disruption to organisation
- Avoidance of non-benefit through early cancellation
- Enabling of other project work
- Personal non-financial rewards
- Contribution to continuous improvement
- Adherence to defined procedures
- Degree of process innovation
- Personal financial rewards.

These findings tend to confirm earlier studies, such as Freeman & Beale (1992) and Morris & Hough (1987), that stress the multi-attribute nature of measures of project success. The highest ranked success criterion is client perception, which is consistent with previous work, for example Nicholas (1989), that identifies the satisfaction of key participants, in particular the customer or client, as the best measure of project success.

The importance attached to client perception, the smoothness of the hand over to operations, the improvement in organisational capability and the growth of others suggests the emphasis on stakeholders, see BSI (1995), Morris (1998) and Cleland (1994) is mirrored in practice. For example, the importance attached to the four success criteria mentioned above suggests

that the importance, and potential influence, of the following stakeholder groups is recognised:

Client/customer	(client perception)
Users	(the smoothness of the hand over to operations)
The Organisation	(the improvement in organisational capability)
The Project Team	(the growth of others)

The relatively high ranking for criteria, such as growth of others and own personal growth, alongside more task-oriented measures, such as meeting specified project objectives, also indicates that the multi-attribute nature of project success criteria incorporates both psychosocial and task related outcomes. Furthermore, the importance attached to the improvement in organisation capability shows that measures of success incorporate those with a long-term, non project-specific perspective. The importance attached to these different types of outcomes confirms the findings of the previous study by Pinto & Pinto (1991).

The importance attached to client perception, as the key project success criteria, is reflected in its emphasis in the methods used for defining and measuring project success. The survey results in this area suggest a number of broad conclusions.

Firstly, organisations are looking at ways of measuring client perception, with customer questionnaires being the most commonly used method.

Secondly, there is a distinction between those situations in which project success criteria are defined for each individual project in the pre-implementation stage and those situations in which a set of pre-defined criteria is used. The survey found the first of these situations to be the most common, though pre-defined criteria might be used where a project organisation had a long-standing relationship with a particular customer, leading to a clear understanding of their requirements.

Thirdly, there is recognition of limitations in current methods for dealing with client perception. These limitations focus on two issues. The first issue is the validity of any measure of perception. The results of the survey suggest a belief that merely measuring perceptions once, at the end of the project, does not produce the most reliable results. There is, perhaps, a need to take measures both during and beyond a project's life. This leads to

the second issue; namely, that current methods are reactive in their nature and, whilst they might give accurate measures of perception, they do not allow the project team to influence the client's perceptions. Therefore, organisations will need to develop more proactive approaches to measuring and managing client perceptions.

8.4.6 The Formalising of Project Roles

In the context of defining roles and responsibilities, the survey results allow some possible conclusions to be drawn concerning the reasons for using project management systems. Ninety one percent of subjects allocated roles and responsibilities to projects. Furthermore, the activity of role/responsibility allocation incorporated a disparate range of interested parties. These parties included, in order of frequency of occurrence, the following:

- Project manager
- Customer/client
- Project sponsor
- Customer liaison
- Programme director
- Internal stakeholder
- External stakeholder
- User liaison
- Project team member
- Team leader
- User group
- Quality assurance.

The results indicate that the percentage of subjects formally defining a particular role varies, for example 77% defined the role of project manager, whilst 26% defined the role of user liaison. However, despite these variations, the existence of such a disparate set of defined roles lends weight to the importance attached in the literature, see Van den Honert (1991), to the involvement of stakeholders in the project management system.

The vertical integration of customers and suppliers within the project environment, seen through the formal defining of the roles of customer/client, customer liaison, external stakeholder (suppliers), user liaison and user group, suggests that partnerships with groups external to the project organisation are developed in practice. This practice is consistent with the importance attached to the concept of partnerships in case studies of projects, for example, Milosevic 1990 and Moore et al 1992).

The link between project management and quality management, in terms of their common focus on meeting customer requirements, was highlighted in earlier parts of this chapter. The validity of this link is further enhanced by the emphasis, in terms of defining roles, on the involvement of the customer. Such involvement is likely to facilitate both the identification and management of the criteria important in influencing the customer's perception of the success, or otherwise, of the project.

8.4.7 Project Critical Success Factors

The discussion of project critical success factors in many ways mirrors that of project success criteria. In a similar fashion to measures of success, the survey results stress the relevance of a variety of project critical success factors. Using the framework of factor groups, devised by Belassi & Tukel (1996), one can conclude broad agreement that the factors associated with the project manager/project team, the organisation, and the external environment are universally regarded as being important influences on project success. Where there is less agreement is in relation to factors associated with the project. Potential success factors, listed in order of relevance, and with factor type shown, are listed below:

PROJECT CRITICAL SUCCESS FACTORS	FACTOR GROUP
Project manager's ability to co-ordinate	Project Manager
Project manager's commitment	Project Manager
Team member's commitment	Team Members
Top management support	Organisation
Team member's communication skills	Team Members
Team member's technical background	Team Members
Project manager's perception of their role	Project Manager
Team member's problem solving skills	Team Members
Actions of external clients/competitors/sub-contractors/suppliers	External Environment
Project manager's ability to delegate authority	Project Manager
Project structure	Organisation
Functional manager's support	Organisation
Project champion's skills	Organisation
Project Manager's ability to make trade-offs	Project Manager
Political/Economic/Social/ Technological Environment	External Environment
Project Manager's technical competence	Project Manager
Management complexity of project	Project
Urgency of project	Project
Forces of nature	External Environment
Uniqueness of project activities	Project
Project size/value	Project

Unlike Belassi & Tukel, the general finding of the survey is that factors associated with the project, such as project size/value and uniqueness of project activities, have a relatively low

level of influence on whether a project was successful or not. This contrasts with factors associated with the role of the project manager, project team members and top management, which are regarded as having a high level of influence.

These findings suggest that project success is perceived as being less a factor of the specific characteristics of the project being carried out and more influenced by the skills, competencies and actions of the various stakeholders involved in the project. However, in this context, theories, see, for example, Nicholas (1989), Cash & Fox (1992) and Barnes & Wearne (1993), emphasising the interdependencies between factors are particularly important. For example, the fact that a project that is “urgent” or having a high degree of “management complexity” is not regarded as being influential is probably based on an assumption that factors such as “top management support” are present.

The low rating of project size/value is particularly noteworthy, given that the size/value of a project is one of the criteria used to classify projects. As the classification of a project often influences the selection of project structure and the utilisation of project management processes, the low rating of project size/value suggests one of two conclusions. Either there is an inconsistency between theory and practice in terms of the relevance of project size/value as an influential critical success factor. Or project size/value influences the use of project structures and project management processes in the sense that higher project management overheads are more easily justifiable on projects with greater size or value.

The discussion of methods for managing project critical success factors highlights the fact that there are a variety of approaches used in practice. These range from formal methods to intuitive, informal methods, with a significant proportion of subjects (43%) using no methods at all. It is possible to conclude that the use of formal methods is the most highly evolved approach and the use of informal, intuitive methods the least evolved approach, discounting the approach of using no method at all. Those organisations using formal methods tend to be project-focused, private-sector organisations, with corporate APM membership seeming to be a predictor of the use of formal methods.

The formal methods tend to fall into one of two broad areas. Firstly, those associated with project risk analysis and management. Secondly, those associated with stakeholder

analysis. Even within this highly evolved approach there is evidence of a potential problem in respect of consistency of application, as a number of subjects questioned whether the formal method was applied throughout the project life cycle. For example, risks would be identified at the start of the project but would not be controlled during the implementation stage. Furthermore, a number of subjects stated that the formal methods would not be consistently applied across all projects. From this one can conclude that, at the highest level of evolution, there is acceptance of the principle of formal management of project critical success factors, but also situations in which the principles are not put into practice.

8.4.8 Project Management Processes/Procedures

The survey results relating to formal project management processes/procedures suggest that the existence of such processes/procedures is not particularly widespread. Whilst 53% of subjects worked in organisations in which there were formal project management processes and procedures, 40% of subjects were in organisations that did not have such processes/procedures. However, the results show a general consensus that, where such procedures are formalised, they are useful for the management of projects. For example, 90% of the 31 subjects using formal project management processes/procedures believed they added value.

In some cases, there were situations in which the project management processes/procedures were perceived as useful but were not always used. In some cases the failure to use the processes/procedures was deliberate and reflects the open-minded, non-prescriptive, selection of methods, described by Fangel (1993) and Norton (1994). However, there were situations in which failure to adhere to formal processes/procedures was not intentional. This suggests that the problem of consistency of application, discussed earlier in this chapter in the context of managing project critical success factors, is a pertinent issue in relation to other elements of project management systems.

The survey results suggest that there are two common approaches in terms of developing project management processes/procedures. The first common approach is to develop a process model of the project life cycle and to make adherence to this model mandatory. Other procedures are developed to support this model, but their use is at the discretion of the project manager. The second common approach is to develop a relatively large number of individual processes/procedures, often in excess of 30, and make many of these

processes/procedures mandatory. The need to adhere to related procedures from other parts of the organisation, such as purchasing, finance, and health and safety, would supplement these mandatory procedures.

There is no strong indication that one particular approach is more likely to be perceived as being helpful to the management of projects. However, from the experiences of those organisations with a large number of processes/procedures in existence, one can conclude that there may be an optimum number above which their usefulness becomes somewhat diluted. The key issue seems to be the balance between the need to give an individual the freedom to manage a project and the need to have high-level management controls that apply to all projects in the project environment. In this context, the issue of whether processes and procedures are mandatory is crucial. The survey results suggest that, perhaps, the favoured ideal response is to take the first approach described above: namely, to make the overall project management process which guides the whole of the project life cycle mandatory, but, in addition, to focus on issues, rather than procedures, within that cycle. Therefore, the focus, in terms of the mandatory elements of the system, is on answering the questions why and what, rather than how?

The broad range of areas covered by the project management processes/procedures confirm current theories of project management, see, for example, Turner (1993a) and Barnes & Wearne (1993), that interpret the project life cycle as incorporating both pre- and post-implementation stages. For example, over 70% of subjects with documented processes/procedures described how they covered the upstream activities of conception, planning, definition and start-up. Furthermore, over 60% of subjects stated that the processes/procedures included the downstream activities of performance review and closing down of a project.

The discussion of structures for selecting and developing people to undertake project roles emphasised the lack of any widespread adoption of formal structures for people selection. The lack of formal structures in this area is mirrored by the fact that the area of people selection had the lowest percentage of subjects, less than 30%, indicating that it was covered by the documented processes/procedures. This provides further evidence of the difficulties,

highlighted by Chaffey (1997), of setting up business structures and systems, in the area of people selection, to facilitate the use of project management in organisations.

In terms of other conclusions to be drawn from the areas covered by formal project management processes/procedures, the survey results suggest a possible difference between theory and practice. Case studies, such as Coleman (1994), Firth (1995), Konieczny & Petrick (1994) and Kemp et al (1993), emphasise the importance of managing activities in both the early and latter stages of the project life cycle. However, the survey found situations in which activities might be formally carried out early in the life cycle but not carried through to its latter stages. For example, 80% of subjects had formal processes or procedures covering the topic of defining benefits. However, only 30% of the subjects had formal processes or procedures incorporated downstream benefit management. Other comments by subjects indicated that the absence of such formal processes or procedures also reflected a failure to carry out activities associated with benefit management. These findings suggest that, as was the case with methods associated with project risk, discussed earlier in the chapter, a common problem might not be a failure to carry out pre-implementation activities, but, rather, a failure to follow activities beyond, the implementation stage of the project life cycle.

8.4.9 Project Management Software

The results of the survey show widespread use of computer-based software packages to support the management of projects. For example, 70% of subjects worked in organisations using such packages. A description of the types of packages used suggests that the development of project management software usage is a reflection of wider changes in the field of information technology. The move of computer power from a central data processing function towards an individual's workplace is reflected in the low level of utilisation of central mini/mainframe systems and the high utilisation of standalone personal computer based systems.

The decentralisation of power has led, in some cases, to a lack of standardisation and consistency across organisations in the use of project management software. In some organisations this conflict between the organisation's need for standardisation of packages, perhaps to allow effective management of programmes, and the individual project

manager's desire to retain control of the selection and use of project management software has led to tension. This tension is likely to be exacerbated in situations where there is a mismatch between the nature of the project management system and the characteristics of the information technology system. For example, there is the possibility of conflict if a centralised project management software package is introduced into an organisation with a de-centralised system for managing projects. Organisations will need to develop strategies to ensure that the development of project management software meets the requirement of the wider project management system.

8.4.10 Benchmarking of Project Management

The survey found no widespread existence of the benchmarking of project management processes. Although 21% of subjects were in organisations that carried out benchmarking activities in the project environment, much of the focus of these activities was on comparing the outcomes of project work against either internal or external standards.

In terms of the development of benchmarking activities, the results of the survey suggest that, even within organisations carrying out such activities, there is often a lack of agreement as to their benefit and validity. The questioning of the validity and benefit of benchmarking project management seems to be influenced by previous problems in benchmarking project performance, as distinct from benchmarking project management performance. To overcome this lack of agreement, organisations will need to emphasise the distinction between the benchmarking of project management, with its focus on comparing processes, and the benchmarking of the outcomes of individual projects, with its focus, primarily, on measuring performance against cost, quality and time objectives.

8.5 Influences on Project Management Uses, Structures and Systems

8.5.1 Characteristics of an Organisation

The survey results suggest that, in terms of an organisation's characteristics, whether an organisation is a manufacturer or a service provider, or whether an organisation is in the public or private sector, has little influence on the different project management uses, structures and systems evident in practice.

Specifically, no significant differences were found between manufacturing and service organisations or between public and private sector organisations in the following areas:

- Projects being perceived as applicable vehicles for managing all types of business change
- The uses of project management
- The anticipated benefits from project management (except the benefit of providing a better overview of strategy, which had higher levels of anticipation in the public sector than the private sector)
- Structures for the strategic co-ordination of multi-projects
- Methods used for increasing capability to supply people to work on projects.
- The levels of importance attached to project success criteria
- The relevance attached to different project critical success factors

The main exception to this lack of influence relates to the existence of a structure for the centralised support of project work, which was more prevalent in manufacturing or private-sector organisations than those in the service and public-sector. This difference gives some credence to the suggestion that there may be variations, in such areas as the focus, importance or scope of project management, that explain the greater levels of utilisation of such structures in certain types of organisation. This possibility, though, is not supported by the results relating to structures for the strategic co-ordination of multi-projects. However, the finding that there were no differences in the extent to which public-sector and private-sector organisations set up such structures may, in part, be explained by the fact that other existing organisation structures, not necessarily specifically linked to project management, were being used for such activities.

In the context of the characteristics of an organisation, the main influence on project management structures and systems, found in the survey, was the degree of project focus. Project-focused organisations were much more likely to have the following structures and systems than non project-focused organisations:

- Structure for the strategic co-ordination of multi-projects
- Structure for the centralised support of project management
- Structure for selecting people to undertake project roles.
- A model of the project life cycle
- Formal methods to manage the project success criteria perceived as important
- Formal methods to manage the project critical success factors perceived as relevant
- Formal their project management processes/procedures
- Automated project management information system
- Benchmarking of project management.

The existence of such differences may be useful in terms of helping non project-focused organisations to establish structures and systems as they become more project-focused, and, hence, use project management more extensively. Non project-focused organisations may

hence, use project management more extensively. Non project-focused organisations may be able to use the greater project management experience and practice of the project-focused organisations, as demonstrated by the structures and systems developed by such organisations, to help establish best practice in the area of project management.

Whilst the survey results suggest that the degree of project-focus influences the development of project management structures and systems, the findings also suggest that the influence of the degree of project-focus on the uses of project management is limited. No significant differences were found between project-focused and non project-focused organisations in the following areas relating to the use of project management:

- Projects being perceived as applicable vehicles for managing all types of business change
- The uses of project management (except the use of eliminating competing ideas, for which project management is regarded as more useful in project-focused organisations than in non project-focused)
- The anticipated benefits from project management (except the benefits of reducing time to market, enabling us to better meet customer requirements, increasing responsibility for work carried out, enhancing career opportunities, breaking down hostility to organisational change, providing a better overview of strategy, which had higher levels of anticipation in project-focused organisations than non project-focused).

These findings suggest that some developments in the use of project management, such as a broadening of its applicable work area, as described by Fangel (1994) and Lane (1993), are generic in nature and not necessarily confined to those organisations with a tradition of managing projects.

8.5.2 Subjects' Work Environment

The main area in which the survey highlighted the influence of a subject's work environment relates to the area of project management systems. For example, the results suggest that the existence of a formal quality management system (QMS), such as to the BS EN ISO 9000 standard, may influence the following:

- The development of a *formal model of the project life cycle*
- The development of formal project management processes/procedures
- The review and amendment of formal models and of formal project management processes/procedures.

Therefore, in terms of the development of project management systems, organisations with little experience of project management, but with a formal QMS, may be found to have some of the characteristics normally associated with more project-focused organisations.

Given that the development of such models and processes/procedures is regarded as potentially useful to the management of projects, the “external” influence of a QMS can be regarded as potentially beneficial. However, there are indications that the influence of a QMS and, indeed, other factors in a subject’s work environment may not always be beneficial. Overall the findings of the survey indicate that project management processes/procedures add value. The exceptions to this general finding suggest a negative influence of a QMS. For example, complaints that processes/procedures were used but added little value, focused more on the frustrations of having to adhere to a system developed to meet the requirements of a QMS standard, such as BS EN ISO 9000 or QS 9000.

The potentially negative influence of factors linked to the organisation environment in which projects are undertaken is not confined to the issue of whether a QMS is in existence or not. Problems were also highlighted linked to other factors, such as the nature of the work undertaken and the specific requirements of such work. For example, in some cases the number of mandatory project management processes and procedures developed was influenced by the technical requirements of the work. In situations where in excess of 30 mandatory processes and procedures existed, which was regarded as a less than ideal situation by the project staff working in such an environment, many of the processes and procedures did not relate directly to the project management system. Rather, they were mandatory requirements relating to such issues as Health & Safety, Environmental agencies, work-specific quality assurance bodies, such a defence and construction, in addition to the quality assurance of a QMS.

The potentially positive and negative influence of organisation factors, relating to the area of project management systems, emphasises that the development and operation of such systems cannot be viewed in isolation. Organisations need to consider the environment in which project management systems exist *and ensure that the potential influences are adequately considered.*

8.5.3 Subjects’ Involvement in Projects

The finding that subjects with project experience mainly in newer areas, i.e. organisation change, are more likely to view a project as appropriate for managing all types of business-led change than subjects whose main experience is in traditional areas, i.e. construction, is

significant in the context of selling project management. The survey highlighted a variety of possible obstacles to the further use of project management in organisations. Included in these obstacles were perceptions that project management was not an applicable management tool for certain types of work and perceptions that, even where potentially appropriate, project management would be a bureaucratic, cumbersome methodology. It is clear that, where such perceptions exist, they will need to be overcome if project management is to be utilised more fully. In such situations, staff with experience of using project management in newer work areas might be able to act as change agents, selling the benefits of project management and changing perceptions as to the applicability of project management as an appropriate management tool.

In the remainder of the survey the results indicate that differences in subjects' involvement in projects does result in significant variations in terms of opinions and experiences. Specifically, no differences were found, in terms of a subject's main project experience, main role in projects, involvement in the development of project management processes/ procedures or overseeing/multi-project role, in the following areas:

- The uses of project management
- The anticipated benefits from project management
- The levels of importance attached to project success criteria
- The relevance attached to different project critical success factors.

Whilst the findings of the survey show no significant differences in terms of the overall importance attached to project success criteria, the tests indicate that a subject's involvement in projects does influence perspectives of a small number of success criteria. Specifically, subjects with a direct day-to-day involvement in projects, as a project or programme manager, attach more importance to their own personal growth, as a measure of project success, than do subjects with no such involvement. Also, subjects whose main project experience is on projects with "hard" elements attach more importance to measuring success by the level of adherence to defined procedures than do subjects who mainly work on projects with "soft" elements.

These findings are useful in the context of previous studies of project success criteria. Wateridge (1995) found that the relative importance of project success criteria, based on frequency of mention, varied between project managers and users. Based on the rankings of project success criteria, the findings of the survey confirm such differences for a wider

range of stakeholder groups. However, in terms of the significance of such differences, the results suggest that there are only significant differences in relation to certain groups of people and certain project success criteria.

8.6 Critique of the Research

This section provides a critique on the research contained in this thesis. This involves highlighting the natural limitations of some decisions made during the early stages of the research, for example, in choosing appropriate research methods and measuring instruments. In each case, identification of a potential issue introduces the cost, time and practical difficulties of modifying the research to address the issue. Despite the cost and time involved, such a modification is necessary if the issue raises key questions about the research approach. In this context, the author believes the limitations discussed do not indicate fundamental weakness with the research approach adopted, and they do not jeopardise the aims of the study. Furthermore, in some cases, the issues are beyond the scope of this study. Such issues can be used to identify possible areas for future research.

The first broad, noteworthy issue relates to the research approach used in the study. In concluding the literature review and the development of the research questions and research hypotheses the great number of specific issues to be investigated and the broad nature of the area of study were highlighted. In order to carry out such a broad investigation, and collect a wide range of disparate data, the research draws upon methods from Positivism and Phenomenology philosophies.

Theorists state the appropriateness, and desirability, of combining methods from both philosophies and this justifies the research approach adopted in this study of project management. However, taking this approach does have its limitations. For example, drawing upon Positivist principles, the survey collected quantitative data in such areas as the uses of project management, importance of success criteria, and relevance of critical success factors. At the same time, the large amount of disparate quantitative and qualitative data required, led to the utilisation of an interviewer-administered questionnaire and this placed a limit on the sample size.

Given this decision, it was only possible to obtain a sample of quantitative data allowing an exploratory analysis. Given more time and resources, it would have been desirable to obtain more data in some of the quantitative areas described above, perhaps through a shorter, more focused postal questionnaire. This would allow a more rigorous testing of some of the hypotheses. For example, a larger sample of quantitative data relating to the specific uses of project management would allow further testing of the hypothesis that business, organisation and work-related factors influence project management practice.

By way of contrast, drawing upon the Phenomenology philosophy, the survey obtains qualitative data from a sample of subjects carrying out a variety of project roles relating to different types of project. Some subjects have a great deal of project management experience and current involvement in the management of projects, whilst other subjects have less experience and less involvement. In terms of investigating the influence of the work environment on project management practice this variety is essential. However, there are areas of the research where the low levels of experience or involvement mean a subject's opinions are less useful than the opinions of a subject with more experience or involvement. For example, useful qualitative data relating to methods for managing project success criteria and project critical success factors is mainly obtained from those subjects with either a great deal of past project management experience or a high current level of involvement in projects, for example, as a practising project manager.

A second issue is the measuring instrument used to obtain data in a number of areas. The research obtains information about the attitudes of industry practitioners by utilising itemised rating scales and Likert scales, and this information indicates current project management practices. Furthermore, the use of purposive, heterogeneous sampling ensures the reliability and relevance of these attitudes to the area of investigation. However, there are situations in which other measuring instruments would perhaps confirm the reliability of the data. It would be useful to supplement these opinions with information relating to the performance of individual projects. Comparing actual project performance with these criteria may confirm, or perhaps contradict, the opinions of those surveyed. Although there are problems in obtaining reliable and useful data in this area, as highlighted in the discussion of benchmarking project performance in Chapter 7, Section 7.13.

For example, opinions highlight the importance attached to meeting client requirements and using customer focus as the rationale for a project management system. It would be useful to have corroborating information in these, and other, areas from customers and clients who are external to the organisation. Also, in terms of corroborating information, there are situations where an independent audit would confirm the existence of specific project features. For example, the existence of project-focused meetings could be verified by examining organisation records.

A final issue relates to ensuring heterogeneity, in terms of their business environments, in the sample of organisations. The survey distinguishes between different business environments in a variety of ways. These ways include business sector and degree of project-focus. Business sector is determined using a widely accepted classification, the Association of Project Management's business classification, whilst the other means of classification are based on the comments made by subjects, and the author's investigations, during the survey. It would be useful to investigate further methods, perhaps focused on using quantitative data, for classifying business environments.

8.7 Areas for Future Work

A potential area for further study relates to using the survey results to establish models of project management practice in different organisation contexts. Related to this would be a study of the processes for utilising the model to increase project management use. In order to verify its validity, the model needs testing in the field. In a similar fashion to this study's survey, a purposive, heterogeneous sample, drawing from a variety of business, organisation and work environments, is an appropriate research approach. However, the study will also seek corroborating evidence, such as business results and quantitative data regarding project performance, as was discussed in the previous section. This will provide not only material about the validity of the model in generic terms but also further data regarding the influence of environmental factors on the model detail. As such, using information from this further research leads to the model being either extended or modified as required.

The study presents examples of different project management practices, with the suggestion that there are two levels of project management maturity, least and most mature. This gives a clear comparison of the characteristics of organisations with well-developed project

management practices and those with a less developed approach. Further work will establish the characteristics of organisations at possible intermediate levels between least mature and most mature. Linked to the issue of identifying intermediate levels is the area of measuring project management maturity. Information regarding different stages of project management maturity is pertinent in an investigation of ways of using the model to classify an organisation's maturity in the use of project management. Such a measurement is a necessary first step of a process to increase use of project management. Further work will also focus on developing a framework of the different characteristics and behaviour of mature project management practices.

In relation to developing a process for both measuring and, subsequently, increasing project management maturity, further study will focus on the links between the disciplines of quality management and project management.

It is possible that models from the discipline of quality management can provide the framework for developing models of project management maturity. It is also likely that further cross-fertilisation of principles between the disciplines is possible. For example, there are a variety of well-defined methods for self-assessing an organisation using the Business Excellence Model, see British Quality Foundation 1998 and 1998a. Further work will establish the suitability of such methods, albeit in a modified form, for assessing project management maturity. As highlighted by the survey, it is likely that, as for TQM-related change programmes, the way project management is introduced might influence its success. Hence, study of the processes associated with TQM initiatives will provide pertinent material in terms of developing methods for increasing project management maturity.

The previous section highlighted the limitations of drawing from both Positivist and Phenomenology philosophies in developing the research approach. Further work will address these limitations. For example, future work will use Positivist principles and collect quantitative data in such areas as the uses of project management, and the importance of project success criteria, perhaps using a postal questionnaire. Other work will use Phenomenology principles and collect qualitative data, in such areas as the detailed methods for managing the project life cycle, from a small number of organisation "cases". Though both these separate studies will also provide pertinent material in relation to the

development and use of project management models, described in the first paragraph of this section.

Applying project management models will provide an organisation with information about its approach to managing projects. Heindel & Kasten (1997) state that “quality project management requires the involvement and the sharing of information between many classes of users”. The development of an “enterprise management system” leads to this involvement and sharing of information, as it integrates all the information systems in the organisation. Often this integration involves consideration of the use of technology, such as data communications and telecommunications, and the automation of information processes. For models of project management to be of maximum use, information relating to their use must be available across the enterprise. Hence, an area of further study is how best to integrate a project management information system, relating to the use of models, into an organisation's enterprise management system.

8.8 Concluding Remarks

The findings of this study provides evidence, from a wide variety of organisation, work and project settings, of current project management practice relating to the uses of project management and the project management structures and systems established to support project work. In some situations this evidence is used to confirm theoretical developments described in the literature. In other situations the evidence suggests modifications to existing project management theory.

The comparison of different opinions, attitudes, behaviours and experiences, particularly between subjects working in environments with a traditional focus on project work and subjects working in environments with no such focus, provides information about the potential characteristics of best practice in project management. This information will be useful to organisations as they increase their focus on projects and, hence, look to make more use of project management.

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Appendix 3.1: Final Questionnaire

QUESTIONNAIRE REF:

**Liverpool Business School
Liverpool John Moores University
John Foster Building, 98 Mount Pleasant
Liverpool, L3 5UZ**

**PROJECT MANAGEMENT MATURITY
QUESTIONNAIRE**

**David James Bryde
Senior Lecturer
Liverpool Business School**

Appendix 3.1 (Cont.)

INTRODUCTION

77. <i>Company/organisation</i>	* To be coded in later Unique key identifier (company)
.....	01

This questionnaire forms part of a survey of the maturity of project management in organisations.

The questionnaire is anonymous. There are no right or wrong answers. Please give your honest and spontaneous opinion.

The questionnaire will take about minutes to complete.

Appendix 3.1 (Cont.)

78. What is the name of your organisation?

*** To be coded in later
Unique key identifier (organisation)**

.....

01

Could you please supply some background information about your company/ "organisation" and about yourself (*note to interviewer - need to obtain information about size of company/organisation/function, business sector and the general business/competitive environment in which the company/organisation operates).

.....

79. Please indicate the function of the part of the organisation you work in (SHOW CARD 79).

- A. Sales

01

- B. Marketing

02

- C. Information Systems

03

- D. Service operations

04

- E. Production

05

- F. Finance

06

- G. Engineering/Design

07

- H. Logistics

08

- I. Personnel

09

- J. Project management

10

- K. Other

11

Please specify

Appendix 3.1 (Cont.)

80. Is your organisation a member of any project management organisations (for example, corporate member of APM)?

Yes

No

Don't know

If Yes, please give details

81. Please state your current job title

82. How long have you been working within your part of the organisation?

Less than 12 months

1- less than 3 years

3- less than 5 years

More than 5 years

83. How long have you been working for the company/organisation?

Less than 12 months

1- less than 3 years

3- less than 5 years

More than 5 years

Appendix 3.1 (Cont.)

SECTION 1: THE RESPONDENT'S VIEWS ON THE ROLE OF PROJECTS AND PROJECT MANAGEMENT

Firstly I would like to ask you some questions about the role of projects and project management in your organisation.

I would like you to consider the following definitions of a project (SHOW CARD 1).

1. Which statement best fits your own definition of a project?

- | | | |
|--|----|--------------------------|
| A project is used to manage major, one-off capital-intensive work activities in such areas as construction, engineering or the introduction of new systems | 01 | <input type="checkbox"/> |
| A project is a vehicle for tackling all business-led change within an organisation. | 02 | <input type="checkbox"/> |
| Don't know | 03 | <input type="checkbox"/> |

The next question focuses on the role of projects in your organisation (SHOW CARD 2).

2. Which statement best describes the importance of projects to your organisation? (Only tick one box)

- | | | |
|---|----|--------------------------|
| Projects make or break our organisation | 01 | <input type="checkbox"/> |
| Projects have an enormous impact on the success of our organisation | 02 | <input type="checkbox"/> |
| Projects are an increasingly important component of our organisation's success. | 03 | <input type="checkbox"/> |
| Projects are not important to our organisation | 04 | <input type="checkbox"/> |
| Don't know | 05 | <input type="checkbox"/> |

Appendix 3.1 (Cont.)

3. I would now like you to focus on the current uses of project management in your work environment (SHOW CARD 3.) In your personal opinion how would you rate the current usefulness of project management against each of the following?

		V. Imp.	Imp.	Neutral	Unimp.	V. Unimp.	Don't Know
A.	Co-ordination of work	<input type="checkbox"/>					
B.	Co-ordination of resources	<input type="checkbox"/>					
C.	Meeting time project objectives	<input type="checkbox"/>					
D.	Meeting cost project objectives	<input type="checkbox"/>					
E.	Meeting quality project objectives	<input type="checkbox"/>					
F.	Facilitating innovation	<input type="checkbox"/>					
G.	Facilitating creativity	<input type="checkbox"/>					
H.	Building new knowledge	<input type="checkbox"/>					
I.	Eliminating competing ideas	<input type="checkbox"/>					
J.	Prioritising work	<input type="checkbox"/>					
K.	Firefighting/resolving crises	<input type="checkbox"/>					
L.	Setting new product/service specifications	<input type="checkbox"/>					
M.	Controlling management processes	<input type="checkbox"/>					
N.	Identification/resolution of business-related issues	<input type="checkbox"/>					
O.	Measurement of continuous improvement	<input type="checkbox"/>					
P.	Management of continuous improvement	<input type="checkbox"/>					
Q.	Other	<input type="checkbox"/>	<input type="checkbox"/>				

Please specify

Appendix 3.1 (Cont.)

4. I would like you to consider areas of weakness in terms of project management. Are there any areas where project management could be more useful than it currently is?

Yes No Don't know

If YES, please specify

*** Note to interviewer**
If the answer to question 4. was "NO" or was "DON'T KNOW", go to Q.6

5. What in your opinion is the main reason for the failure to get maximum use from project management in the areas you have identified above?

.....

6. Which of the following statements best describes the status of project management in your organisation? (SHOW CARD 6).

- | | | | |
|----|--|----|--------------------------|
| A. | The benefits of using project management more fully are currently being promoted in the organisation | 01 | <input type="checkbox"/> |
| B. | A company-wide project management system is being/has been set up | 02 | <input type="checkbox"/> |
| C. | A company-wide system of project management with devolved control is being/has been set up | 03 | <input type="checkbox"/> |
| D. | Other. Please specify..... | 04 | <input type="checkbox"/> |
| E. | Don't know | 05 | <input type="checkbox"/> |

Appendix 3.1 (Cont.)

7. Since you have been working for the organisation, have you seen a change in any of the following areas? (SHOW CARD 7).

	NO	YES	INCREASE	DECREASE
A. The role of projects as a strategic tool	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B. The use of project team structures to manage work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C. The use of project management methods (such as Critical Path Method)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D. Don't know				<input type="checkbox"/>

*** Note to interviewer**
 If the answer to question 7 was "NO" for all of the statements or was "DON'T KNOW", go to "SECTION 2: PROJECT ROLES"

8. In your personal opinion how would you rate the following factors in influencing the changes you have identified in Q.7 (S.C 8)?

	Not Appli.	V. Imp	Imp.	Neutral	Unimp.	V. Unimp.	Don't Know
A. A new business strategy	<input type="checkbox"/>						
B. Increased competition	<input type="checkbox"/>						
C. More demanding customer	<input type="checkbox"/>						
D. Greenfield venture/re-start	<input type="checkbox"/>						
E. Introduction of new tech.	<input type="checkbox"/>						
F. Introduction of new mngt.	<input type="checkbox"/>						
G. Other	<input type="checkbox"/>	<input type="checkbox"/>					

Please specify

9. If you have chosen more than one factor which is the most important?

Please give reasons

Appendix 3.1 (Cont.)

SECTION 2: THE PROJECT ROLES CARRIED OUT BY THE RESPONDENT

This section asks you about the various roles you carry out now, or have carried out in the past, in relation to project work (SHOW CARD 10).

10. In which of the following ways have you/or did you have an involvement in projects?

	Current role	Past role
A. Member of steering committee/ strategy group overseeing projects	<input type="checkbox"/>	<input type="checkbox"/>
B. Formal Sponsor of individual project	<input type="checkbox"/>	<input type="checkbox"/>
C. End user of project's product or service	<input type="checkbox"/>	<input type="checkbox"/>
D. Project Manager	<input type="checkbox"/>	<input type="checkbox"/>
E. Project team member	<input type="checkbox"/>	<input type="checkbox"/>
F. Manager of a project organisation	<input type="checkbox"/>	<input type="checkbox"/>
G. Functional manager supplying people to projects	<input type="checkbox"/>	<input type="checkbox"/>
H. Functional support to project work (e.g. purchasing, finance)	<input type="checkbox"/>	<input type="checkbox"/>
I. Programme director (responsible For multi-project work	<input type="checkbox"/>	<input type="checkbox"/>
	programme)	<input type="checkbox"/>
J. Other project stakeholder Please specify	<input type="checkbox"/>	<input type="checkbox"/>
K. Other support to project work (e.g. development of project management processes/procedures) Please specify	<input type="checkbox"/>	<input type="checkbox"/>

11. If you carry out/or have carried out more than one role, which one fits your primary involvement in projects?

Appendix 3.1 (Cont.)

SECTION 3: THE TYPE OF PROJECT WORK CARRIED OUT BY THE RESPONDENT

12. In which of the following work areas are you currently involved with projects or have been involved with projects in the past (SHOW CARD12)?

	Currently involved	Involved in the past
A. Strategic/Mission planning	<input type="checkbox"/>	<input type="checkbox"/>
B. Research & Development	<input type="checkbox"/>	<input type="checkbox"/>
C. Administrative & Procedural	<input type="checkbox"/>	<input type="checkbox"/>
D. Manufacturing/Engineering	<input type="checkbox"/>	<input type="checkbox"/>
E. New "product" development/ introduction	<input type="checkbox"/>	<input type="checkbox"/>
F. Construction	<input type="checkbox"/>	<input type="checkbox"/>
G. Plant maint./comm.	<input type="checkbox"/>	<input type="checkbox"/>
H. New system development/ introduction	<input type="checkbox"/>	<input type="checkbox"/>
I. Operational planning	<input type="checkbox"/>	<input type="checkbox"/>
J. Re-location	<input type="checkbox"/>	<input type="checkbox"/>
K. Re-structuring	<input type="checkbox"/>	<input type="checkbox"/>
L. Education & training	<input type="checkbox"/>	<input type="checkbox"/>
M. Business Process Reeng (BPR).	<input type="checkbox"/>	<input type="checkbox"/>
N. Other	<input type="checkbox"/>	<input type="checkbox"/>
	Please specify

13. In which of these work areas is your main involvement with projects?

Appendix 3.1 (Cont.)

SECTION 4: THE PARTIES INVOLVED

In this section I would like you to focus on the various roles people fulfil in a project environment.

14. What criteria are used to select you to fulfil your main project role (S.C 14)?

(You may select as many criterion as are appropriate)

- | | | | |
|------------|--------------------------------------|----|--------------------------|
| A. | Technical experience | 01 | <input type="checkbox"/> |
| B. | Project management experience | 02 | <input type="checkbox"/> |
| C. | Academic/professional qualifications | 03 | <input type="checkbox"/> |
| D. | Position/current job in organisation | 04 | <input type="checkbox"/> |
| E. | Skills/competences | 05 | <input type="checkbox"/> |
| F. | Lack of other available resources | 06 | <input type="checkbox"/> |
| Other | | 07 | <input type="checkbox"/> |
| | Please specify | | |
| Don't know | | 08 | <input type="checkbox"/> |

15. If you selected more than one criterion, which in your opinion is the main one used in your selection?

- | | | |
|----------------|----|--------------------------|
| | 01 | <input type="checkbox"/> |
| Not applicable | 02 | <input type="checkbox"/> |

16. Is there a formal structure/system for selecting people to fulfil a role for a specific project in your organisation (such as a skills database)?

- | | | |
|-----------------------------|-----------------------------|-----------------------------|
| YES | NO | DON'T KNOW |
| <input type="checkbox"/> 01 | <input type="checkbox"/> 02 | <input type="checkbox"/> 03 |

If yes, Please provide details

Appendix 3.1 (Cont.)

17. In which of the following areas have you been provided with training in order to carry out your main project role (You may select more than one) (S.C 17)?

- | | | | |
|------|------------------------------------|----|--------------------------|
| A. | Technical (specialized discipline) | 01 | <input type="checkbox"/> |
| B. | Project management. methods/tools | 02 | <input type="checkbox"/> |
| C. | Team building | 03 | <input type="checkbox"/> |
| D. | Leadership | 04 | <input type="checkbox"/> |
| E. | Managing People | 05 | <input type="checkbox"/> |
| F. | Marketing | 06 | <input type="checkbox"/> |
| G. | Finance | 07 | <input type="checkbox"/> |
| H. | Quality Management | 08 | <input type="checkbox"/> |
| I. | Other
Please specify | 09 | <input type="checkbox"/> |
| None | | 10 | <input type="checkbox"/> |

*** Note to interviewer**

**If the answer to the above question is "NONE",
go to question 19.**

18. Which of the following statements best describes how your training is planned. (Please select only one) (SHOW CARD 18).

- | | | |
|----|--|--------------------------|
| A. | The training is provided on an ad-hoc basis as the need arises | <input type="checkbox"/> |
| B. | The training is formally planned as part of career development | <input type="checkbox"/> |
| C. | The training is a mixture of both ad-hoc and formal methods | <input type="checkbox"/> |
| D. | Other. Please specify..... | <input type="checkbox"/> |

Appendix 3.1 (Cont.)

19. Which of the following statements best describes how your performance is evaluated, included in evaluation is reward & recognition (SHOW CARD 19)?

- A. My performance is not evaluated against project work/project-related goals/objectives
- B. My performance evaluation is built into the project management process of individual projects
- C. My performance is evaluated outside individual projects but against goals/objectives specifically related to project-related objectives

20. For each project role (SHOW CARD 20) please indicate whether roles are formally defined

- | | Formally Defined |
|-------------------------|----------------------|
| A. Customer/Client | <input type="text"/> |
| B. Project Sponsor | <input type="text"/> |
| C. Project Manager | <input type="text"/> |
| D. Programme director | <input type="text"/> |
| E. External stakeholder | <input type="text"/> |
| Please specify | |
| F. Internal stakeholder | <input type="text"/> |
| Please specify | |
| G. Custome liaison | <input type="text"/> |
| H. User liaison | <input type="text"/> |
| I. Other | <input type="text"/> |
| Please specify | |

Appendix 3.1 (Cont.)

21. If roles are formally defined, what methods are used?

.....
.....

24. Which of the following statements best fits your organisation's current position in terms of ability to manage projects (SHOW CARD 24)?

- A. Our capability to provide enough of the right people to carry out project-related work is increasing
- B. Our capability to provide enough of the right people to carry out project-related work is decreasing
- C. Our capability to provide enough of the right to carry out project-related work is fairly constant

** Note to interviewer*
' If the answer question 24 is "C" go to
"SECTION 5: PROJECT SUCCESS CRITERIA"

25. What in your opinion is the single most significant reason for the change in capability?

.....

Appendix 3.1 (Cont.)

SECTION 5: PROJECT SUCCESS CRITERIA (HOW SUCCESS IS MEASURED)

26 *How important to you are the following measures of success (SHOW CARD 26)?*

	V. Imp.	Imp.	Neutral	Unimp.	V. Unimp.	Don't K
A. The meeting of specified project objectives	<input type="checkbox"/>					
B. Client perception	<input type="checkbox"/>					
C. Degree of product/process innovation	<input type="checkbox"/>					
D. The cost effectiveness of the project work	<input type="checkbox"/>					
E. Level of disruption to the organisation whilst the project is being carried out	<input type="checkbox"/>					
F. The improvement in organisation capability in terms of managing future project work	<input type="checkbox"/>					
G. Your own personal growth (in terms of new skills/experience/career opportunities)	<input type="checkbox"/>					
H. The growth of others (in terms of new skills/experiences/career opportunities)	<input type="checkbox"/>					
I. The responsiveness of the project to change	<input type="checkbox"/>					
J. The smoothness of the handover to operations	<input type="checkbox"/>					
K. The avoidance of non-benefit/unnecessary cost through early cancellation	<input type="checkbox"/>					
L. The degree of adherence to defined procedures	<input type="checkbox"/>					
M. The successful enabling of other project work	<input type="checkbox"/>					
N. The contribution of the project to <i>quality</i> /continuous improvement programmes	<input type="checkbox"/>					
O. The personal financial rewards given for project work	<input type="checkbox"/>					
P. The personal non-financial recognition given for project work	<input type="checkbox"/>					
R. Other Please specify.....	<input type="checkbox"/>	<input type="checkbox"/>				

Appendix 3.1 (Cont.)

29. What specific methods if any are used to manage success criteria?

.....

I would like your opinion on the following statement (using the scale provided).

30. “My organisation is very successful at managing projects”

S. Agree	Agree	Neutral	Disagree	S. Disagree	Don't Know
<input type="checkbox"/>					

30A. Are there other organisations within your company/organisation or external to your company/organisation that, in your experience, are particularly good at managing projects?

YES	<input type="checkbox"/>	NO	<input type="checkbox"/>
-----	--------------------------	----	--------------------------

If YES, please specify

30B. Can you please give details of their main characteristics in terms of project management.

.....

Appendix 3.1 (Cont.)

SECTION 6: PROJECT CRITICAL SUCCESS FACTORS (INFLUENCES)

31. Please indicate your opinion of the following statement for the factors listed (SHOW CARD 31).

***“Project success is a factor of the*”**

	S. Agree	Agree	Neutral	Disagree	S. Disa	D. Know
A. project manager’s ability to delegate authority	<input type="checkbox"/>					
B. project manager’s ability to make tradeoffs	<input type="checkbox"/>					
C. project manager’s ability to co-ordinate	<input type="checkbox"/>					
D. project manager’s perception of role/responsibility	<input type="checkbox"/>					
E. project manager’s competence	<input type="checkbox"/>					
F. project manager’s commitment	<input type="checkbox"/>					
G. team member’s technical background	<input type="checkbox"/>					
H. team member’s communication skills	<input type="checkbox"/>					
I. team member’s problem solving skills	<input type="checkbox"/>					
J. team member’s commitment	<input type="checkbox"/>					
K. project size/value	<input type="checkbox"/>					
L. uniqueness of project activities	<input type="checkbox"/>					
M. management complexity of project	<input type="checkbox"/>					
N. urgency of project	<input type="checkbox"/>					
O. top management support	<input type="checkbox"/>					
P. project structure	<input type="checkbox"/>					
Q. functional manager’s support	<input type="checkbox"/>					
R. project champion’s skills	<input type="checkbox"/>					
S. external environment (PEST)	<input type="checkbox"/>					
T. forces of nature	<input type="checkbox"/>					
U. actions of external clients, competitors, sub-contractors, suppliers	<input type="checkbox"/>					
V. Other Please specify	<input type="checkbox"/>	<input type="checkbox"/>				

Appendix 3.1 (Cont.)

34. *What specific methods, if any, are used to manage project success and failure factors?*

.....

Appendix 3.1 (Cont.)

SECTION 7: PROJECT MANAGEMENT PROCESSES

35. Do you use a model of the stages of project life cycle when managing projects (e.g. initiation stage, definition stage, implementation stage)?

- | | | |
|------------|--------------------------|----|
| Always | <input type="checkbox"/> | 01 |
| Sometimes | <input type="checkbox"/> | 02 |
| Never | <input type="checkbox"/> | 03 |
| Don't know | <input type="checkbox"/> | 04 |

35A. If ALWAYS or SOMETIMES, what is the main purpose of the model?

.....

I would like you to consider the sequence of activities in managing projects (SHOW CARD 36)

36. Please indicate whether an activity takes place and, if it does, where the activity fits in the overall order (ie.g. first, second, etc)

	Takes place	Position in sequence
How the project will be managed (the processes/ Procedures to be followed)	<input type="checkbox"/>	<input type="checkbox"/>
What factors influence success/failure	<input type="checkbox"/>	<input type="checkbox"/>
How the project will be structured (i.e. dedicated team)	<input type="checkbox"/>	<input type="checkbox"/>
Allocation of project roles/responsibilities	<input type="checkbox"/>	<input type="checkbox"/>
How success is defined and measured	<input type="checkbox"/>	<input type="checkbox"/>
Other Please specify	<input type="checkbox"/>	<input type="checkbox"/>
Don't Know	<input type="checkbox"/>	<input type="checkbox"/>

Appendix 3.1 (Cont.)

37. Are the organisation's project management processes benchmarked in any way?

YES	NO	DON'T KNOW
<input type="text" value="01"/>	<input type="text" value="02"/>	<input type="text" value="03"/>

If Yes Please provide details

38. How do you classify project work? For example by type of work undertaken, by project cost/duration/complexity, by the resources required, the degree of risk, uniqueness, type of business benefit?

.....

.....

*** Note to interviewer**

If the answer to Q.38 is "NONE" or "DON'T KNOW", go to Q.42

40. Does the classification criteria influence the choice of project structure? i.e the use of dedicated teams/part-time teams?

YES	NO	DON'T KNOW
<input type="text" value="01"/>	<input type="text" value="02"/>	<input type="text" value="03"/>

If yes, Please provide details.....

41. Does the classification criteria influence the choice of formal project management processes/procedures adhered to or followed?

YES	NO	DON'T KNOW
<input type="text" value="01"/>	<input type="text" value="02"/>	<input type="text" value="03"/>

If yes, Please provide details.....

Appendix 3.1 (Cont.)

42. Does a set of documented project management procedures exist in your organisation?

YES	NO	DON'T KNOW
<input type="text" value="01"/>	<input type="text" value="02"/>	<input type="text" value="03"/>

*** Note to interviewer**

If the answer to the above question was NO or DON'T KNOW, go to

“SECTION 8: THE BENEFITS AND PROBLEMS OF USING PROJECT MANAGEMENT”.

43. Please give an indication of the number of MANDATORY formal project management procedures that exist in your project environment.

1-10	<input type="text" value="1"/>	11-30	<input type="text" value="2"/>	31+	<input type="text" value="3"/>
Don't know	<input type="text" value="4"/>				

Appendix 3.1 (Cont.)

44. Please indicate in which of the following areas (SHOW CARD 44) the processes/procedures relate to.

- | | | |
|----|--|---------------------------------|
| A. | Conception/initiation of a project idea | <input type="text" value="01"/> |
| B. | Project selection/prioritisation | <input type="text" value="02"/> |
| C. | Project start-up | <input type="text" value="03"/> |
| D. | Defining of benefits, goals, objectives. | <input type="text" value="04"/> |
| E. | Planning time, cost, scope of work | <input type="text" value="05"/> |
| F. | Managing risk | <input type="text" value="06"/> |
| G. | Change management | <input type="text" value="07"/> |
| H. | Contract management | <input type="text" value="08"/> |
| I. | Monitoring and controlling a project | <input type="text" value="09"/> |
| J. | Closing down a project | <input type="text" value="10"/> |
| K. | Handover of project deliverables | <input type="text" value="11"/> |
| L. | People selection | <input type="text" value="12"/> |
| M. | Benefit management | <input type="text" value="13"/> |
| N. | Quality improvement | <input type="text" value="14"/> |
| O. | Performance review/monitoring | <input type="text" value="15"/> |
| P. | Configuration management | <input type="text" value="16"/> |
| Q. | Don't know | <input type="text" value="17"/> |
| R. | Other | <input type="text" value="18"/> |

Please specify

Appendix 3.1 (Cont.)

45. Please give your opinion of the following statements (SHOW CARD 45).

- | | | |
|---|----|----------------------|
| A. Formal processes/procedures are used, helping us to better manage our projects | 01 | <input type="text"/> |
| B. Formal processes/procedures are used, but add little value | 02 | <input type="text"/> |
| C. Formal processes/ procedures are not used | 03 | <input type="text"/> |
| Other. Please specify | 04 | <input type="text"/> |

46. Are the formal project management procedures ever amended?

- | | | |
|-------------------------|-------------------------|-------------------------|
| YES | NO | DON'T KNOW |
| <input type="text"/> 01 | <input type="text"/> 02 | <input type="text"/> 03 |

*** Note to interviewer,**

Only ask the next question if the answer to Q. 46 is "Yes"

47. Please indicate under which situations amendments may take place (SHOW CARD 22).

- | | | |
|--|----|----------------------|
| A. As a formal project activity based on the experience of past projects | 01 | <input type="text"/> |
| B. As part of general ongoing continuous improvement programmes | 02 | <input type="text"/> |
| C. During an individual project at the discretion of one of the project parties (e.g. manager, sponsor). | 03 | <input type="text"/> |
| Please specify who | | |
| D. Other | 04 | <input type="text"/> |

Appendix 3.1 (Cont.)

SECTION 8: THE BENEFITS AND PROBLEMS OF USING PROJECT MANAGEMENT.

Appendix I (Cont.)

50. *I would like you to think about the future. Please indicate your opinion of the following statement for the factors listed (SHOW CARD 50).*

“Using project management methods/project teams will give us benefits by.....”

	S. Agree	Agree	Neutral	Disagree	S. Disa	D.K
A. helping us survive as a business	<input type="checkbox"/>					
B. enabling us to better meet customer requirements	<input type="checkbox"/>					
C. helping to cut our costs and maintain output/quality levels	<input type="checkbox"/>					
D. reducing time-to-market for new products/services	<input type="checkbox"/>					
E. helping us increase our output with the same unit of resource	<input type="checkbox"/>					
F. making us more innovative/creative	<input type="checkbox"/>					
G. providing a better overview of our strategy	<input type="checkbox"/>					
H. providing a way of managing organisational change	<input type="checkbox"/>					
I. breaking down employees hostility to organisational change	<input type="checkbox"/>					
J. providing enhanced career opportunities	<input type="checkbox"/>					
L. aligning reward/recognition systems to actual work carried out by employees	<input type="checkbox"/>					
L. increasing employee responsibility for work carried out	<input type="checkbox"/>					
M. aligning desired employee skills/behaviour to actual work carried out	<input type="checkbox"/>					
N. making employees more motivated	<input type="checkbox"/>					
O. Other Please specify	<input type="checkbox"/>	<input type="checkbox"/>				

Appendix 3.1 (Cont.)

SECTION 9: THE ORGANISATIONAL ENVIRONMENT

In this section I would like you to think about the structures used to manage projects (SHOW CARD 51).

51. Which of the following describes your project environment?

- | | | |
|--|----|--------------------------|
| A. Projects are managed by our own organisation
(on behalf of our organisation) | 01 | <input type="checkbox"/> |
| B. Projects are managed by our own organisation
on behalf of another section/dept. in our company | 02 | <input type="checkbox"/> |
| C. Projects are managed by our own organisation
on behalf of external companies | 03 | <input type="checkbox"/> |
| D. Projects are managed on our behalf by another
organisation in our company | 04 | <input type="checkbox"/> |
| E. Projects are managed on our behalf by an
external company | 05 | <input type="checkbox"/> |

51a. Please describe the structures used to manage projects, such as a dedicated project team structure or a matrix management structure.

.....

52. Please indicate which statement best describes how project structures are chosen in your organisation (SHOW CARD 52).

- | | | |
|--|----|--------------------------|
| A. The project structure is chosen to fit the requirements
of an individual project and is selected by a group
outside the organisation (e.g. senior management,
project office/support group, sponsor) | 01 | <input type="checkbox"/> |
| B. The project structure is chosen to fit the requirements of an
individual project and is selected within the project organisation | 02 | <input type="checkbox"/> |
| C. A single project structure, which has been created outside the
organisation (e.g. senior management, project office/support group,
sponsor) is applied to all projects | 03 | <input type="checkbox"/> |
| D. A single project structure which has been created within the
project organisation is applied to all projects | 04 | <input type="checkbox"/> |
| E. Don't know | 05 | <input type="checkbox"/> |

Appendix 3.1 (Cont.)

I would now like you to think about the benefits of project structures used in your organisation.

53. Please indicate your opinion of the following statement for the factors listed (SHOW CARD 53).

“The project structure(s) in our organisation”

	S. Agree	Agree	Neutral	Disagree	S. Disa	D.K.
A. ensures effective management of the project objectives	<input type="checkbox"/>					
B. facilitates multi-functional teamwork with a cross-fertilisation of ideas/information	<input type="checkbox"/>					
C. promotes the sharing of experiences and organisational learning	<input type="checkbox"/>					
D. ensures a cost effective use of resources	<input type="checkbox"/>					
E. ensures the multi-project strategic view is seen on individual projects	<input type="checkbox"/>					
E. ensures the local view is given pre-eminence	<input type="checkbox"/>					
G. makes us more innovative/creative	<input type="checkbox"/>					
F. makes us more flexible/responsive to change	<input type="checkbox"/>					
I. makes us better able to meet customers requirements	<input type="checkbox"/>					
J. Other	<input type="checkbox"/>	<input type="checkbox"/>				

Please specify

54. Is there a structure for the strategic co-ordination of multi-projects?

YES	NO	DON'T KNOW
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
01	02	03

If Yes Please provide details.....

Appendix 3.1 (Cont.)

55. Is there a structure providing centralised support for the management of projects (such as a Project Office or a Project Support/Admin group)?

YES	NO	DON'T KNOW
<input type="text" value="01"/>	<input type="text" value="02"/>	<input type="text" value="03"/>

*** Note to interviewer**
If the answer to Q. 55 is "NO" or "DON'T KNOW" go to Q. 57

56. What functions does the centralised structure carry out (SHOW CARD 56)?

- | | | |
|---|----|----------------------|
| A. A centre for expertise in such areas as planning, estimating | 01 | <input type="text"/> |
| B. Project selection | 02 | <input type="text"/> |
| C. Prioritizing of projects | 03 | <input type="text"/> |
| D. People allocation and assignment | 04 | <input type="text"/> |
| E. Project administration | 05 | <input type="text"/> |
| F. Development of project management processes and procedures | 06 | <input type="text"/> |
| G. Project audits | 07 | <input type="text"/> |
| H. Central repository for project information | 08 | <input type="text"/> |
| I. Project monitoring | 09 | <input type="text"/> |
| J. Project Reporting | 10 | <input type="text"/> |
| K. What if analysis | 11 | <input type="text"/> |
| L. Risk analysis | 12 | <input type="text"/> |
| M. Issue/change management | 13 | <input type="text"/> |
| N. Project management education/training | 14 | <input type="text"/> |
| O. Project review | 15 | <input type="text"/> |
| Other Please specify | 16 | <input type="text"/> |
| P. Don't know | 17 | <input type="text"/> |

Appendix 3.1 (Cont.)

The next section focuses on computerised project management systems used to support the management of projects.

57. Is a computer-based software package used to support the management of projects?

YES	NO	DON'T KNOW
<input type="text" value="01"/>	<input type="text" value="02"/>	<input type="text" value="03"/>

*** Note to interviewer**
If the answer to Q. 57 is "NO" or "DON'T KNOW" go to Q. 60.

58. Which statement best fits the type of system most commonly used (SHOW CARD 58)?

- | | | |
|---|----|----------------------|
| A. A stand-alone PC-based system with features for planning, monitoring, controlling and reporting | 01 | <input type="text"/> |
| B. A stand-alone PC-based system with the above features and, additional features, such risk/what if/performance analysis | 02 | <input type="text"/> |
| C. A centralised mini/mainframe system | 03 | <input type="text"/> |
| D. A PC/networked system integrated with other software packages such as spreadsheets and databases. | 04 | <input type="text"/> |

59. Do you plan/wish to upgrade to another type of system in the future?

Yes	<input type="text" value="01"/>	No	<input type="text" value="02"/>	D. know	<input type="text" value="03"/>
-----	---------------------------------	----	---------------------------------	---------	---------------------------------

If Yes, please supply details

Appendix 3.1 (Cont.)

60. Please indicate your attitude towards the following statements (SHOW CARD 60).

	S. Agree	Agree	Neutral	Disagree	S. Disa	D.K.
A. A common project "language" is shared by all	<input type="checkbox"/>					
B. Project teams are usually brought together to work in close physical proximity to each other	<input type="checkbox"/>					
C. Project information is clearly evident in the work environment (eg charts/pictures)	<input type="checkbox"/>					
D. Project ideas/information is freely shared by all	<input type="checkbox"/>					
E. Project-focused meetings are held in the organisation	<input type="checkbox"/>					
F. Social gatherings & festivities associated with projects are held in the organisation	<input type="checkbox"/>					
G. Open two-way partnerships with customers exist	<input type="checkbox"/>					
H. Open two-way partnerships with suppliers exist	<input type="checkbox"/>					

61. Please indicate your attitude towards the following statements regarding the culture in your organisation (SHOW CARD 61).

	S. Agree	Agree	Neutral	Disagree	S. Disa	D.K.
A. It aims to maintain traditions whilst ensuring effective operation of a hierarchical structure	<input type="checkbox"/>					
B. It encourages harmonious alignment to Common goals	<input type="checkbox"/>					
C. It focuses on innovation with independence of thought and action	<input type="checkbox"/>					
D. It encourages collaboration with an adaptiveness to common solutions	<input type="checkbox"/>					

Appendix 3.1 (Cont.)

Finally I would now like to move away from the project environment and consider some of the areas in which you have witnessed changes in the organisation.

62. Please indicate your opinion of the following statement for the events listed (SHOW CARD 62).

“The following event has had a positive effect on our organisation.....”

	S. Agree	Agree	Neutral	Disagree	S. Disa	D.Know	N.A.
A. TQM Programme	<input type="checkbox"/>						
B. BPR programme	<input type="checkbox"/>						
C. QMS accreditation (such as ISO 9000)	<input type="checkbox"/>						
D. Reduction in management layers	<input type="checkbox"/>						
E. Re-defining of jobs							
F. Employee empowerment policy	<input type="checkbox"/>						
H. Policy of employee involv. in decision making	<input type="checkbox"/>						
I. Policy of recognition for project-related work	<input type="checkbox"/>						
J. Company-wide training in project-related skills	<input type="checkbox"/>						
K. Policy of recognition for developing skills in project-related work	<input type="checkbox"/>						
K. Quality circles/quality teams	<input type="checkbox"/>						
L. Project approach to work	<input type="checkbox"/>						
M. Change in company ownership	<input type="checkbox"/>						
N. Other	<input type="checkbox"/>						

Please specify

Appendix 3.1 (Cont.)

Please indicate your attitude towards how your organisation involves you in the introduction of change (SHOW CARD 63).

	S. Agree	Agree	Neutral	Disagree	S. Disa	D.K.
A. I am made aware of the need for change	<input type="checkbox"/>					
B. I help to define change	<input type="checkbox"/>					
C. I develop change which has been defined at a higher level	<input type="checkbox"/>					
D. Change is handed down by edict for us to implement	<input type="checkbox"/>					
E. Other Please specify	<input type="checkbox"/>					
F. Don't know	<input type="checkbox"/>					

64. *Please indicate your opinion of the following statements relating how successful your organisation is at managing change (SHOW CARD 64).*

	S. Agree	Agree	Neutral	Disagree	S. Disa	D.K.
A. The ideas for change initiated by the organisation are usually good ones	<input type="checkbox"/>					
B. The organisation is poor at implementing potentially good ideas for change	<input type="checkbox"/>					
C. Ideas for change, which do not reflect our needs, originate in groups external to our organisation	<input type="checkbox"/>					
D. Change management programmes are implemented by groups external to our company who don't understand our requirements	<input type="checkbox"/>					

65. *Finally I would like you to think about the likely outcome of an initiative within your organisation to use project management teams, methods and tools more fully.*

What do you think are the main obstacles, if there are any, to such a programme being successful?

.....

.....

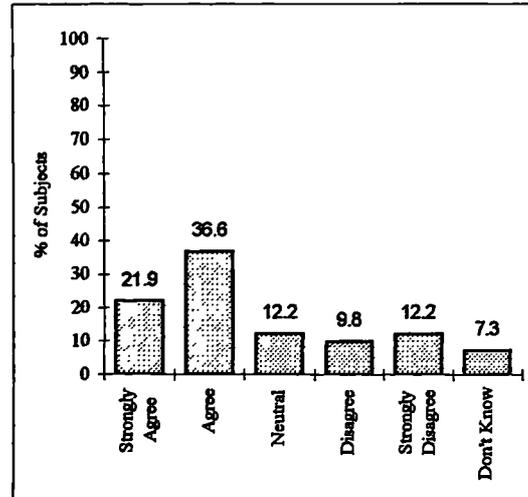
Appendix 4.1: Level of Agreement of Positive Effect of Change Programmes Witnessed – frequency diagrams

a) Total Quality Management Programme

	Percentage	Number
Strongly Agree	21.9	9
Agree	36.6	15
Neutral	12.2	5
Disagree	9.8	4
Strongly Disagree	12.2	5
Don't Know	7.3	3
n =	100.0	41

Not Applicable		21
No Answer		1
Total		63

Mean = 2.50
(calculated excluding "Don't Knows")

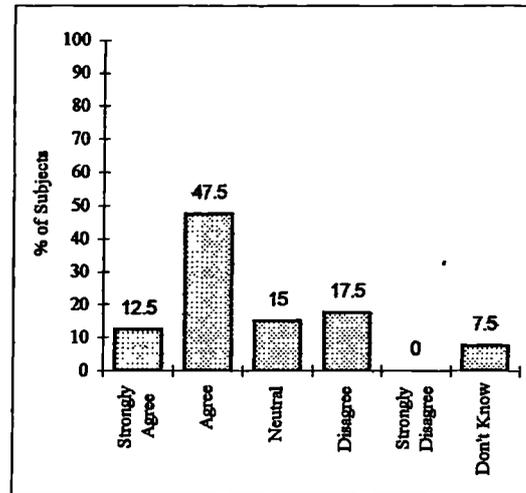


b) Business Process Re-engineering Programme

	Percentage	Number
Strongly Agree	12.5	5
Agree	47.5	19
Neutral	15.0	6
Disagree	17.5	7
Strongly Disagree	0.0	0
Don't Know	7.5	3
n =	100.0	40

Not Applicable		22
No Answer		1
Total		63

Mean = 2.89
(calculated excluding "Don't Knows")

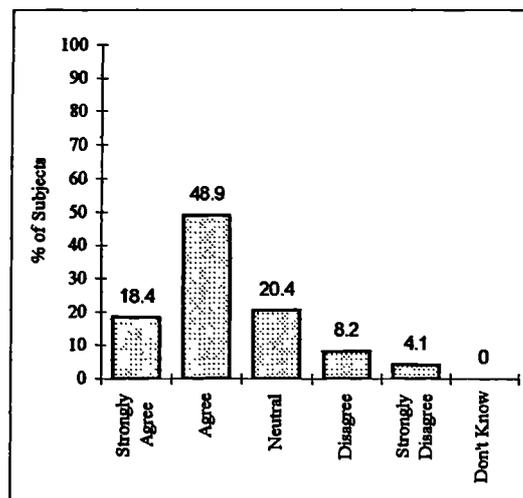


c) Quality Management System Accreditation

	Percentage	Number
Strongly Agree	18.4	9
Agree	48.9	24
Neutral	20.4	10
Disagree	8.2	4
Strongly Disagree	4.1	2
Don't Know	0.0	0
n =	100.0	49

Not Applicable		13
No Answer		1
Total		63

Mean = 2.31
(calculated excluding "Don't Knows")

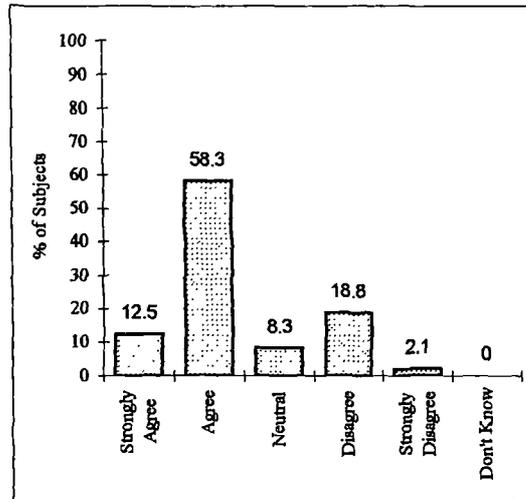


Appendix 4.1 (Cont.)

d) Reduction in management layers

	Percentage	Number
Strongly Agree	12.5	6
Agree	58.3	28
Neutral	8.3	4
Disagree	18.8	9
Strongly Disagree	2.1	1
Don't Know	0.0	0
n =	100.0	48
Not Applicable		14
No Answer		1
Total		63

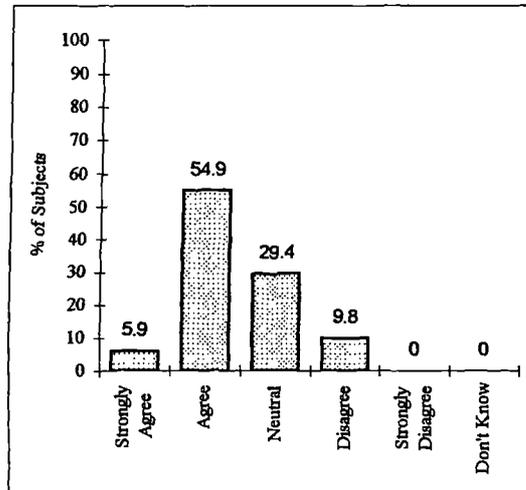
Mean = 2.40
(calculated excluding "Don't Knows")



e) Re-defining of jobs

	Percentage	Number
Strongly Agree	5.9	3
Agree	54.9	28
Neutral	29.4	15
Disagree	9.8	5
Strongly Disagree	0.0	0
Don't Know	0.0	0
n =	100.0	51
Not Applicable		11
No Answer		1
Total		63

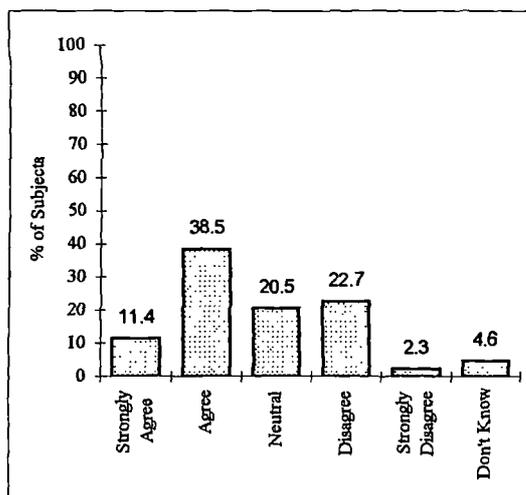
Mean = 2.06
(calculated excluding "Don't Knows")



f) Employee empowerment policy

	Percentage	Number
Strongly Agree	11.4	5
Agree	38.5	17
Neutral	20.5	9
Disagree	22.7	10
Strongly Disagree	2.3	1
Don't Know	4.6	2
n =	100.0	44
Not Applicable		18
No Answer		1
Total		63

Mean = 2.64
(calculated excluding "Don't Knows")



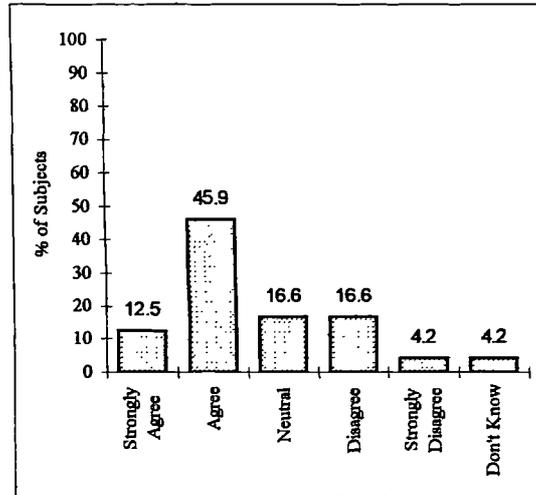
Appendix 4.1 (Cont.)

g) Policy of employee involvement in decision making

	Percentage	Number
Strongly Agree	12.5	6
Agree	45.9	22
Neutral	16.6	8
Disagree	16.6	8
Strongly Disagree	4.2	2
Don't Know	4.2	2
n =	100.0	48

Not Applicable		14
No Answer		1
Total		63

Mean = 2.52
(calculated excluding "Don't Knows")

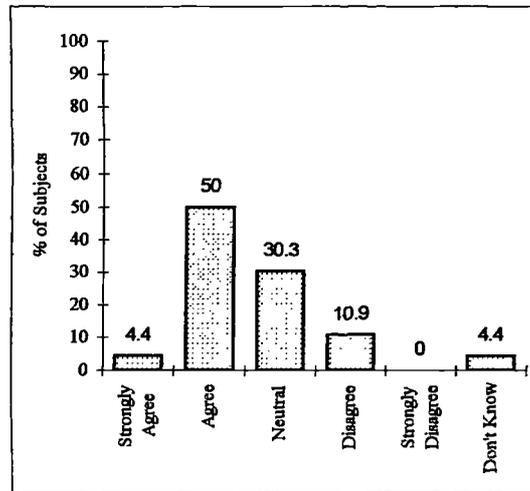


h) Policy of recognition for project-related work

	Percentage	Number
Strongly Agree	4.4	2
Agree	50.0	23
Neutral	30.3	14
Disagree	10.9	5
Strongly Disagree	0.0	0
Don't Know	4.4	2
n =	100.0	46

Not Applicable		16
No Answer		1
Total		63

Mean = 2.50
(calculated excluding "Don't Knows")

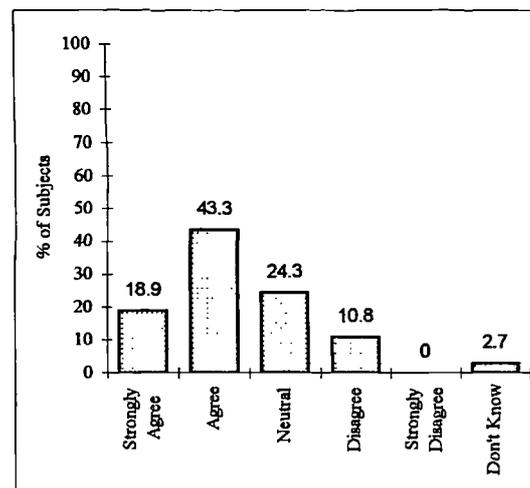


i) Organisation-wide training in project management related skills

	Percentage	Number
Strongly Agree	18.9	7
Agree	43.3	16
Neutral	24.3	9
Disagree	10.8	4
Strongly Disagree	0.0	0
Don't Know	2.7	1
n =	100.0	37

Not Applicable		25
No Answer		1
Total		63

Mean = 2.28
(calculated excluding "Don't Knows")



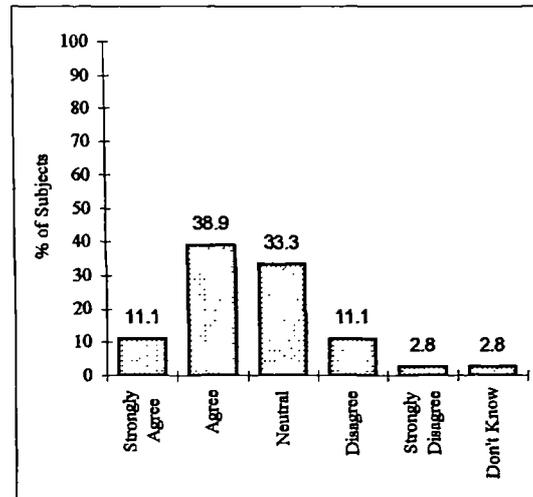
Appendix 4.1 (Cont.)

j) Policy of recognition for developing skills in project-related work

	Percentage	Number
Strongly Agree	11.1	4
Agree	38.9	14
Neutral	33.3	12
Disagree	11.1	4
Strongly Disagree	2.8	1
Don't Know	2.8	1
n =	100.0	36

Not Applicable		26
No Answer		1
Total		63

Mean = 2.54
(calculated excluding "Don't Knows")

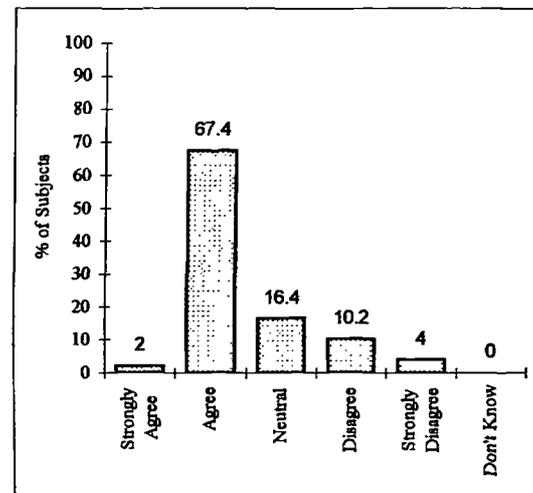


k) Quality Circles/Quality Improvement Teams

	Percentage	Number
Strongly Agree	2.0	1
Agree	67.4	33
Neutral	16.4	8
Disagree	10.2	5
Strongly Disagree	4.0	2
Don't Know	0.0	0
n =	100.0	49

Not Applicable		13
No Answer		1
Total		63

Mean = 2.50
(calculated excluding "Don't Knows")

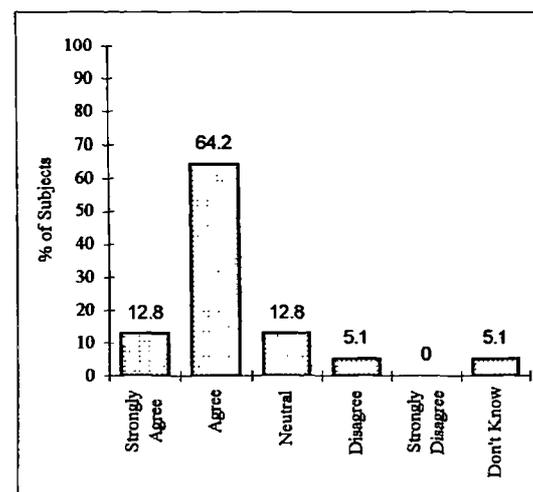


l) Project approach to work

	Percentage	Number
Strongly Agree	12.8	5
Agree	64.2	25
Neutral	12.8	5
Disagree	5.1	2
Strongly Disagree	0.0	0
Don't Know	5.1	2
n =	100.0	39

Not Applicable		23
No Answer		1
Total		63

Mean = 2.11
(calculated excluding "Don't Knows")



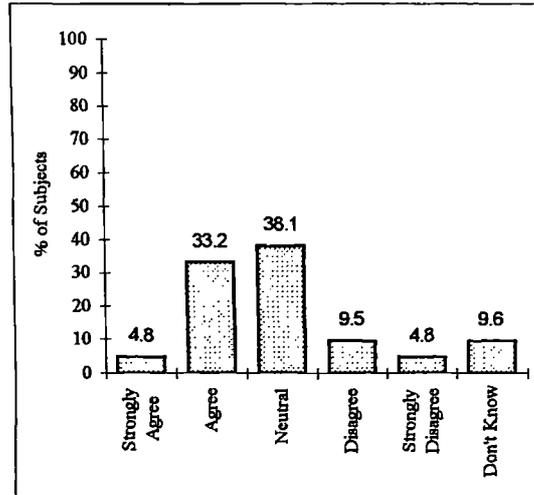
Appendix 4.1 (Cont.)

m) Change in company ownership

	Percentage	Number
Strongly Agree	4.8	1
Agree	33.2	7
Neutral	38.1	8
Disagree	9.5	2
Strongly Disagree	4.8	1
Don't Know	9.6	2
n =	100.0	21

Not Applicable		41
No Answer		1
Total		63

Mean = 2.74
(calculated excluding "Don't Knows")

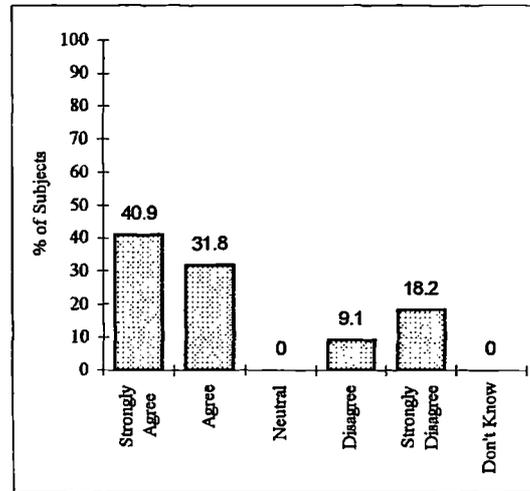


n) Other

	Percentage	Number
Strongly Agree	40.9	9
Agree	31.8	7
Neutral	0.0	0
Disagree	9.1	2
Strongly Disagree	18.2	4
Don't Know	0.0	0
n =	100.0	22

Not Applicable		40
No Answer		1
Total		63

Mean = 2.32
(calculated excluding "Don't Knows")



Appendix 5.1: Factors influencing changes in the use of project management – frequency diagrams

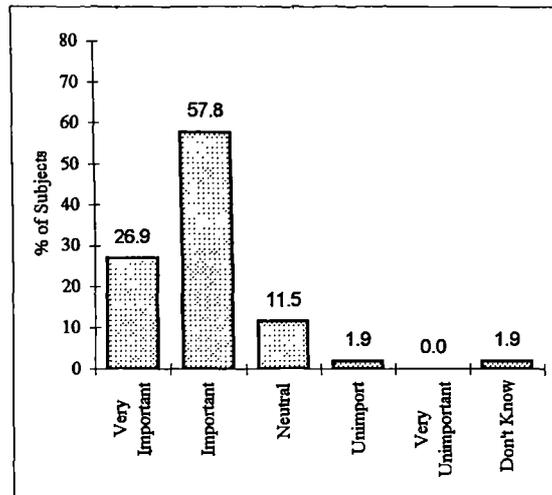
New business strategy

	Percentage	Number
Very Important	26.9	14
Important	57.8	30
Neutral	11.5	6
Unimport	1.9	1
Very Unimportant	0.0	0
Don't Know	1.9	1
n =	100.0	52

No Answer 11

Mean = 1.88

Total 63



Increased competition

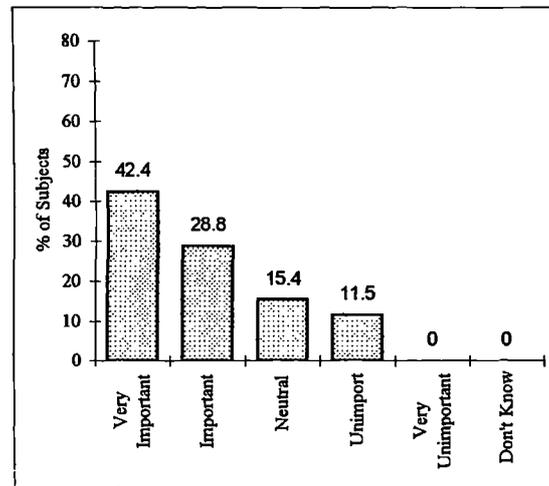
	Percentage	Number
Very Important	42.4	22
Important	28.8	15
Neutral	15.4	8
Unimport	11.5	6
Very Unimportant	0.0	0
Don't Know	0.0	0
n =	98.1	51

Not applicable 1.9 1

No Answer 11

Mean = 1.96

Total 63



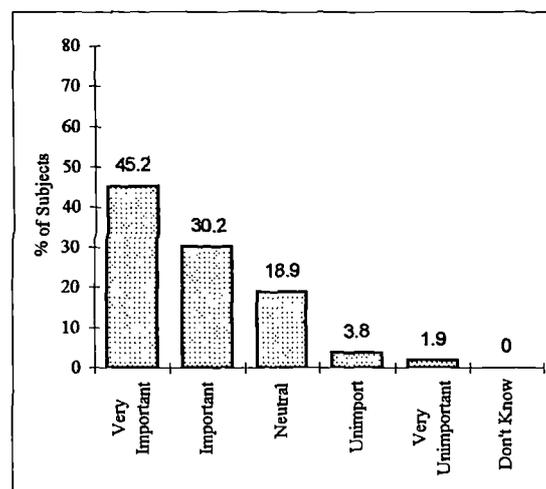
More demanding customer

	Percentage	Number
Very Important	45.2	24
Important	30.2	16
Neutral	18.9	10
Unimport	3.8	2
Very Unimportant	1.9	1
Don't Know	0.0	0
n =	100.0	53

No Answer 10

Mean = 1.86

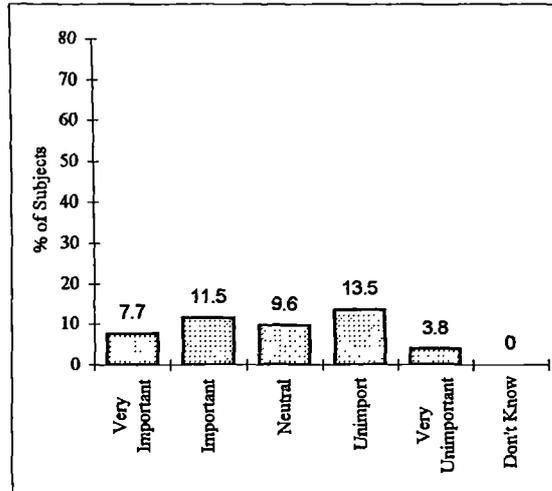
Total 63



Appendix 5.1 (Cont.)

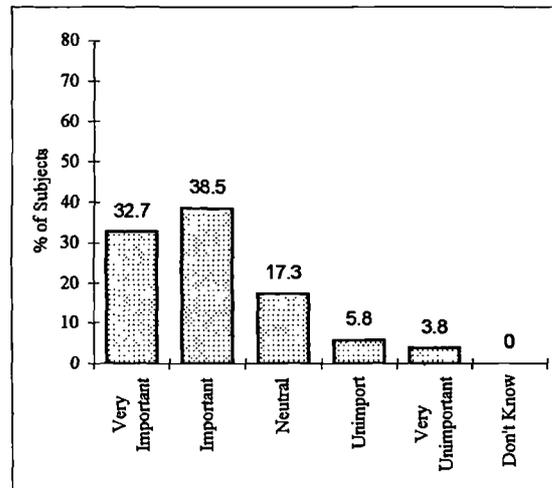
Greenfield venture/re-start

	Percentage	Number
Very Important	7.7	4
Important	11.5	6
Neutral	9.6	5
Unimport	13.5	7
Very Unimportant	3.8	2
Don't Know	0.0	0
n =	46.1	24
Not applicable	53.9	28
No Answer		11
Mean =	2.88	
Total		63



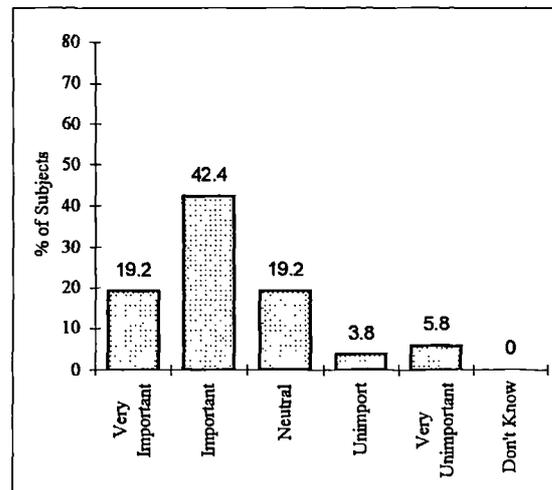
Introduction of new technology

	Percentage	Number
Very Important	32.7	17
Important	38.5	20
Neutral	17.3	9
Unimport	5.8	3
Very Unimportant	3.8	2
Don't Know	0.0	0
n =	98.1	51
Not applicable	1.9	1
No Answer		11
Mean =	2.08	
Total		63



Introduction of new management

	Percentage	Number
Very Important	19.2	10
Important	42.4	22
Neutral	19.2	10
Unimport	3.8	2
Very Unimportant	5.8	3
Don't Know	0.0	0
n =	90.4	47
Not applicable	9.6	5
No Answer		11
Mean =	2.28	
Total		63



Appendix 5.2: Features of Project Environment – frequency diagrams

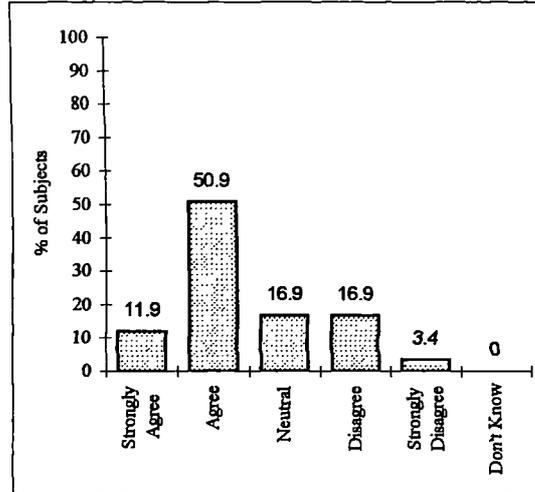
a) Project ideas/information is freely shared by all

	Percentage	Number
Strongly Agree	11.9	7
Agree	50.9	30
Neutral	16.9	10
Disagree	16.9	10
Strongly Disagree	3.4	2
Don't Know	0.0	0
n =	100.0	59

No Answer 4

Total 63

Mean = 2.49
(calculated excluding "Don't Knows")



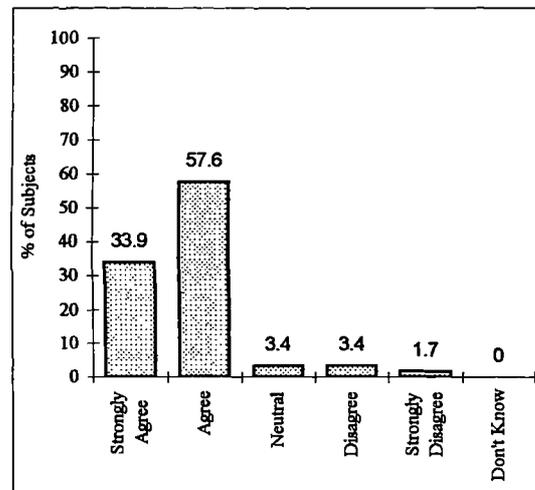
b) Project-focused meetings are held in the organisation

	Percentage	Number
Strongly Agree	33.9	20
Agree	57.6	34
Neutral	3.4	2
Disagree	3.4	2
Strongly Disagree	1.7	1
Don't Know	0.0	0
n =	100.0	59

No Answer 4

Total 63

Mean = 1.81
(calculated excluding "Don't Knows")



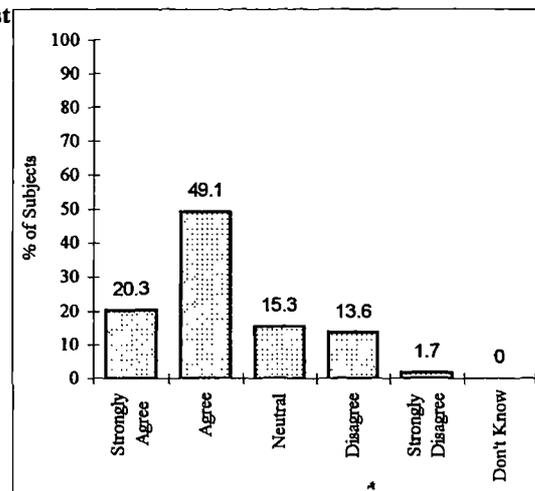
c) Open two-way partnerships with customers exist

	Percentage	Number
Strongly Agree	20.3	12
Agree	49.1	29
Neutral	15.3	9
Disagree	13.6	8
Strongly Disagree	1.7	1
Don't Know	0.0	0
n =	100.0	59

No Answer 4

Total 63

Mean = 2.27
(calculated excluding "Don't Knows")



Appendix 5.2 (Cont.)

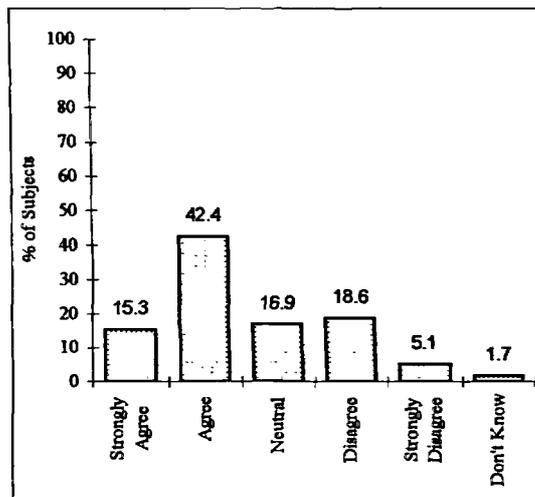
d) Open two-way partnerships with suppliers exist

	Percentage	Number
Strongly Agree	15.3	9
Agree	42.4	25
Neutral	16.9	10
Disagree	18.6	11
Strongly Disagree	5.1	3
Don't Know	1.7	1
n =	100.0	59

No Answer 4

Total 63

Mean = 2.51
(calculated excluding "Don't Knows")



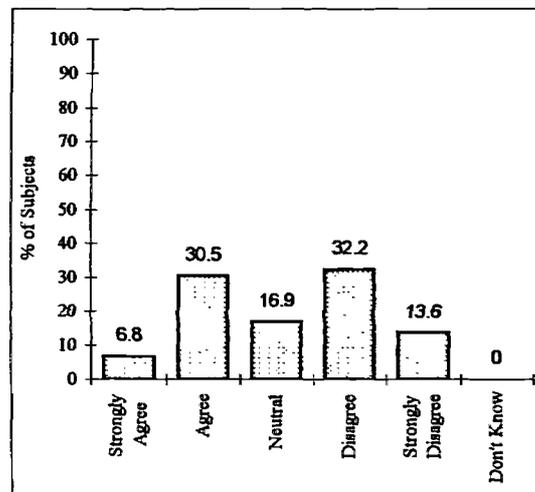
e) Social gatherings & festivities associated with projects are held in the organisation

	Percentage	Number
Strongly Agree	6.8	4
Agree	30.5	18
Neutral	16.9	10
Disagree	32.2	19
Strongly Disagree	13.6	8
Don't Know	0.0	0
n =	100.0	59

No Answer 4

Total 63

Mean = 3.15
(calculated excluding "Don't Knows")



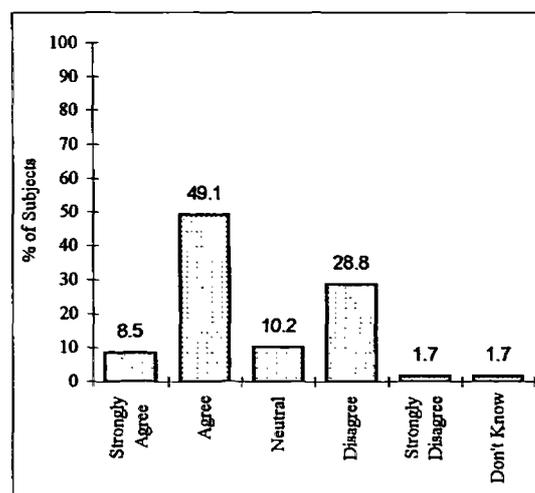
f) A Common project "language" is shared by all

	Percentage	Number
Strongly Agree	8.5	5
Agree	49.1	29
Neutral	10.2	6
Disagree	28.8	17
Strongly Disagree	1.7	1
Don't Know	1.7	1
n =	100.0	59

No Answer 4

Total 63

Mean = 2.61
(calculated excluding "Don't Knows")

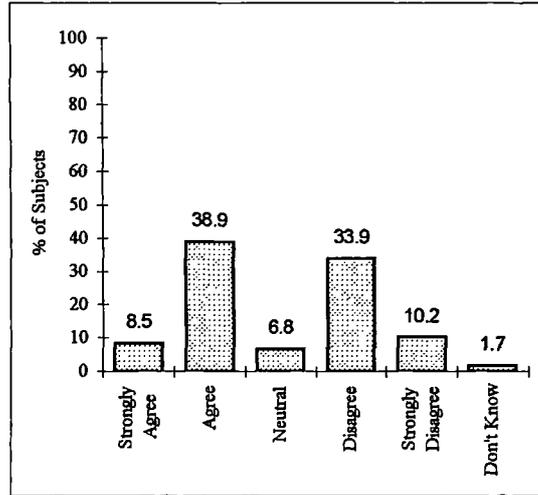


Appendix 5.2 (Cont.)

g) Project teams are usually brought together to work in close physical proximity to each other

	Percentage	Number
Strongly Agree	8.5	5
Agree	38.9	23
Neutral	6.8	4
Disagree	33.9	20
Strongly Disagree	10.2	6
Don't Know	1.7	1
n =	100.0	59
No Answer		4
Total		63

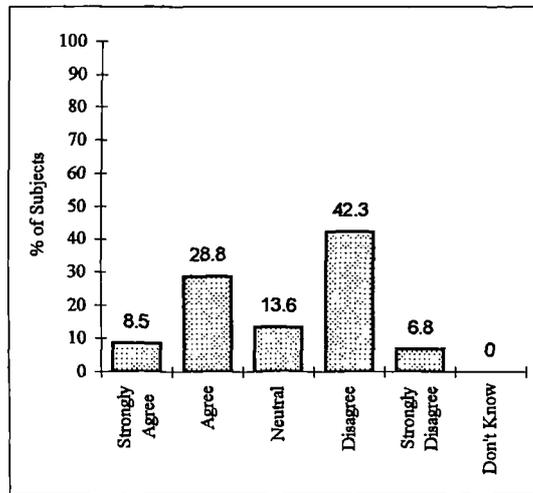
Mean = 2.93
(calculated excluding "Don't Knows")



h) Project information is clearly evident in the work environment (e.g. charts/pictures)

	Percentage	Number
Strongly Agree	8.5	5
Agree	28.8	17
Neutral	13.6	8
Disagree	42.3	25
Strongly Disagree	6.8	4
Don't Know	0.0	0
n =	100.0	59
No Answer		4
Total		63

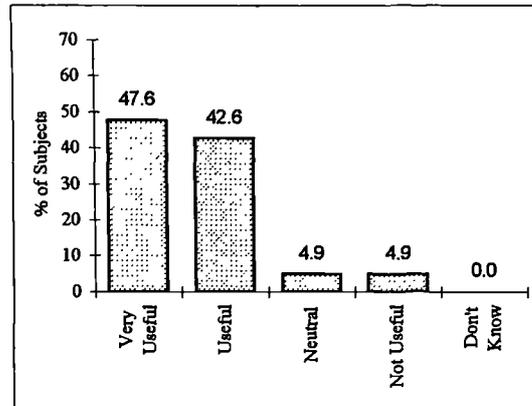
Mean = 3.10
(calculated excluding "Don't Knows")



Appendix 5.3: Current uses of project management – frequency diagrams

Co-ordination of work

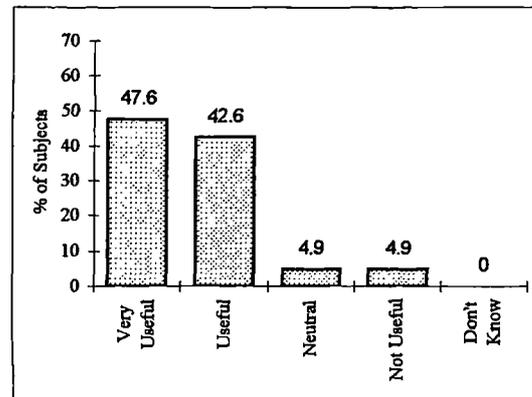
	Percentage	Number
Very Useful	47.6	29
Useful	42.6	26
Neutral	4.9	3
Not Useful	4.9	3
Don't Know	0.0	0
n =	100.0	61
No Answer		2
Total		63



Mean = 1.68
(calculated excluding "Don't Knows")

Coordination of resources

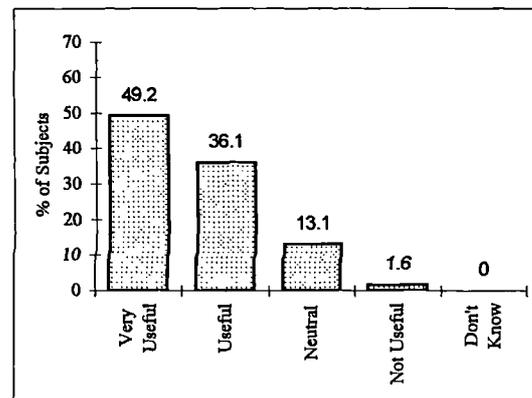
	Percentage	Number
Very Useful	47.6	27
Useful	42.6	19
Neutral	4.9	11
Not Useful	4.9	4
Don't Know	0.0	0
n =	100.0	61
No Answer		2
Total		63



Mean = 1.86
(calculated excluding "Don't Knows")

Meeting time project objectives

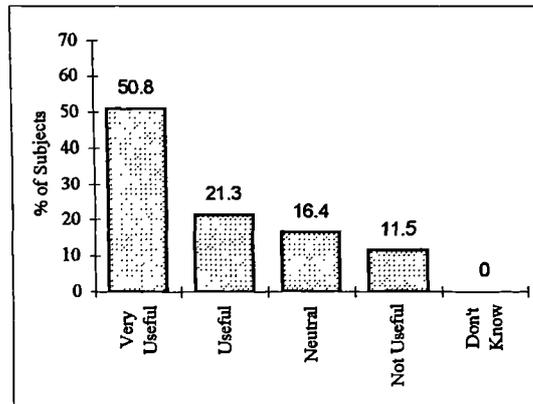
	Percentage	Number
Very Useful	49.2	30
Useful	36.1	22
Neutral	13.1	8
Not Useful	1.6	1
Don't Know	0.0	0
n =	100.0	61
No Answer		2
Total		63



Appendix 5.3 (Cont.)

Meeting cost project objectives

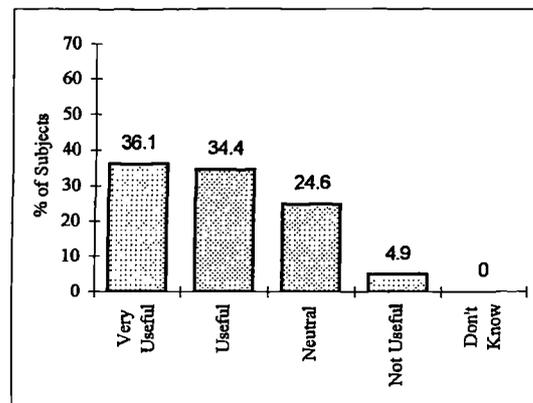
	Percentage	Number
Very Useful	50.8	31
Useful	21.3	13
Neutral	16.4	10
Not Useful	11.5	7
Don't Know	0.0	0
n =	100.0	61
No Answer		2
Total		63



Mean = 1.89
(calculated excluding "Don't Knows")

Meeting quality objectives

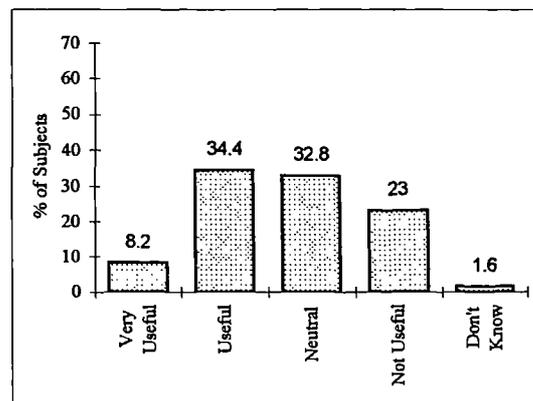
	Percentage	Number
Very Useful	36.1	22
Useful	34.4	21
Neutral	24.6	15
Not Useful	4.9	3
Don't Know	0.0	0
n =	100.0	61
No Answer		2
Total		63



Mean = 1.98
(calculated excluding "Don't Knows")

Facilitating innovation

	Percentage	Number
Very Useful	8.2	5
Useful	34.4	21
Neutral	32.8	20
Not Useful	23.0	14
Don't Know	1.6	1
n =	100.0	61
No Answer		2
Total		63



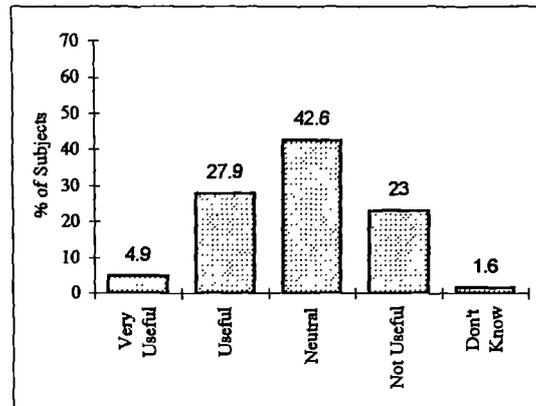
Appendix 5.3 (Cont.)

Facilitating creativity

	Percentage	Number
Very Useful	4.9	3
Useful	27.9	17
Neutral	42.6	26
Not Useful	23.0	14
Don't Know	1.6	1
n =	100.0	61

No Answer 2

Total 63



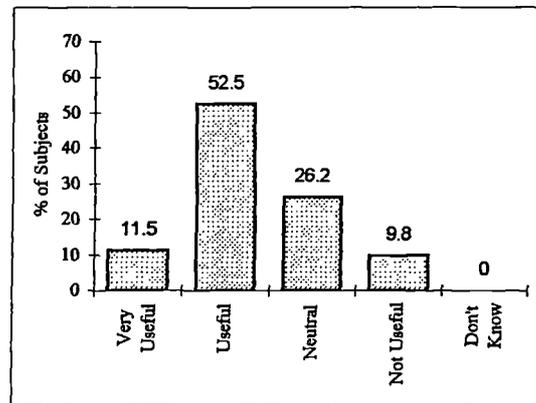
Mean = 2.85
(calculated excluding "Don't Knows")

Building new knowledge

	Percentage	Number
Very Useful	11.5	7
Useful	52.5	32
Neutral	26.2	16
Not Useful	9.8	6
Don't Know	0.0	0
n =	100.0	61

No Answer 2

Total 63



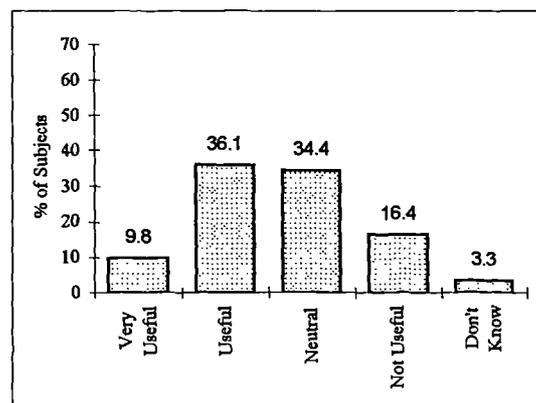
Mean = 2.34
(calculated excluding "Don't Knows")

Eliminating competing ideas

	Percentage	Number
Very Useful	9.8	6
Useful	36.1	22
Neutral	34.4	21
Not Useful	16.4	10
Don't Know	3.3	2
n =	100.0	61

No Answer 2

Total 63

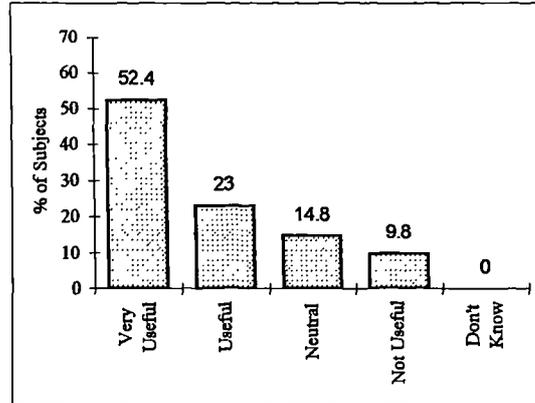


Mean = 2.59
(calculated excluding "Don't Knows")

Appendix 5.3 (Cont.)

Prioritising work

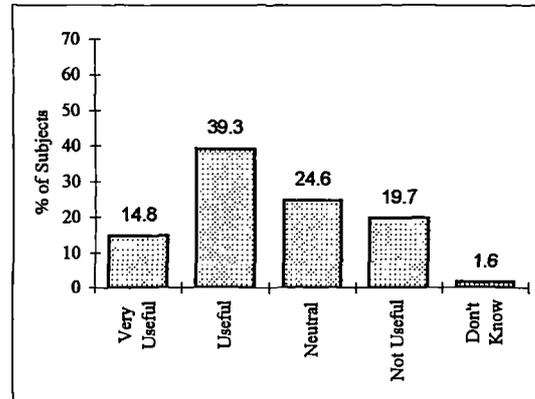
	Percentage	Number
Very Useful	52.4	32
Useful	23.0	14
Neutral	14.8	9
Not Useful	9.8	6
Don't Know	0.0	0
n =	100.0	61
No Answer		2
Total		63



Mean = 1.82
(calculated excluding "Don't Knows")

Firefighting/resolving crises

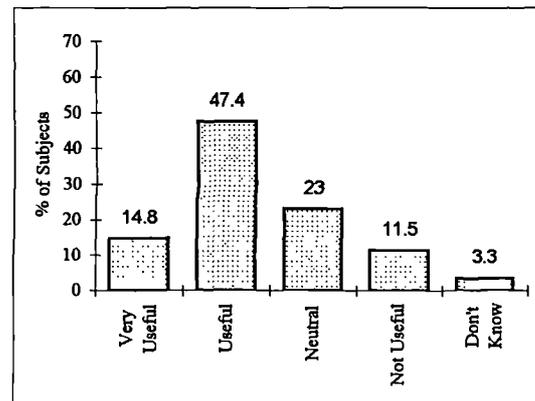
	Percentage	Number
Very Useful	14.8	9
Useful	39.3	24
Neutral	24.6	15
Not Useful	19.7	12
Don't Know	1.6	1
n =	100.0	61
No Answer		2
Total		63



Mean = 2.5
(calculated excluding "Don't Knows")

Setting new product/service specifications

	Percentage	Number
Very Useful	14.8	9
Useful	47.4	29
Neutral	23.0	14
Not Useful	11.5	7
Don't Know	3.3	2
n =	100.0	61
No Answer		2
Total		63

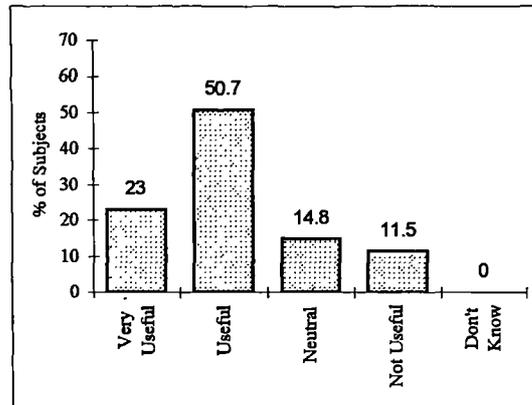


Mean = 2.32
(calculated excluding "Don't Knows")

Appendix 5.3 (Cont.)

Controlling management processes

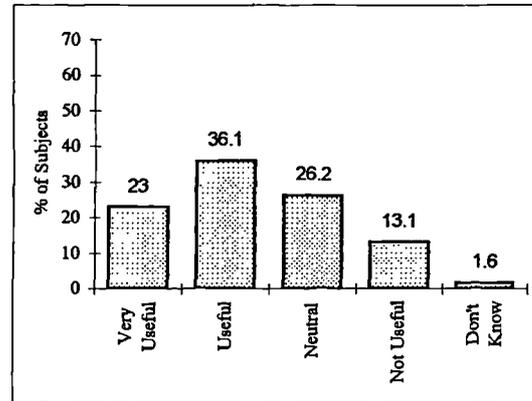
	Percentage	Number
Very Useful	23.0	14
Useful	50.7	31
Neutral	14.8	9
Not Useful	11.5	7
Don't Know	0.0	0
n =	100.0	61
No Answer		2
Total		63



Mean = 2.15
(calculated excluding "Don't Knows")

Ident./resolution of business related issues

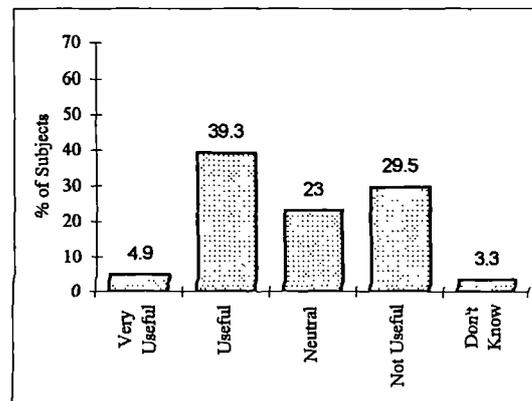
	Percentage	Number
Very Useful	23.0	14
Useful	36.1	22
Neutral	26.2	16
Not Useful	13.1	8
Don't Know	1.6	1
n =	100.0	61
No Answer		2
Total		63



Mean = 2.3
(calculated excluding "Don't Knows")

Measurement of continuous improvement

	Percentage	Number
Very Useful	4.9	3
Useful	39.3	24
Neutral	23.0	14
Not Useful	29.5	18
Don't Know	3.3	2
n =	100.0	61
No Answer		2
Total		63

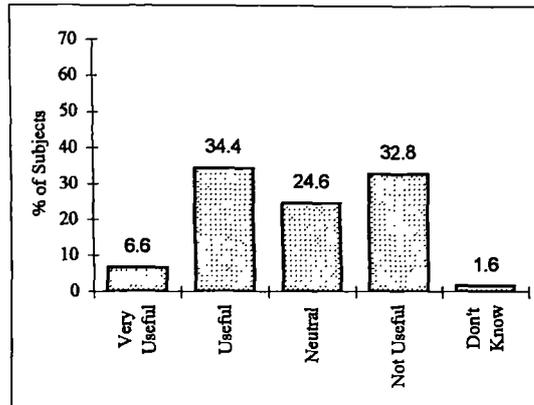


Mean = 2.8
(calculated excluding "Don't Knows")

Appendix 5.3 (Cont.)

Management of continuous improvement

	Percentage	Number
Very Useful	6.6	4
Useful	34.4	21
Neutral	24.6	15
Not Useful	32.8	20
Don't Know	1.6	1
n =	100.0	61
No Answer		2
Total		63

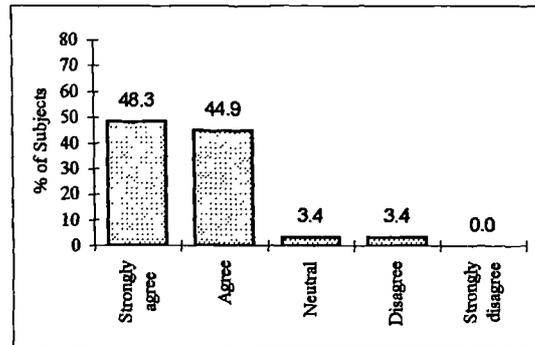


Mean = 2.78
(calculated excluding "Don't Knows")

Appendix 5.4: Anticipated Benefits from the Use of Project Management - frequency diagrams

Helping us survive as a business

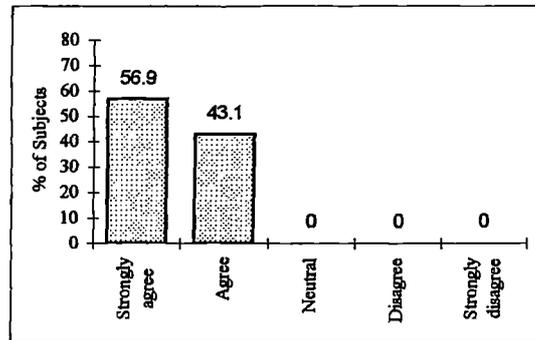
	Percentage	Number
Strongly agree	48.3	28
Agree	44.9	26
Neutral	3.4	2
Disagree	3.4	2
Strongly disagree	0.0	0
n =	100.0	58
No Answer		5
Total		63



Mean = 1.62

Enabling us to better meet customer requirements

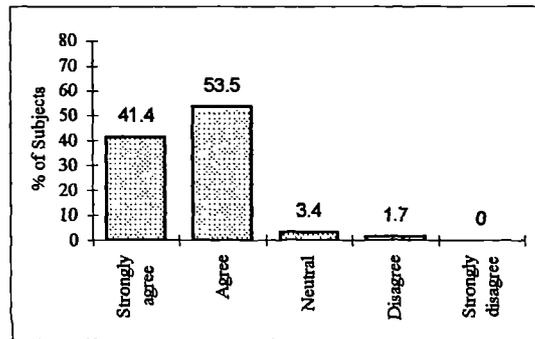
	Percentage	Number
Strongly agree	56.9	33
Agree	43.1	25
Neutral	0.0	0
Disagree	0.0	0
Strongly disagree	0.0	0
n =	100.0	58
No Answer		5
Total		63



Mean = 1.43

Cut costs whilst maintaining quality levels

	Percentage	Number
Strongly agree	41.4	24
Agree	53.5	31
Neutral	3.4	2
Disagree	1.7	1
Strongly disagree	0	0
n =	100.0	58
No Answer		5
Total		63

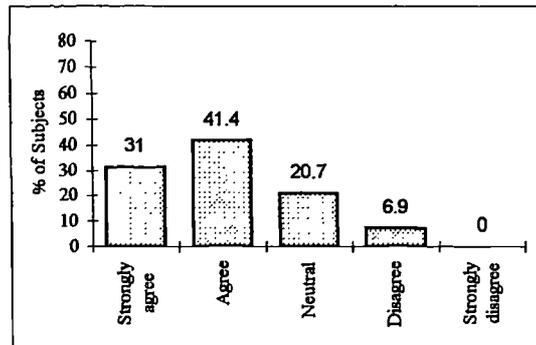


Mean = 1.66

Appendix 5.4 (Cont.)

Reducing time-to-market

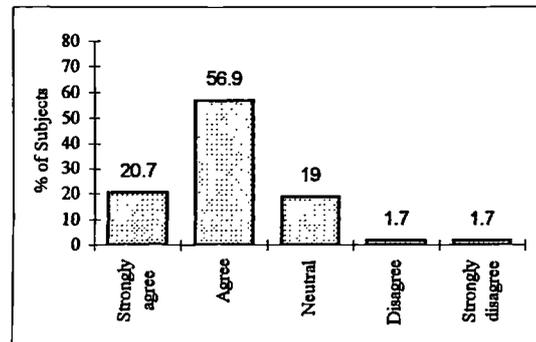
	Percentage	Number
Strongly agree	31.0	18
Agree	41.4	24
Neutral	20.7	12
Disagree	6.9	4
Strongly disagree	0.0	0
n =	100.0	58
No Answer		5
Total		63



Mean = 2.03

Increasing Output With Same Resources

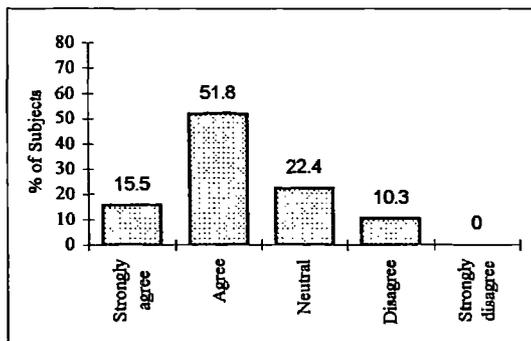
	Percentage	Number
Strongly agree	20.7	12
Agree	56.9	33
Neutral	19.0	11
Disagree	1.7	1
Strongly disagree	1.7	1
n =	100.0	58
No Answer		5
Total		63



Mean = 2.07

Being More Innovative/Creative

	Percentage	Number
Strongly agree	15.5	9
Agree	51.8	30
Neutral	22.4	13
Disagree	10.3	6
Strongly disagree	0.0	0
n =	100.0	58
No Answer		5
Total		63

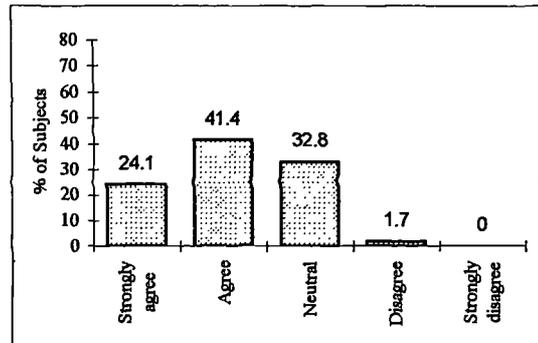


Mean = 2.28

Appendix 5.4 (Cont.)

Providing better overview of strategy

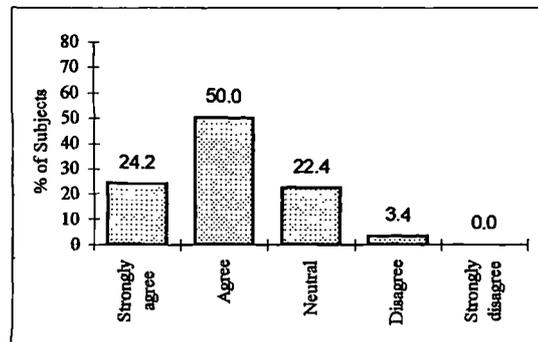
	Percentage	Number
Strongly agree	24.1	14
Agree	41.4	24
Neutral	32.8	19
Disagree	1.7	1
Strongly disagree	0.0	0
n =	100.0	58
No Answer		5
Total		63



Mean = 2.12

A way of managing organisational change

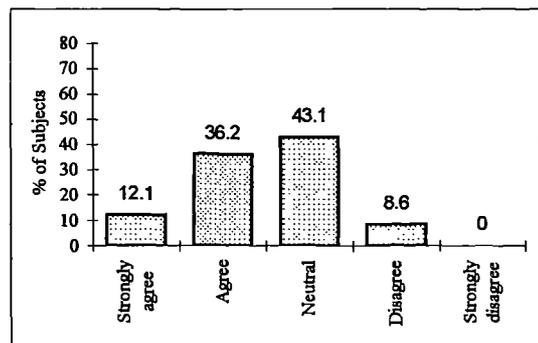
	Percentage	Number
Strongly agree	24.2	14
Agree	50.0	29
Neutral	22.4	13
Disagree	3.4	2
Strongly disagree	0.0	0
n =	100.0	58
No Answer		5
Total		63



Mean = 2.10

Breaking down hostility to organisational change

	Percentage	Number
Strongly agree	12.1	7
Agree	36.2	21
Neutral	43.1	25
Disagree	8.6	5
Strongly disagree	0.0	0
n =	100.0	58
No Answer		5
Total		63

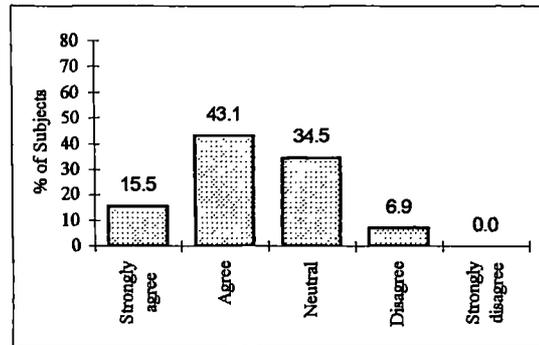


Mean = 2.48

Appendix 5.4 (Cont.)

Enhancing career opportunities

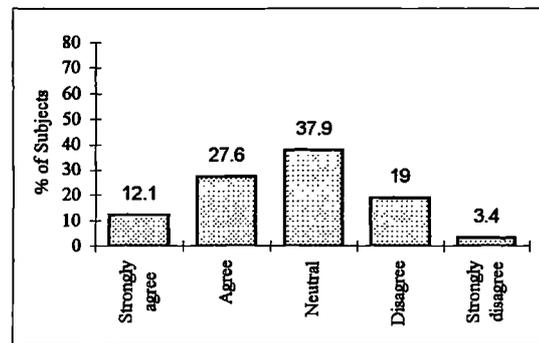
	Percentage	Number
Strongly agree	15.5	9
Agree	43.1	25
Neutral	34.5	20
Disagree	6.9	4
Strongly disagree	0.0	0
n =	100.0	58
No Answer		5
Total		63



Mean = 2.34

Aligning reward/recognition systems to work carried out

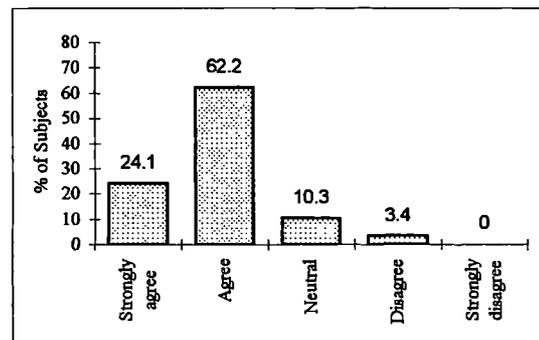
	Percentage	Number
Strongly agree	12.1	7
Agree	27.6	16
Neutral	37.9	22
Disagree	19.0	11
Strongly disagree	3.4	2
n =	100.0	58
No Answer		5
Total		63



Mean = 2.74

Increasing responsibility for work carried out

	Percentage	Number
Strongly agree	24.1	14
Agree	62.2	36
Neutral	10.3	6
Disagree	3.4	2
Strongly disagree	0.0	0
n =	100.0	58
No Answer		5
Total		63

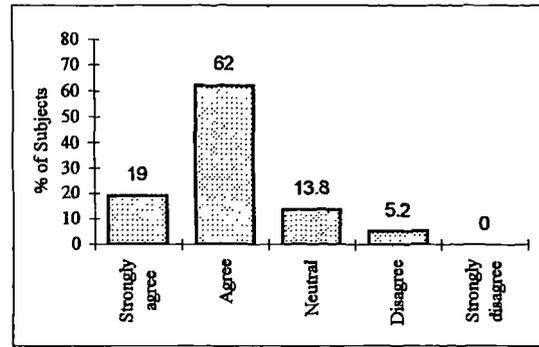


Mean = 1.93

Appendix 5.4 (Cont.)

Aligning desired skills/behaviour to work

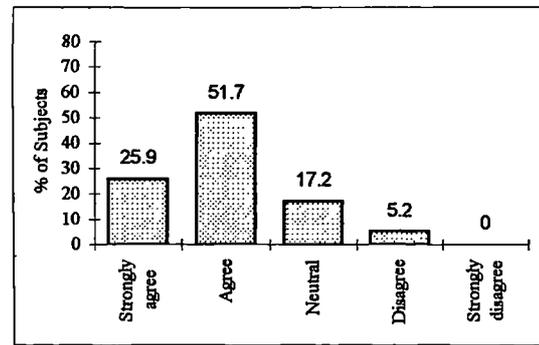
	Percentage	Number
Strongly agree	19.0	11
Agree	62.0	36
Neutral	13.8	8
Disagree	5.2	3
Strongly disagree	0.0	0
n =	100.0	58
No Answer		5
Total		63



Mean = 2.05

Making employees more motivated

	Percentage	Number
Strongly agree	25.9	15
Agree	51.7	30
Neutral	17.2	10
Disagree	5.2	3
Strongly disagree	0.0	0
n =	100.0	58
No Answer		5
Total		63



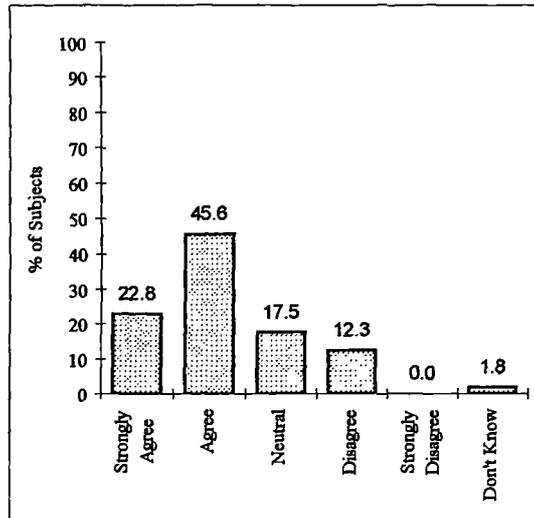
Mean = 2.02

Appendix 6.1: Perceived Benefits of Project Structures – frequency diagrams

Ensures effective management of the project objectives

	Percentage	Number
Strongly Agree	22.8	13
Agree	45.6	26
Neutral	17.5	10
Disagree	12.3	7
Strongly Disagree	0.0	0
Don't Know	1.8	1
n =	100.0	57
No Answer		6
Total		63

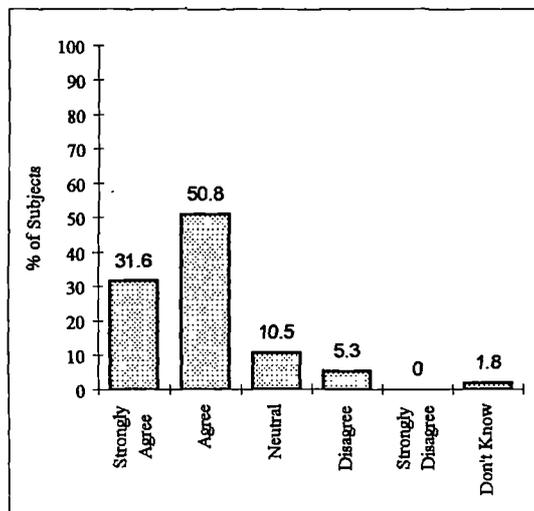
Mean = 2.16
(calculated excluding "Don't Knows")



Facilitates multi-functional teamwork with a cross-fertilisation of ideas/information

	Percentage	Number
Strongly Agree	31.6	18
Agree	50.8	29
Neutral	10.5	6
Disagree	5.3	3
Strongly Disagree	0.0	0
Don't Know	1.8	1
n =	100.0	57
No Answer		6
Total		63

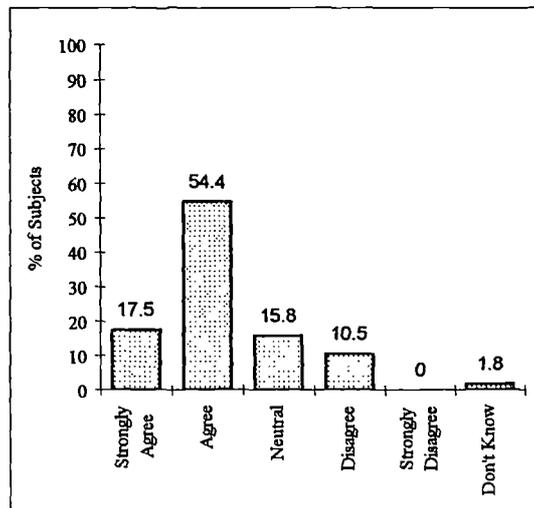
Mean = 1.86
(calculated excluding "Don't Knows")



Promotes the sharing of experiences and organisational learning

	Percentage	Number
Strongly Agree	17.5	10
Agree	54.4	31
Neutral	15.8	9
Disagree	10.5	6
Strongly Disagree	0.0	0
Don't Know	1.8	1
n =	100.0	57
No Answer		6
Total		63

Mean = 2.16
(calculated excluding "Don't Knows")



Appendix 6.1 (Cont.)

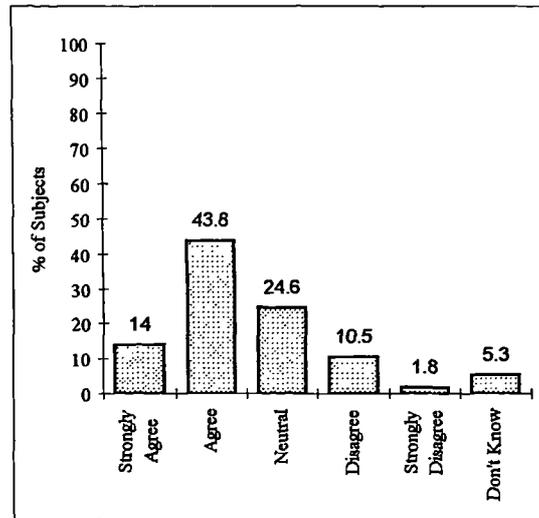
Ensures a cost effective use of resources

	Percentage	Number
Strongly Agree	14.0	8
Agree	43.8	25
Neutral	24.6	14
Disagree	10.5	6
Strongly Disagree	1.8	1
Don't Know	5.3	3
n =	100.0	57

No Answer 6

Total 63

Mean = 2.26
(calculated excluding "Don't Knows")



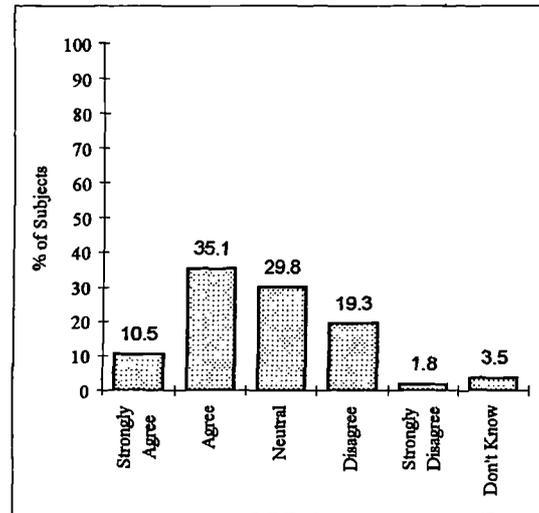
Ensures the multi-project strategic view is seen on individual projects

	Percentage	Number
Strongly Agree	10.5	6
Agree	35.1	20
Neutral	29.8	17
Disagree	19.3	11
Strongly Disagree	1.8	1
Don't Know	3.5	2
n =	100.0	57

No Answer 6

Total 63

Mean = 2.56
(calculated excluding "Don't Knows")



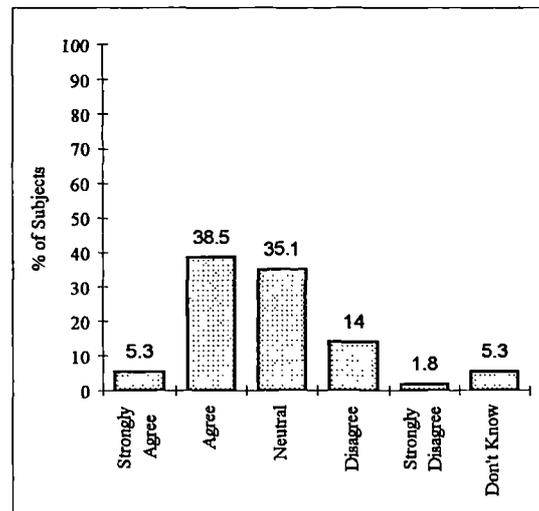
Ensures the local view is given pre-eminence

	Percentage	Number
Strongly Agree	5.3	3
Agree	38.5	22
Neutral	35.1	20
Disagree	14.0	8
Strongly Disagree	1.8	1
Don't Know	5.3	3
n =	100.0	57

No Answer 6

Total 63

Mean = 2.53
(calculated excluding "Don't Knows")

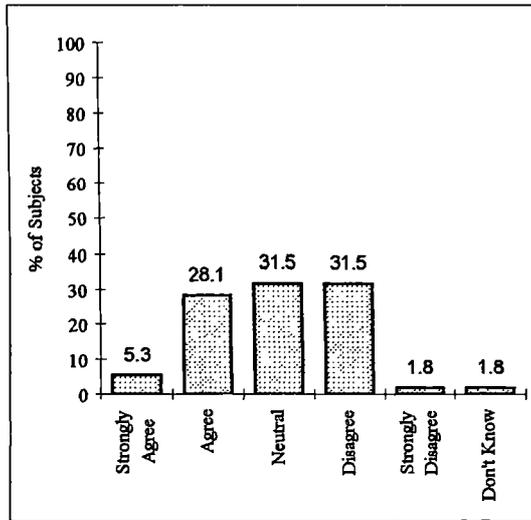


Appendix 6.1 (Cont.)

Makes us more innovative/creative

	Percentage	Number
Strongly Agree	5.3	3
Agree	28.1	16
Neutral	31.5	18
Disagree	31.5	18
Strongly Disagree	1.8	1
Don't Know	1.8	1
n =	100.0	57
No Answer		6
Total		63

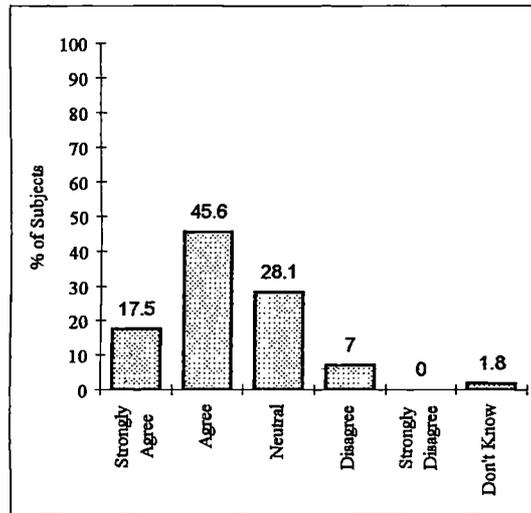
Mean = 2.91
(calculated excluding "Don't Knows")



Makes us more flexible/responsive to change

	Percentage	Number
Strongly Agree	17.5	10
Agree	45.6	26
Neutral	28.1	16
Disagree	7.0	4
Strongly Disagree	0.0	0
Don't Know	1.8	1
n =	100.0	57
No Answer		6
Total		63

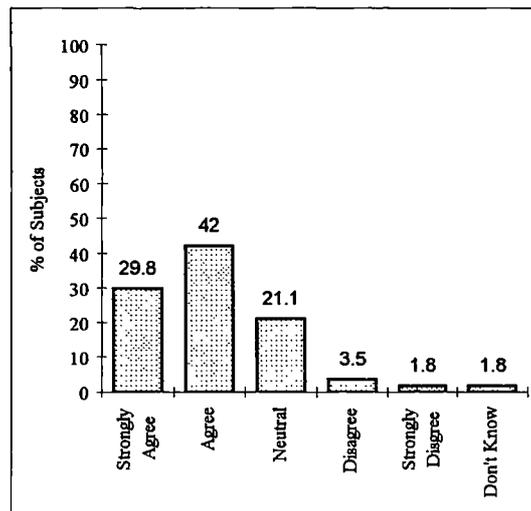
Mean = 2.21
(calculated excluding "Don't Knows")



Makes us better able to meet customers requirements

	Percentage	Number
Strongly Agree	29.8	17
Agree	42.0	24
Neutral	21.1	12
Disagree	3.5	2
Strongly Disagree	1.8	1
Don't Know	1.8	1
n =	100.0	57
No Answer		6
Total		63

Mean = 2.00
(calculated excluding "Don't Knows")



Appendix 7.1: Importance of Project Success Criteria – frequency diagrams

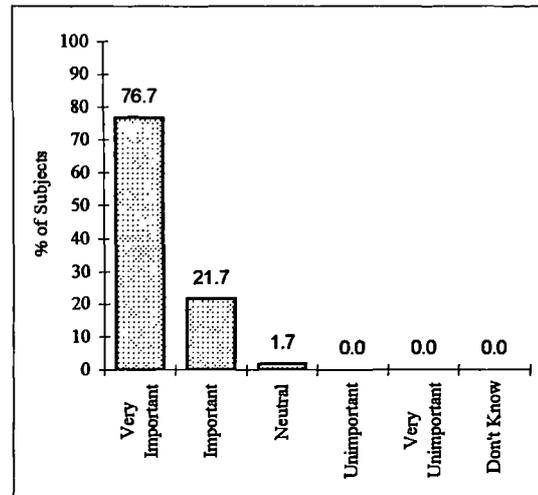
Meeting specified project objectives

	Percentage	Number
Very Important	76.7	46
Important	21.7	13
Neutral	1.7	1
Unimportant	0.0	0
Very Unimportant	0.0	0
Don't Know	0.0	0
n =	100.1	60

No Answer 3

Total 63

Mean = 1.25
(calculated excluding "Don't Knows")



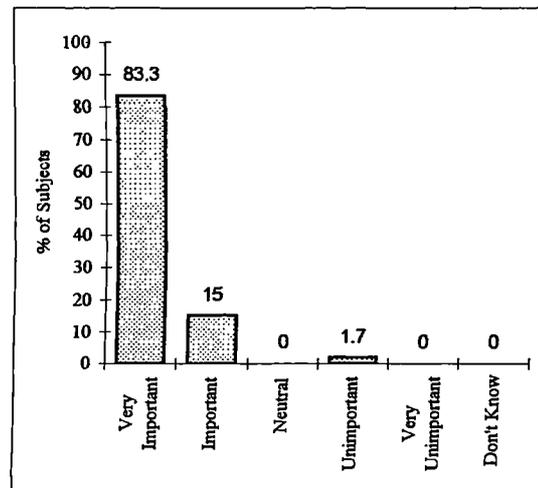
Client perception

	Percentage	Number
Very Important	83.3	50
Important	15.0	9
Neutral	0.0	0
Unimportant	1.7	1
Very Unimportant	0.0	0
Don't Know	0.0	0
n =	100.0	60

No Answer 3

Total 63

Mean = 1.20
(calculated excluding "Don't Knows")



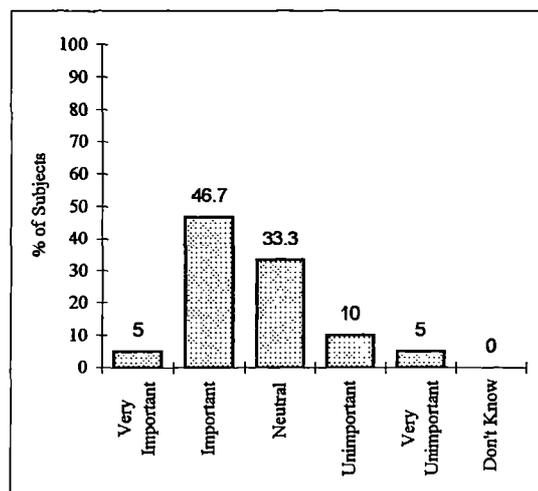
Degree of product/process innovation

	Percentage	Number
Very Important	5.0	3
Important	46.7	28
Neutral	33.3	20
Unimportant	10.0	6
Very Unimportant	5.0	3
Don't Know	0.0	0
n =	100.0	60

No Answer 3

Total 63

Mean = 2.63
(calculated excluding "Don't Knows")



Appendix 7.1 (Cont.)

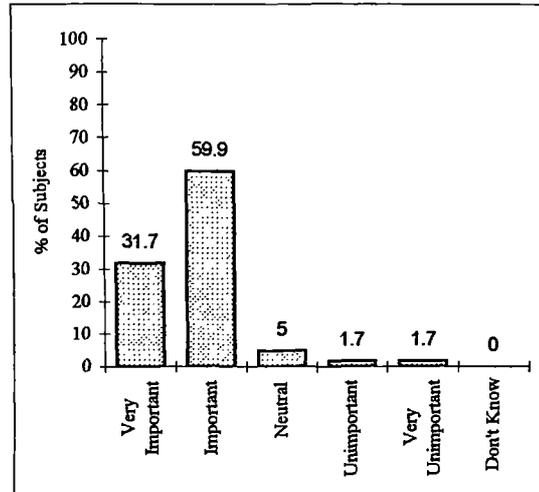
Cost effectiveness of work

	Percentage	Number
Very Important	31.7	19
Important	59.9	36
Neutral	5.0	3
Unimportant	1.7	1
Very Unimportant	1.7	1
Don't Know	0.0	0
n =	100.0	60

No Answer 3

Total 63

Mean = 1.82
(calculated excluding "Don't Knows")



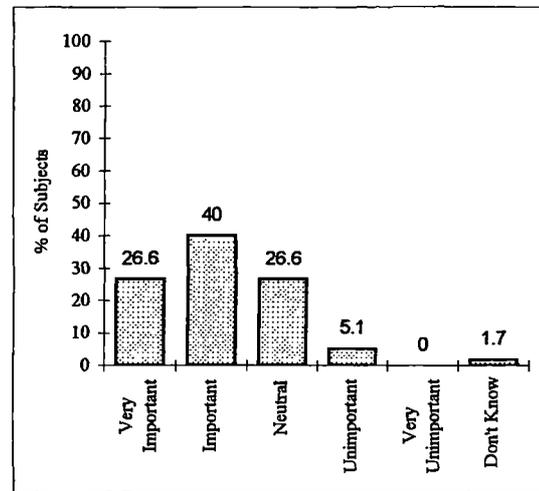
Level of disruption

	Percentage	Number
Very Important	26.6	16
Important	40.0	24
Neutral	26.6	16
Unimportant	5.1	3
Very Unimportant	0.0	0
Don't Know	1.7	1
n =	100.0	60

No Answer 3

Total 63

Mean = 2.10
(calculated excluding "Don't Knows")



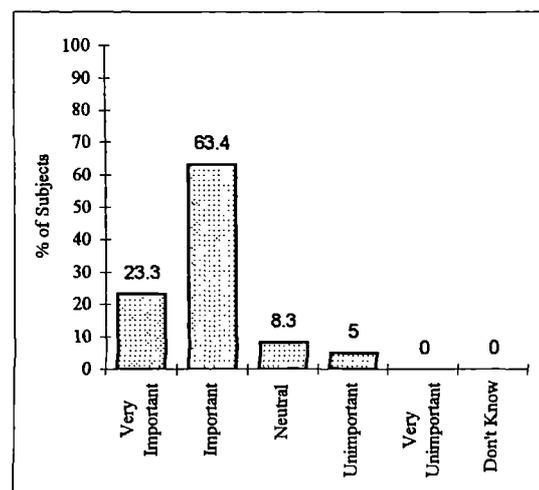
Improvement in organisational capability

	Percentage	Number
Very Important	23.3	14
Important	63.4	38
Neutral	8.3	5
Unimportant	5.0	3
Very Unimportant	0.0	0
Don't Know	0.0	0
n =	100.0	60

No Answer 3

Total 63

Mean = 1.95
(calculated excluding "Don't Knows")



Appendix 7.1 (Cont.)

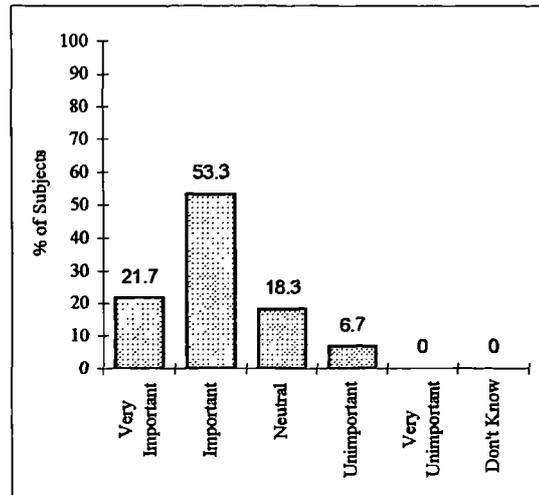
Own personal growth

	Percentage	Number
Very Important	21.7	13
Important	53.3	32
Neutral	18.3	11
Unimportant	6.7	4
Very Unimportant	0.0	0
Don't Know	0.0	0
n =	100.0	60

No Answer 3

Total 63

Mean = 2.10
(calculated excluding "Don't Knows")



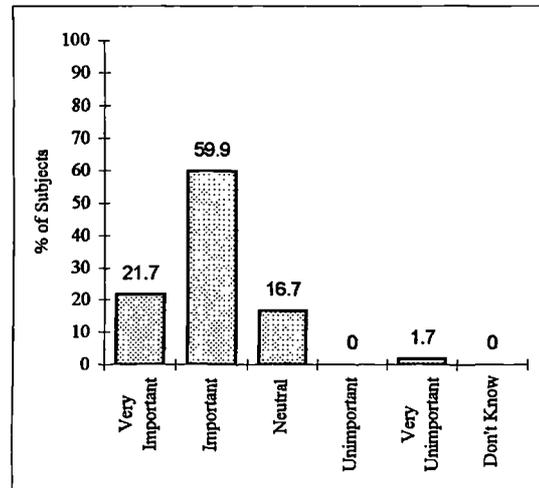
Growth of others

	Percentage	Number
Very Important	21.7	13
Important	59.9	36
Neutral	16.7	10
Unimportant	0.0	1
Very Unimportant	1.7	0
Don't Know	0.0	0
n =	100.0	60

No Answer 3

Total 63

Mean = 2.00
(calculated excluding "Don't Knows")



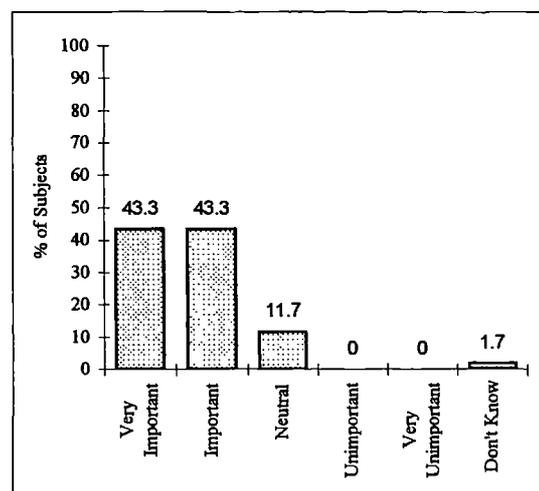
Responsiveness to change

	Percentage	Number
Very Important	43.3	26
Important	43.3	26
Neutral	11.7	7
Unimportant	0.0	0
Very Unimportant	0.0	0
Don't Know	1.7	1
n =	100.0	60

No Answer 3

Total 63

Mean = 1.75
(calculated excluding "Don't Knows")



Appendix 7.1 (Cont.)

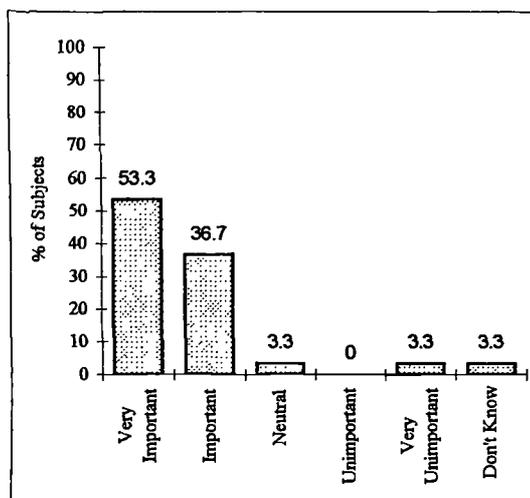
Smoothness of handover

	Percentage	Number
Very Important	53.3	32
Important	36.7	22
Neutral	3.3	2
Unimportant	0.0	0
Very Unimportant	3.3	2
Don't Know	3.3	2
n =	99.9	60

No Answer 3

Total 63

Mean = 1.53
(calculated excluding "Don't Knows")



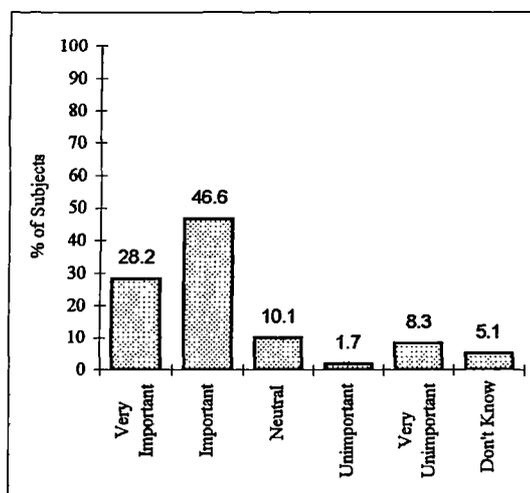
Avoidance of non-benefit/unnecessary cost (through early cancellation)

	Percentage	Number
Very Important	28.2	17
Important	46.6	28
Neutral	10.1	6
Unimportant	1.7	1
Very Unimportant	8.3	5
Don't Know	5.1	3
n =	100.0	60

No Answer 3

Total 63

Mean = 2.00
(calculated excluding "Don't Knows")



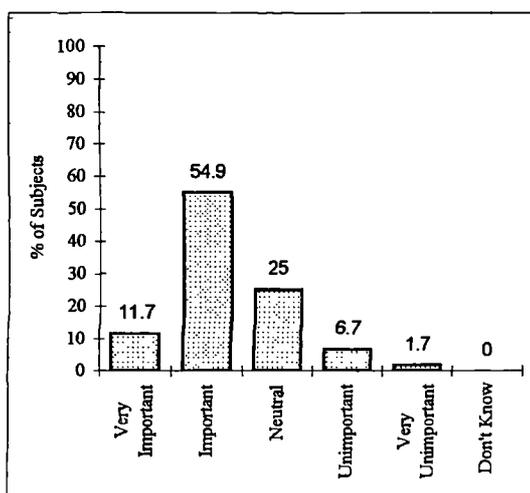
Adherence to defined procedures

	Percentage	Number
Very Important	11.7	7
Important	54.9	33
Neutral	25.0	15
Unimportant	6.7	4
Very Unimportant	1.7	1
Don't Know	0.0	0
n =	100.0	60

No Answer 3

Total 63

Mean = 2.31
(calculated excluding "Don't Knows")



Appendix 7.1 (Cont.)

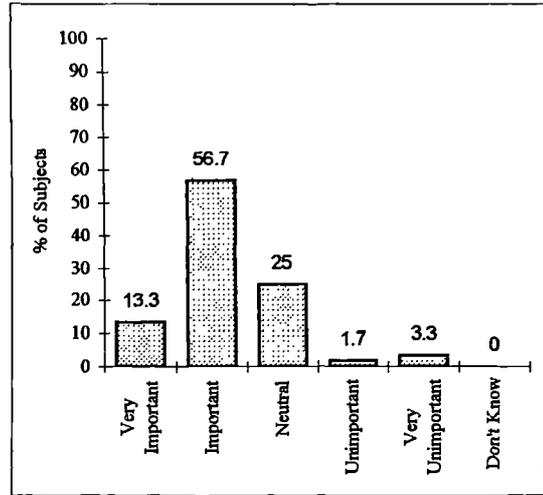
Enabling of other project work

	Percentage	Number
Very Important	13.3	8
Important	56.7	34
Neutral	25.0	15
Unimportant	1.7	1
Very Unimportant	3.3	2
Don't Know	0.0	0
n =	100.0	60

No Answer 3

Total 63

Mean = 2.25
(calculated excluding "Don't Knows")



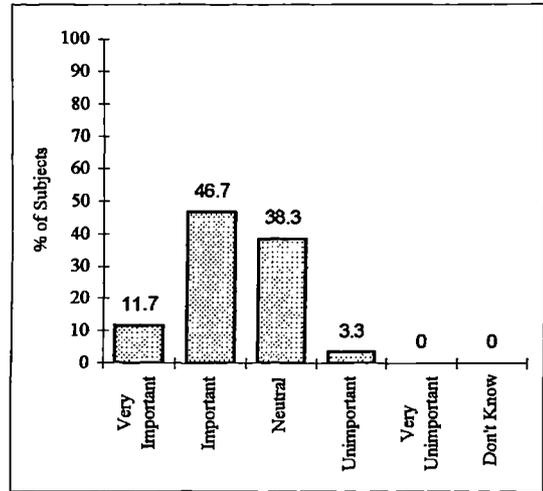
Contribution to continuous improvement programme

	Percentage	Number
Very Important	11.7	7
Important	46.7	28
Neutral	38.3	23
Unimportant	3.3	2
Very Unimportant	0.0	0
Don't Know	0.0	0
n =	100.0	60

No Answer 3

Total 63

Mean = 2.33
(calculated excluding "Don't Knows")



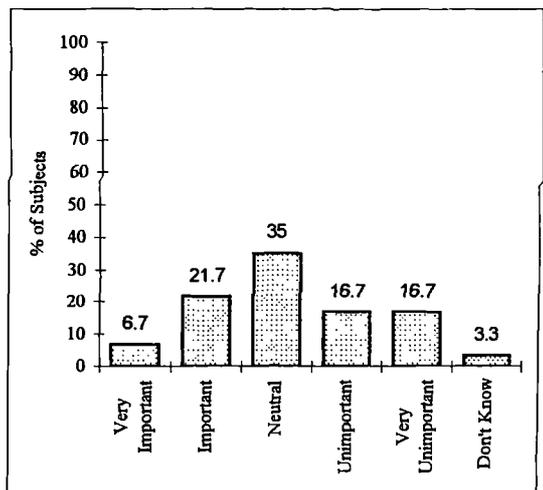
Personal financial rewards

	Percentage	Number
Very Important	6.7	4
Important	21.7	13
Neutral	35.0	21
Unimportant	16.7	10
Very Unimportant	16.7	10
Don't Know	3.3	2
n =	100.1	60

No Answer 3

Total 63

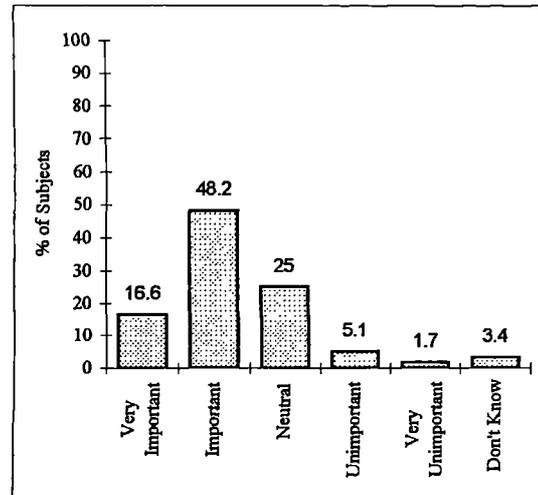
Mean = 3.05
(calculated excluding "Don't Knows")



Appendix 7.1 (Cont.)

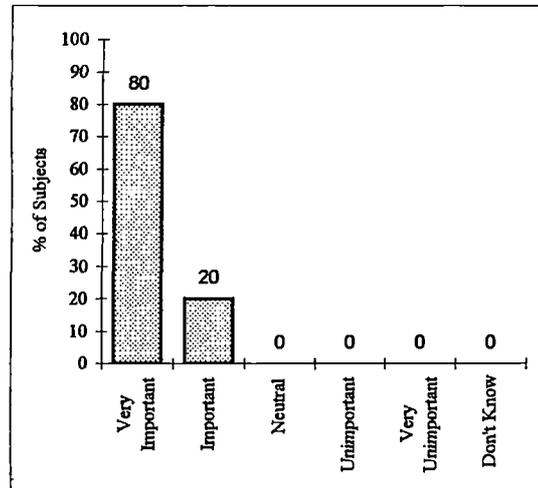
Personal non-financial rewards

	Percentage	Number
Very Important	16.6	10
Important	48.2	29
Neutral	25.0	15
Unimportant	5.1	3
Very Unimportant	1.7	1
Don't Know	3.4	2
n =	100.0	60
No Answer		3
Total		63
Mean =	2.17	
(calculated excluding "Don't Knows")		



Other

	Percentage	Number
Very Important	80.0	4
Important	20.0	1
Neutral	0.0	0
Unimportant	0.0	0
Very Unimportant	0.0	0
Don't Know	0.0	0
n =	100.0	5
No Answer		58
Total		63
Mean =	1.20	
(calculated excluding "Don't Knows")		



Appendix 7.2: Relevance of Project Critical Success Factors – frequency diagrams

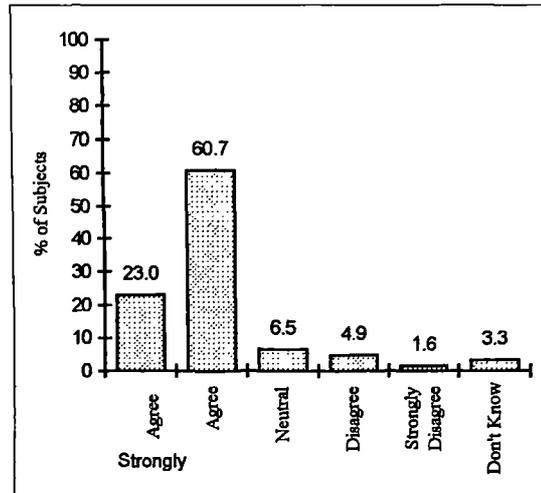
Project manager's ability to delegate authority

	Percentage	Number
Strongly Agree	23.0	14
Agree	60.7	37
Neutral	6.5	4
Disagree	4.9	3
Strongly Disagree	1.6	1
Don't Know	3.3	2
n =	100.0	61

No Answer 2

Total 63

Mean = 1.92
(calculated excluding "Don't Knows")



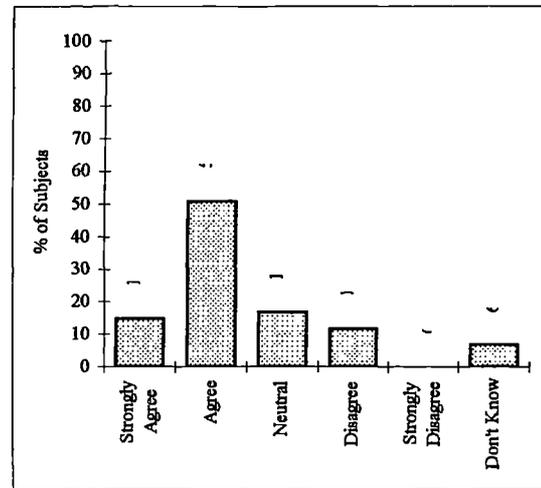
Project manager's ability to make tradeoffs

	Percentage	Number
Strongly Agree	14.7	9
Agree	50.8	31
Neutral	16.4	10
Disagree	11.5	7
Strongly Disagree	0.0	0
Don't Know	6.6	4
n =	100.0	61

No Answer 2

Total 63

Mean = 2.12
(calculated excluding "Don't Knows")



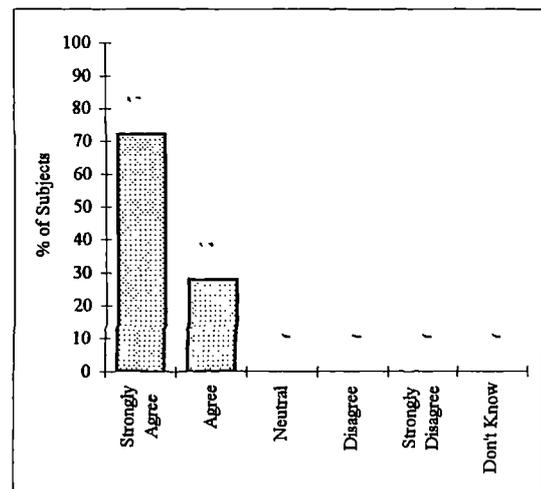
Project manager's ability to coordinate

	Percentage	Number
Strongly Agree	72.1	44
Agree	27.9	17
Neutral	0.0	1
Disagree	0.0	0
Strongly Disagree	0.0	0
Don't Know	0.0	0
n =	100.0	61

No Answer 2

Total 63

Mean = 1.28
(calculated excluding "Don't Knows")



Appendix 7.2 (Cont.)

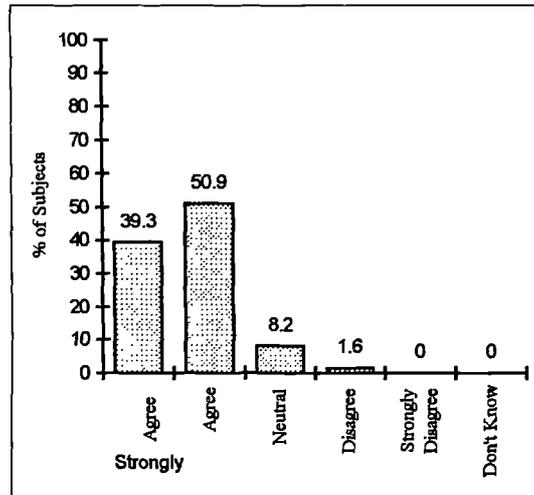
Project manager's perception of their role

	Percentage	Number
Strongly Agree	39.3	24
Agree	50.9	31
Neutral	8.2	5
Disagree	1.6	1
Strongly Disagree	0.0	0
Don't Know	0.0	0
n =	100.0	61

No Answer 2

Total 63

Mean = 1.72
(calculated excluding "Don't Knows")



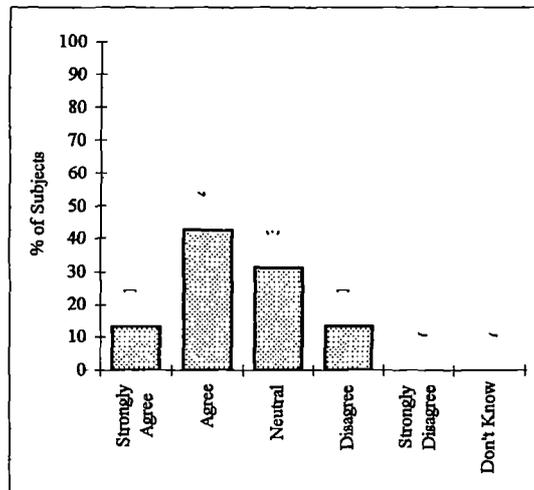
Project manager's technical competence

	Percentage	Number
Strongly Agree	13.1	8
Agree	42.5	26
Neutral	31.1	19
Disagree	13.1	8
Strongly Disagree	0.0	0
Don't Know	0.0	0
n =	99.8	61

No Answer 2

Total 63

Mean = 2.44
(calculated excluding "Don't Knows")



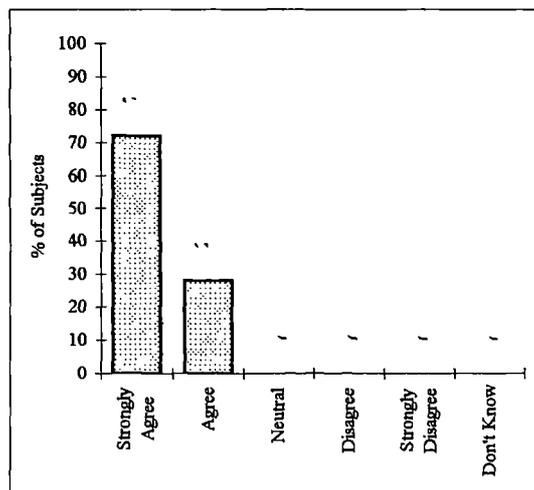
Project manager's commitment

	Percentage	Number
Strongly Agree	72.1	44
Agree	27.9	17
Neutral	0.0	1
Disagree	0.0	0
Strongly Disagree	0.0	0
Don't Know	0.0	0
n =	100.0	61

No Answer 2

Total 63

Mean = 1.28
(calculated excluding "Don't Knows")



Appendix 7.2 (Cont.)

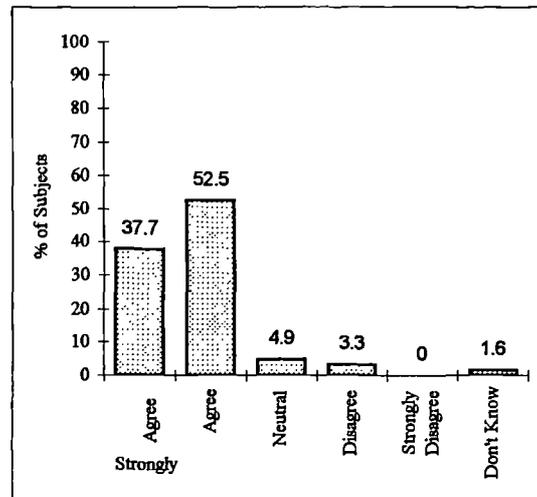
Team member's technical background

	Percentage	Number
Strongly Agree	37.7	23
Agree	52.5	32
Neutral	4.9	3
Disagree	3.3	2
Strongly Disagree	0.0	0
Don't Know	1.6	1
n =	100.0	61

No Answer 2

Total 63

Mean = 1.71
(calculated excluding "Don't Knows")



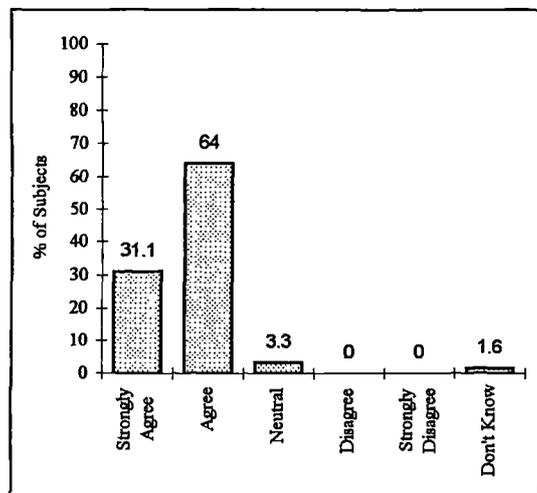
Team member's communication skills

	Percentage	Number
Strongly Agree	31.1	19
Agree	64.0	39
Neutral	3.3	2
Disagree	0.0	0
Strongly Disagree	0.0	0
Don't Know	1.6	1
n =	100.0	61

No Answer 2

Total 63

Mean = 1.69
(calculated excluding "Don't Knows")



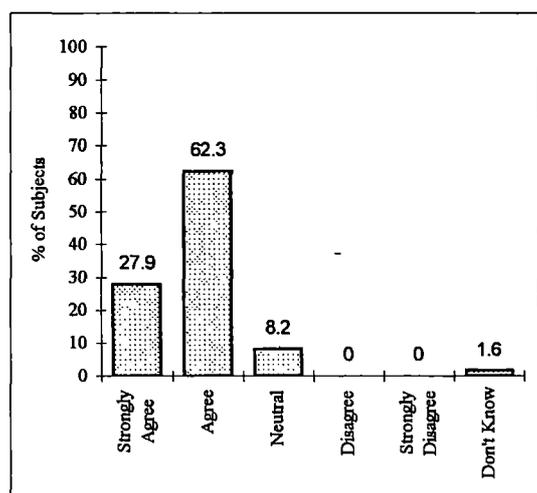
Team member's problem solving skills

	Percentage	Number
Strongly Agree	27.9	17
Agree	62.3	38
Neutral	8.2	5
Disagree	0.0	0
Strongly Disagree	0.0	0
Don't Know	1.6	1
n =	100.0	61

No Answer 2

Total 63

Mean = 1.87
(calculated excluding "Don't Knows")



Appendix 7.2 (Cont.)

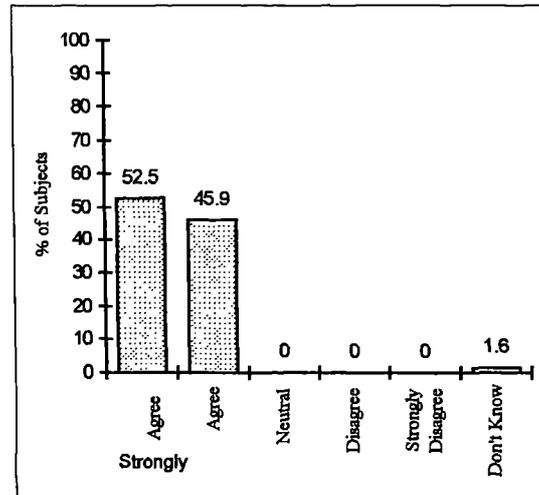
Team member's commitment

	Percentage	Number
Strongly Agree	52.5	32
Agree	45.9	28
Neutral	0.0	0
Disagree	0.0	0
Strongly Disagree	0.0	0
Don't Know	1.6	1
n =	100.0	61

No Answer 2

Total 63

Mean = 1.44
(calculated excluding "Don't Knows")



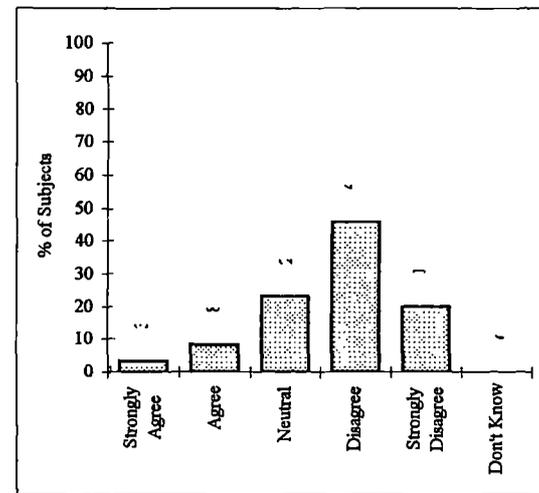
Project size/value

	Percentage	Number
Strongly Agree	3.3	2
Agree	8.2	5
Neutral	23.0	14
Disagree	45.8	28
Strongly Disagree	19.7	12
Don't Know	0.0	0
n =	100.0	61

No Answer 2

Total 63

Mean = 3.71
(calculated excluding "Don't Knows")



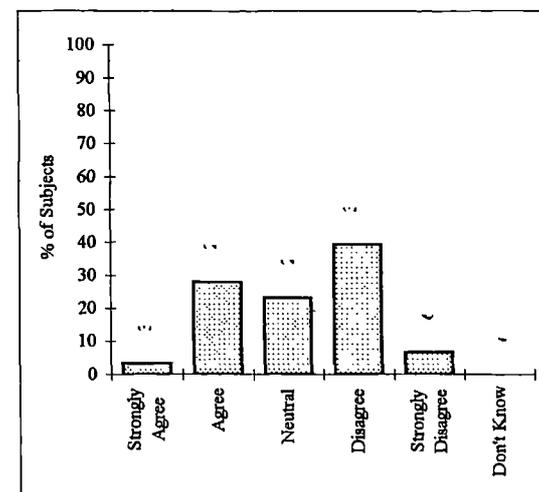
Uniqueness of project activities

	Percentage	Number
Strongly Agree	3.3	2
Agree	27.9	17
Neutral	23.0	14
Disagree	39.2	24
Strongly Disagree	6.6	4
Don't Know	0.0	0
n =	100.0	61

No Answer 2

Total 63

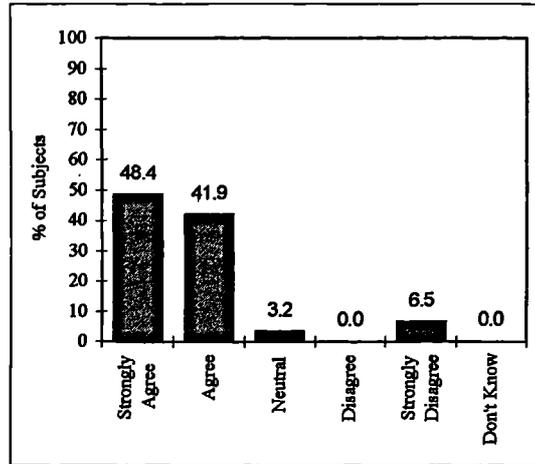
Mean = 3.18
(calculated excluding "Don't Knows")



Appendix 7.3: Usefulness of Project Management Processes/Procedures – frequency diagrams

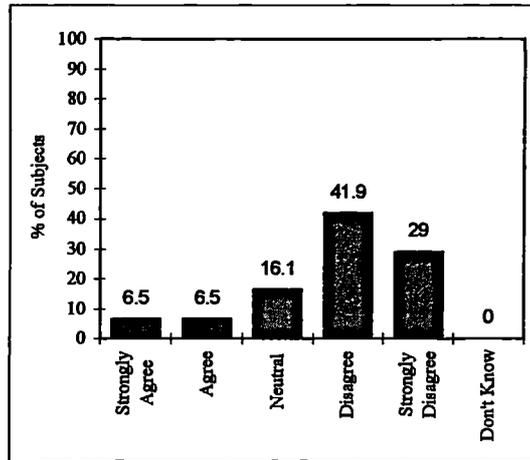
Formal processes/procedures are used, helping us to better manage our projects

	Percentage	Number
Strongly Agree	48.4	15
Agree	41.9	13
Neutral	3.2	1
Disagree	0.0	0
Strongly Disagree	6.5	2
Don't Know	0.0	0
n =	100.0	31



Formal processes/procedures are used but add little value

	Percentage	Number
Strongly Agree	6.5	2
Agree	6.5	2
Neutral	16.1	5
Disagree	41.9	13
Strongly Disagree	29.0	9
Don't Know	0.0	0
n =	100.0	31



Formal processes are not used

	Percentage	Number
Strongly Agree	6.5	2
Agree	12.9	4
Neutral	9.7	3
Disagree	32.3	10
Strongly Disagree	38.6	12
Don't Know	0.0	0
n =	100.0	31

