Chapter 1: Introduction

1.1 Background to the Research

Project management as a field of study encompasses many activities undertaken in both large and small organizations. Increasingly, the use of projects as a way of organising work is the preferred way of operating. People are brought together to achieve a goal, and then disbanded to move on to the next task. Increased use of automated processes and their supporting systems makes the need for layers of managers and supervisors of line staff carrying out day-to-day tasks unnecessary. However, this state of affairs has not occurred overnight: there is a long history of the development of projects and their management, a history that can be traced over hundreds of years. In the 20th century, the project organization has reached a high degree of sophistication, especially in the task-oriented aspects. In the last few years, there has been an increasing awareness of the needs to further develop management theory and techniques concerned with those that undertake the tasks: people.

At the same time as projects were being adopted to undertake tasks such as the construction of buildings, transport infrastructure and communication networks, the same principles were being applied to the development of information systems, and to the provision of information systems-related facilities such as data centres. The research described in this dissertation is concerned with information system (IS) projects in their widest definition, but at the same time recognising that the most common type of IS project is the development of an information system. In common with the wider field of projects, there has been an increasing amount of attention being paid to the people side of IS projects, especially that group variously termed users or clients.

Information systems (IS) or information technology (IT) projects have an unenviable reputation for not delivering systems on time, to budget, or that work as they should. The Standish Group (Johnson 1995) estimate that 31% of IS projects are cancelled before completion and that 52% are completed over budget. Clegg, Axtell, Damadoran et al. (1997) found that 90% of IS projects fail to meet their goals. If this “success” rate
were reflected in projects such as the construction of buildings, the evidence would be visible everywhere. While acknowledging that information systems is a young discipline, with a history now covering some fifty years it would be reasonable to expect that things are improving and that the success rate of system development projects would increase. This does not appear to be the case. Despite advances in project management techniques, and the availability of support tools for project managers, undertaking the development of new information systems remains a very risky proposition.

Research into IS project success and failure has followed many routes, amongst them identifying project risks (Keil, Cule, Lyytinen et al. 1998, Jiang, Klein and Balloun 1998, Schmidt, Lyytinen, Keil et al. 2001), criteria for success (Liebowitz 1999, Yetton, Martin, Sharma et al. 2000), the importance of user participation (Choe 1998; Lin and Shao 2000), organizational process issues (Sauer, Southon and Dampney 1997) and social constructs (Fincham 2002). This research can be categorised into three broad approaches: rationalist (a search for cause and effect), process (socio-technical interaction) and social (interpretation and sense-making) (Fincham 2002). An associated research area is the definition and perceptions of failure (Wateridge 1998).

The majority of this research has focused on the technical aspects of IS projects and their management: team composition, planning, budgeting, management support structures and task difficulty. However, there is a growing body of research that considers the social and organizational aspects of a project to be as important as the technical aspects. A substantial literature exists in the social and management sciences that report theories and research that can be applied to the IS project context. Within this tradition, IS project management is conceived as primarily a social process, one involving people engaged in a process of facilitating change to their environment.

While there is a substantive body of knowledge on why projects in general have failed (primarily due to research that is focused on seeking explanations of cause and effect based on organizational structures and managerial practices: the rationalist approach), there is a lack of models and theories that provide guidance as to how IS projects should be organized so as to include the social and organizational aspects. The net result is a body of knowledge that provides some insights into the general factors that impact IS
project success or failure, but little in the way of prescriptions as to how specific projects should be managed to take into account their individual peculiarities.

1.2 The Research Agenda

In seeking to address this lack of a predictive theory for how to conduct IS projects, there were two principles that I adopted: firstly, one outcome of the research was to be a practical methodology that practitioners could tailor for use in their particular project, and secondly there was to be a sound theory-based model to support the methodology. In addition, there was the desire to incorporate an understanding that had emerged from my professional career as a project manager: IS projects need to be more people-focused. Based on these goals, the research agenda for this research was therefore:

To develop a theory-based people-centred model and a derivative methodology for IS project management that increases the likelihood of project success.

As a result of the research undertaken to address this agenda, I argue that a model of IS project management founded on the concepts of a project constituency and its expectations, supported by the notions of knowledge sharing, accommodation through discourse and collective management through teams, provides a sound platform for a measures-based methodology that can be applied by project managers to their particular project. In developing the theory-based model, I drew on the principles of critical social theory (especially the human condition and issues related to power) (Boudreau 1997) to ground the theory as far as the social aspects are concerned, and also on the principles of pragmatics (especially the role of consequences and pluralism) (Garrison 2000) to ground the theory as far as the non-social aspects are concerned. These two theoretical frameworks were combined in an approach termed critical pragmatism (Forester 1993), and it is this approach that forms the theoretical base for the theory-based model proposed in this dissertation.

The research undertaken to develop the theory-based model arose from the specific research questions that arose out of a detailed consideration of the research agenda. From a critical analysis of the construct information systems, combined with my people-centric view of projects, arose a social-intervention conceptualisation of information
systems project management that viewed information systems development as a social change process. In a review of the literature related to information systems project success and failure, an apparent gap was identified in research related to the management of information systems projects where a collaborative style of user involvement was adopted in conjunction with a social-intervention view of information systems projects. This gave rise to the first research question of this dissertation:

1. What is a possible theoretical model of IS project management that reflects (or is grounded in) a collaborative/social-intervention conceptualisation of IS and IS development?

In order to assess the validity of this theoretical model and to address the overall aim of this research to improve project performance, the subsidiary research question was:

1A. To what extent does this theoretical model of IS project management provide a comprehensive framework for understanding and explaining IS project success and failure?

In order to explicitly address the need for outcomes useful for practice, a further research question arose:

2. What are the characteristics of an IS project management approach that is grounded in the theoretical model of IS project management?

Finally, in order to address the aim of this research (to improve the likelihood of project success), a subsidiary question then was:

2A. Does this IS project management approach increase the likelihood of project success?

1.3 Justification for the Research

Despite advances in technology and software construction techniques (such as object-oriented engineering), and in the tools available to project managers (such as planning software), IS development projects continue to fail. Gartner (Technology News Report
has observed that management issues were a central theme in these failures, recommending more thorough training for project managers and improved management overall. That is, IS project management practice is seen as a major cause of the problems, as well as being the area where improvements can be made.

In proposing a model that is based in theory, this dissertation seeks to lay the foundation for improved practice, a foundation imbedded in an understanding of the complexities of human action. The resultant project management structure builds on this foundation to provide a solid platform for the various tools used by those executing the tasks required to realise the project. Specifically, the research described in this dissertation seeks to:

1. Propose a model of IS project management that can be used to understand why IS projects fail. In doing so, the aim is to enable the large variety of observed problems associated with IS projects to be explained in terms of a relatively small set of principles, thereby laying the foundation for a more consistent understanding of why IS projects fail.

2. Derive the model from a sound theoretical base, in order to enable the model to support one or more methodologies that can be used in the management of an IS project, and then to identify methods that can be used in specific IS projects. This will provide a structured path from theory to practice, and enable specific methods to be identified and used in each project. This approach is in contrast to research that is based on post hoc analysis of project characteristics that, while providing general insights, do not provide guidance for particular projects.

3. Base the research in practice, in order to gain insights into the model and the derived methodology, and to use these insights (learning) to further refine the model, methodology and methods. In this way, a loop is constructed between theory and practice.

In summary, the research has the potential to provide an alternative view of IS project management that may lead to new understanding, and then to improved practice.
1.4 Research Approach

Based on my experience as a project manager, the insight that it is the people aspects of projects that are usually the most problematic, and a comprehensive review of the literature related to project success and failure, IS projects are conceived of as being primarily social systems, wherein those associated with the project continually interact in order to complete the project, including interaction that forms a significant component of the tasks associated with the project. A major element in this interaction is the use of dialog to reach a common understanding of how the project should progress, as is an acceptance of the centrality of the needs and expectations of all of those associated with the project. My philosophical stance is therefore that it is the organizational context of the project and the social interactions that occur in that context that will ultimately determine how the project progresses. The use of an interpretive research paradigm is therefore appropriate.

Research questions 1, 2 and 2A were addressed using an action research project as the research method. This particular research method was chosen so that there would be a close link between theory and practice: the learning stage of the action research method provided the framework and focus for the work associated with developing the theory-based model. During the project, successive iterations of the action research loop provided the opportunity to undertake further development of the model in light of actual events, and to then further refine the methodology and methods.

Research question 1A, which concerns the explanatory validity of the model, involved a meta-study of existing documented reports of past IS projects to discover the underlying themes identified as contributing to the failure of the projects. Ten documented IS projects (that failed) were each analysed through coding in a qualitative research tool (NVivo). Following this coding, common themes were identified, and compared to the model to provide an understanding of these themes. These understandings were then used to assess the theory-based model: by using the basic principles of the model to explain the themes and their inter-relationships, support for the model was obtained. In addition, the meta-study provided additions to the model, leading to an expanded model as the final outcome of this research.
1.5 Outline of the Dissertation

This chapter provides an introduction to the dissertation, by providing an overview of the problem domain, the research agenda within that domain, and the four research questions used as the basis of the dissertation. The research methods adopted are briefly discussed, followed by a statement of the scope and assumptions. The structure of the remainder of the dissertation is shown in Figure 1.1.

Chapter 2 discusses the issue of IS project failure in detail, and explains why a reframing of the question may provide new insights.

Chapter 3 explores in detail the options available to undertake research related to the research questions derived in the preceding chapter. Justification for adopting a
primarily interpretive paradigm is given, and the choice of the action research and meta-study methods substantiated. The research procedures are discussed in terms of a number of suggested guidelines in the literature for these types of research.

**Chapter 4** presents the results of the action research project.

**Chapter 5** describes the model developed during the action research project that provides the theoretical base for the model. The model explicitly identifies the project constituents and their expectations as the foundation concepts that lead to successful project completion.

**Chapter 6** presents the results of the meta-study of the reports of failed IS projects, and discusses each of the themes that are identified in terms of the model.

**Chapter 7** synthesises the research. An analysis of the action research project is presented, both in terms of its contribution to the development of the substantive contents of the model, and in terms of how the method contributed to the research agenda. The results and implications of the meta-study are discussed. Extensions to the model based on the research are identified. The chapter concludes by discussing the implications of the research in the context of IS project management, and suggests avenues for further investigation.

### 1.6 Delimitations of Scope and Key Assumptions

The results obtained from one action research project cannot be used to generalise to other IS projects. Rather, the action research project is a vehicle whereby the model is developed so as to closely link theory and practice; by doing this, the model is more likely to be useful in practice. By addressing the explanatory validity of the model through meta-study, the aim is to establish a level of confidence that the model can be used in practice.

On a broader scale, this research is targeted specifically at IS projects, not at projects in general. Projects are becoming a standard way of undertaking initiatives and tasks in organizations, however, there are sufficient differences between these tasks (for example, between building a bridge and developing a hand-writing recognition
application) to raise doubts about being able to treat these as sufficiently similar to justify extension of the model to these other types of projects.

1.7 Conclusion

This chapter has laid the foundation for the dissertation. It introduced the research domain, research problem and the research questions. Justification for the research was presented, and the research methods to be adopted discussed. Limitations of the research were discussed. Based on this foundation, the next chapter commences a detailed description of the research with a review of the literature.
Chapter 2: Background to the Research

2.1 Introduction

The previous chapter outlined the research agenda for this dissertation as it emerged from my professional background. The research questions were introduced and the research methods employed to answer these questions were briefly described. The research outcomes and the implications for theory, practice and future research were summarised. The purpose of this chapter is to present a review of the literature relevant to the research domain so as to highlight apparent areas where research is likely to be able to contribute to the field. These areas are then explored in detail in order to establish the current state of theoretical development relevant to these areas of potential research. The research questions of this dissertation are then developed in the context of these identified research opportunities.

The structure of this chapter is as follows. The first section of the chapter locates the research within the information system (IS) project success/failure area of research. The specification of a framework for analysis of the literature is then presented, based on a deconstruction of the notion of an information system as defined in the literature. This framework is then used to analyse the literature regarding research, current practice and the political and economic environment that is also affecting the way IS projects are managed. A related area to IS project management, IS development methodology, is then examined to establish its suitability as an appropriate area to provide the set of principles that were used to guide the field research. To provide an initial project management approach for the field research, a model is described based on a critical assessment of the literature and current management practices.

The research questions, the principles derived from IS development methodology (ISDM) research and the initial IS project management approach arising from this chapter provide the theoretical foundation for the research described in this dissertation and provide the basis for the particular research methods selected, as described in the chapter that follows this one.
2.2 The Nature of IS Project Success and Failure

The analysis that is the focus of the first part of this chapter concerns the concepts of *success* and *failure* of IS projects, and in particular the research that has been performed to understand the features present both within the project or as part of the environment that are related to success and failure. In addition, it is necessary to define what is meant by the terms success and failure, as it depends on the perspective of those making the judgement. Therefore, this section is concerned with exploring these various perspectives and the implications this has for analysing the research into IS project success and failure.

In reaching a judgment as to whether an IS project has been a “success” or a “failure”, many objective and subjective issues play a part in the judgement. On one side, objective “facts” such as time taken to complete the project and monies expended can be compared against estimates, and a conclusion reached. On the other hand, more subjective assessments as to quality and functionality do not lend themselves to such simple conclusions. When these issues are considered in conjunction with possibly widely differing views of the people making the judgements, the situation becomes even more confused. Finally, there is the issue of when the judgement should be made: when the project was due to complete, when it was delivered (initially or in its final form), or when it has been assimilated into the normal routines of the organization.

There are two points of view related to "system success" that need to be clarified: the distinction between "success" as applied to the project, and "success" as applied to the system. Separating these two points of view comes back to time and the people involved: the judgment reached will depend on the timeframe used and from whose viewpoint the judgement is made. If the judgement is made at the time that the project is implemented, then it may be judged as a failure in project management terms if it is late and over budget. However, after some period of time, the system may prove to have been successful, as positive business benefits may accrue for some years. Members of the user community (who have to use the system for some time to come) are likely to take a longer-term view. This is the difference between project success and project management success. The former is concerned with the long-term outcomes (product), while the latter has a focus on the traditional measures of cost, time and quality.
This approach provides further support for the differing perspectives of the project management and the users. Nevertheless, “project management success is subordinate to project success” (Baccarini 1999, p29), that is, in the end it is the product that is important, not the process.

Considerable attention has been paid by researchers to what constitutes system success and what constitutes project success. For information system success criteria, the focus has been on organizational issues, especially how the information system has been assimilated into the organization and how the information system has (or has not) contributed to the performance of the organization. In the case of project success, attention has been directed to identifying the success criteria: those features of the project that, if addressed, increase the likelihood of successfully completing the project. In the context of this dissertation, both sets of criteria are of interest, especially insofar as there are differences between the two sets of criteria.

One dimension that has been identified is the differing perceptions of managers and those who have to use the system on a day-to-day basis (Wateridge 1995). Project managers are focusing on the short-term measures of time and cost as set by senior management, and paying less attention to the criteria of the users (Wateridge 1998). However, even this focus on time and budget as immovable deadlines may not deliver what management want. Techniques such as net present value analyses may lead to project success being defined in terms that look at longer-term time/budget combinations (Gardiner and Stewart 2000). In a similar vein, the focus on short-term results manifests itself in the attitudes of managers, whereby the project is “finished” when the day arrives for the system to be handed over to the users for implementation and ongoing operation (Liebowitz 1999). With this view, the project has been successful if the time/budget constraints have been met; yet the system may be an overall failure, or conversely, the time/budget targets may not be met, but the project is an overall success. The message is clear: success or failure is a judgement made at one point in time, and the judgement may change (perhaps radically) as time moves on. While this may not be so evident in the software industry, it confronts us every day in the construction industry: for example, the Sydney Opera House, which took fourteen times the original budget and was years late and yet is now considered to be a national icon (Lim and Mohamed 1999).
While there have been studies which show that the members of the development team also consider the project to be completed when the system is “finished”, and so a successful project is one that is finished on time, this is not always the case: despite being over-budget and late, it may be considered as a success by the project developers (Glass 1999, Linberg 1999). When the project they describe was investigated further, it emerged that the time and budget targets were wildly wrong when it came to actually build the system (which involved considerable new technology). It is not the software development tools that are inadequate, but the means of managing the way the tools are used. In terms of project success a “new theory of software project success may need to include realistic expectations, placing importance on a quality product, and organizational congruency.” (Glass 1999, p19).

In terms of changing the relationship between the developers and the clients in IS development projects, perhaps lessons can be learned from the construction industry, where project partnering is receiving considerable attention. In this scenario, both the team charged with developing the project and those for whom the system is intended work together to solve problems. However, project partnering has to go beyond the simplistic “team building” approach, and focus on real problems and areas of conflict and disagreement (Larson 1997). In IS development projects, the benefits of partnering include establishing contingency plans for possible problems, understanding goals and the roles of the stakeholders and negotiating expectations (Jiang, Chen and Klein 2002).

The nature of the social, organizational and political processes at work within an IS project can also affect the process and perception of evaluations of success and failure. In an analysis of the introduction of a computerised reservation system for the French National Railways, Mitev (2000) discusses the role of individuals in taking the project in the direction that accord with his or her political or organizational context. From this perspective, assessments as to project success and failure are derived from an understanding of the extent to which these individuals actively pursue their individual agendas (success) or not (failure). Project evaluation is therefore an assessment of the extent to which agendas have been satisfied. In a similar study, Wilson and Howcroft (2000) evaluate the introduction of a Nursing Information System in terms of the social and political processes at work in the project environment. In particular, the political imperative to be seen as supporters of the system sponsors and the unacceptability of
negative comments are seen as forces at work in the evaluation process: evaluation can not be objective in this environment. These case studies illustrate the complexity of the evaluation process: success or failure is often socially constructed and not based on an objective assessment of outcomes.

This section has looked at the various viewpoints that can be adopted when evaluating an IS project. Far from only being an exercise in rational judgement as to budget and time targets, an evaluation also has to look at both short-term and long-term benefits to the organization, both from the end-user’s point of view and that of management. When the political and social forces present during an evaluation are also factored in, the complexity of the evaluation process is apparent. The current research into ways to improve IS project outcomes has to take these forces into account, and any theoretical model developed needs to be able to include and explain these aspects of evaluation.

2.3 Analytical Framework

In order to develop a framework for analysing research results concerned with IS projects and their success and failure, it is useful to examine the fundamental concept of information systems. Published definitions of the term information system range from definitions that focus on the work to be done using information technology (IT) through to definitions that focus on the organizational and social roles of information systems. Table 2.1 contains a selection of definitions based on the variety of research and analysis frameworks adopted by the authors.

A common thread in these definitions is an understanding of the dual nature of IS that is technological and human/social at the same time. The above IS definitions differ in the degree to which they emphasise its dual nature or alternatively focus on the technology or human/social dimensions as being of primary concern. However, this is not only an important definitional issue.
Source | Definition
---|---
Alter (1999) | “An information system is a particular type of work system that uses information technology to capture, transmit, store, retrieve, manipulate, or display information, thereby supporting one or more other work systems.” (p42)
Claver, Llopis, Gonzalez et al. (2001) | “…a set of values, symbols and rituals shared by the members of a specific firm, which describes the way things are done in an organization in order to solve both internal management problems and those related to customers, suppliers and the environment” (p248)
Gasson (1998) | “An organizational information system may be viewed as an integrated social system of organizational actors, using information to perform purposeful activity, who may or may not use computer-based technology to facilitate their work and to provide information.” (p224)
Hirschheim, Klein and Lyytinen (1996) | “An information system in its simplest form can be defined as a technological system that manipulates, stores, and disseminates symbols (representations) that have, or are expected to have, relevance and an impact on socially organized human behavior.” (p2)
Cecez-Kecmanovic (2000) | “IS as a social system mediating social interaction: IS are social systems based on Information Technology that mediate social interaction. IS enable new ways of interacting, acquiring, capturing, storing, communicating and sharing information and knowledge. They lead to the emergence of new domains of interaction between individuals, within and between groups and organisations.” (p3)
Land and Hirschheim (1983) | “Information systems are not technical systems which have behavioural and social consequences, rather they are social systems which rely to an increasing extent on information technology for their function.” (p91)
Liu, Sun, Dix et al. (2001) | “Information systems are organizations where people, usually with the aid of technology, perform their duties and carry out business activities. These systems therefore are social systems.” (p229)
Lyytinen and Hirschheim (1988) | “Ontologically we perceive information systems as involving a set of human practices which exhibit regularity and impose constraints on people’s behaviour, but which can also be transformed by knowledgeable social actors.” (p20)

Table 2.1: Definitions of the Term Information System

When IS are developed, modified and implemented it is their dual nature that becomes exposed, but not necessarily well understood. Depending on the prevailing understanding of the nature of IS, the IS projects focus primarily on technological, socio-technical or social aspects. This is termed the Locus-of-Change dimension of IS projects and is the first dimension of analysis proposed in this dissertation. The second (orthogonal) dimension of analysis proposed is concerned with the way developers and users engage during IS projects, an engagement which can range from little or no involvement through to a fully collaborative relationship. This dimension of analysis is
termed the **Locus-of-Engagement** dimension. Each of these proposed dimensions of analysis consists of a continuum of defining characteristics.

In the conduct of an IS project, the roles that people occupy are varied, ranging from roles as developers, as owners and managers, through to roles as users. Current IS project management practice has a separation between the developers and the users: the users define the “requirements” for the system that the developers build: the developers acquire the requirements as part of their task. The distinguishing feature on the people dimension is the nature of the relationship between the two major groups in a project: the developers and the users/clients. At one extreme there is little communication: users/clients may have little input to the processes of the project. At the other extreme, the project is seen and run as a community effort. Three regions of the Locus-of-Engagement dimension can be identified.

The first of these is termed *instrumental*: it refers to an essentially one-way transfer of information from the users/clients to the developers. This may be achieved through structured interviews or in writing, through the use of documented procedures as the basis of information. In this view, users/clients are considered to be passive: their role is to operate the system according to specified procedures. The second region of the locus of engagement dimension is termed *consultative*: there is a two-way dialog when analysis is being undertaken, however the developers are still the owners, with the views of the user sought and incorporated into the analysis, based on the judgement of the development team. The third region is termed *collaborative*: the system is owned by the users in the sense that they are the ones who will realise the benefits afforded by the system, and therefore their use is of prime importance. The project is a joint undertaking, with the developers and the users having meaningful social interaction and knowledge co-creation. In the ideal situation, differences in power relationships will not be relevant to these interactions, however, where power differences do play a part in the social interactions, the desire of the participants to reach a mutually acceptable outcome acts as a counter-balance to the power differences.

The Locus-of-Change dimension, on the other hand, is concerned with the perceived importance of technological issues versus social and organizational issues. At one extreme, the issues associated with the project are seen to be based in the technology, at
the other extreme, in the organization. As with the locus of engagement dimension, the locus of change dimension is a continuum, however, three regions can also be usefully identified on this dimension for purpose of discussion. In those circumstances where issues are seen to lie in the technical domain, the region is termed *technocratic*: the focus of the project is on technical issues almost to the exclusion of organizational issues. The project is driven by technological concerns: development methodologies, language selection, hardware acquisition, and data conversion. Numerically intensive systems (such as weather forecasting systems) are examples of projects occurring in the technocratic region. Issues related to transferring the system into the use domain may be considered late in the project, as part of the implementation. The second region on this dimension gives more recognition to the issues associated with the organizational context, and is termed *socio-technical*: both technical and organizational issues receive attention. An example of a project occurring in this region is an air-traffic control system, where both technical concerns and the human interface are equally important. The third region of the locus of change dimension is termed *social intervention*: the project is seen primarily in terms of its role in changing the way the organization operates, with the technological artefacts considered to be tools used to achieve this change. Work-flow management systems are an example from this region: the emphasis is on organizational issues. The regions associated with each of the dimensions then give a 3 X 3 matrix of possible combinations, as shown in Figure 2.1.

This matrix has nine cells, each with a different characteristic. In the discussion that follows, the cell being referred to is labelled according to its two defining regions on each of the dimensions. In these discussions, the focus is on how the IS project is conducted (that is, the underlying assumptions about the role of people and technology in IS), rather than the particular system that is being developed as part of the project. Thus, while a project may have a high technology content (for example, the installation of a new communications network to support an ATM network), it is still possible to adopt the view that the changes resulting from the project raise issues that are primarily in the social or organizational domain (for example, accessibility for customers and branch closures). At the same time, the degree of engagement of the users/clients in this project may range from virtually nil (for example, decisions are made with reference to published policies) through to a collaborative environment where decisions are taken jointly by all of those affected by the project.
In order to use this framework as the basis for discussing the research in IS project management, it is useful to have descriptors of each of the cells: Table 2.2 provides these.

<table>
<thead>
<tr>
<th>Cell</th>
<th>Name</th>
<th>Projects managed using this approach are characterised by ...</th>
</tr>
</thead>
</table>
| Instrumental-technocratic | Use of prescriptive methodologies  
Reliance on existing documentation and/or management's views on how the system should work; minimal interaction with people from the business  
Plans that focus on issues related to the technology to be adopted  
Issues related to moving the system into the business are seen as outside of the project scope |
| Consultative-technocratic       | Use of methodologies that include a recognition of the importance of people in IS  
User representatives from the business included in the development team  
Plans that focus on the technology components  
Issues relating to transferring the system into the business are assigned to the business representatives, and not explicitly identified in plans |
<table>
<thead>
<tr>
<th>Model Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collaborative-technocratic</td>
<td>The technology is the focus: efforts within the project are aimed at identifying and minimising technology-related risk. The development team and the user/client community work together to identify the best outcomes for the project. Prototypes used as a means of exploring alternatives.</td>
</tr>
<tr>
<td>Instrumental-socio-technical</td>
<td>There is recognition that both organizational issues and technical issues are relevant to successful project outcomes. Any methodology adopted caters for the inclusion of organizational requirements. User/clients are seen as sources of information, but any decisions can be made with reference to management and/or procedure manuals. Project plans include the tasks necessary to move the system into the business.</td>
</tr>
<tr>
<td>Consultative-socio-technical</td>
<td>A balance is achieved between technological issues and organizational issues, as identified by users/clients being part of the project team. Methodologies adopted cater for organizational issues. Requirements are developed as a result of the development team seeking input from the users/clients. Project plans incorporate both technology-related tasks and organization-based tasks, and these are managed by both parts of the business.</td>
</tr>
<tr>
<td>Collaborative-socio-technical</td>
<td>There is a balance between attention to technology-related issues and organizational issues. The requirements for the system arise out of a common understanding of what needs to be achieved; efforts are aimed at sharing information between all members of the team and the community. The project plans reflect the evolving nature of the project as this information is shared. Responsibility for the project is seen as being in both the technical domain and the organizational domain.</td>
</tr>
<tr>
<td>Instrumental-social intervention</td>
<td>The major issues facing the project are seen as arising from the social and organizational domain. Prescriptive methodologies are only used for the technology-related artefacts. Information about the organization and its shape are seen to be the domain of management; users/clients are seen to carry out management directives. Project plans are not defined to task level, reflecting the ambiguity of appropriate solutions to the organizational issues.</td>
</tr>
<tr>
<td>Consultative-social intervention</td>
<td>User/clients are contributing to the new organizational forms implied by the new IS. Project plans are focused on the organizational change agenda. The technology component of the project is seen as simply requiring the purchase or construction of a tool and transferring it into the workplace.</td>
</tr>
<tr>
<td>Collaborative-social intervention</td>
<td>Focus is clearly on the changes possible due to the new IS. Users/clients are driving the project due to the organizational focus, but the technical staff are seen as providing the necessary</td>
</tr>
</tbody>
</table>
Table 2.2: Descriptors of the Analysis Framework

With these descriptors available, the research into IS project management can be examined so as to build a picture of the current situation. The same framework will also be used to examine current practice as exemplified by published industry bodies of knowledge and texts aimed at students and practitioners, to analyse the political and economic environment insofar as it impacts on the use of information systems and IS project management in organizations, and to establish the extent of research in IS development methodologies that are consistent with the view of IS project management that emerges from the preceding three analyses.

2.4 Analysis of Current Research

In examining contemporary research into IS project management, and in identifying research focused on regions within the proposed analysis framework as shown in Figure 2.1, it is immediately apparent that a) the research does not explicitly refer to project management, and b) change and engagement are not terms used as such. However, a deeper analysis of the research studies of IS development projects reveals what was the implicit locus-of-change and locus-of-engagement. This deeper analysis sometimes required me to “read between the lines”, and make a judgement about the underlying (non-expressed) attitudes and/or assumptions about these two dimensions. However, there were cases where it was not at all clear what the classification should be (due to the brevity of the description of the study and insufficient details of the IS project) and which, therefore, could not be taken into account.

Furthermore, a number of studies examined IS development project risk and success/failure aspects. These studies sought to identify reasons why IS projects do not achieve their stated aims, usually in terms of factors that can be shown to be related to the project outcomes. In that these factors reflect the way the development projects were conducted, these studies can be taken as reflective of, and can be analysed in terms of, the project management practices adopted. However, this has the effect of narrowing the
The scope of the definition of IS projects adopted, in that non-developmental projects are not included.

The results of the analysis are shown in Figure 2.2, wherein two groupings have been identified. That there is no explicit identification of the nine cells is deliberate: while the identification of the ideal types as detailed in Table 2.2 is useful for explanatory purposes, a particular piece of research will rarely clearly correspond to a particular ideal type, for reasons discussed above. Each of the groupings is discussed next.

Research with a technocratic edge

This research is typically limited to IS development projects that are concerned primarily with the technology to be developed, that is, most usually the creation of software artefacts. The organizational issues are not given prominence; the attitude apparent towards the users varies from not considering issues related to users to an acknowledgement that these issues are validly part of the research domain.

A recent survey of the literature on IS project success (Linberg 1999) identifies six critical success factors: project leadership, the organizational environment, realistic technical expectations, realistic project plans, sufficient resources and a cohesive team. All of these are centred on the project team (the organizational environment refers to how the members of the development team are managed): none refer to the broader aspects of the organization within which the system is to be placed. A specific example of research where user-related issues are not identified as critical to project success is that of Cooke-Davis (2002). Based on a network of practising project managers, Cooke-Davis (2002) identifies eleven factors that contribute to project management success, individual project success and continued project success. These factors relate primarily to the mechanics of project management (risk management, documentation, time frames, scope control, measurement), with the organizational issues related to the relationships between project management and line management: the engagement of those using the systems is not identified as key to project success.

Users cast in the role of resources for the development team emerge from the research of Choe (1998) and Jiang, Klein and Discenza (2001). In the work of Choe (1998) users are seen as clarifiers of information needs (that is, instruments in the design process),
and the systems themselves are characterized as essentially technical systems. Both behavioural and technical risks were identified by Jiang, Klein and Discenza (2001) as being central to project success, however, their risk categories indicate the centrality of the project team in a project, with users a resource for the project team. “Users are not available to answer the questions [posed by the project team]” (Jiang, Klein and Discenza 2001, p49) is an example of an identified risk category.

The motivation, attitude and involvement of users in the development process have been identified as factors in project success. Chatzoglu and Macauly (1997) developed a model for estimating the time required to complete a project and as part of this research, the user’s motivation towards the system emerged as an important factor, alongside the expertise of the development team, the communication within the team and the project management approach. In an attempt to understand the importance of user participation in systems projects, Lin and Shao (2000) found that “getting users involved in the development process may improve their attitudes toward the system” (Lin and Shao 2000, emphasis added).

Ballantine, Bonner, Levy et al. (1998) propose a model of IS success, the 3-D Model of Information Systems Success, that identifies three dimensions: development, deployment and delivery, together with intervening filters that mediate between the dimensions and external factors. The development dimension is concerned with the technical system characteristics, including data quality, development process and methodology and user involvement; the deployment dimension looks at the ‘used information system’, such as task type and impact; and the delivery dimension is concerned with the ‘effective information system’, including alignment of objectives and benefits management. ‘Success’ is then modelled as a learning process involving the three dimensions. The differing roles of people are also identified in the model: the development team features highly in the development dimension, whereas users and management are identified as the key roles in the deployment and delivery dimensions, implying that user involvement during implementation is a key factor in project success.
Figure 2.2 Classification of Research on IS Project Success and Failure

Note: Due to the varying lengths of the citations, the standard adopted is that the beginning of the citation reflects the location of the research in the analysis framework.
A more active role for users within technology-focused development teams is identified as important for project success in research by Liebowitz (1999), Liebowitz (1999a) and Jiang, Klein and Discenza (2001). Senior IS managers, when queried about the development stage where IS project failures originate, identified the problem scoping and inception stage as the most significant, with 55% of the ultimate failures ascribed to this phase (Liebowitz 1999a). The factors identified for this focused on the requirements, the organizational culture, political pressures, reporting structures and lack of consultation. Increased consultation is seen as a key way to address this situation, in an environment of improved management of the technology involved and active involvement by all interested parties throughout the project (Liebowitz 1999).

Along similar lines, when developing technical systems, Jiang, Klein and Discenza (2001) identified four ‘development focuses’: user (e.g., use an evolutionary design approach), institutional (e.g., training), commitment (e.g., management support) and simplicity (e.g., avoid changes). These focuses were then related to the behavior of the development team and the project manager in that by adopting these focuses risk could be managed better. A similar result is reported by Yetton, Martin, Sharma et al. (2000) who identified support from senior management and user participation (along with team dynamics and the management of risk) as key determinants of project success.

From a different perspective, in a critique of government-issued IT procurement guidelines, Warchus (2001) points to the importance of obtaining and seriously considering the users of systems. Even though these guidelines are aimed at technology-related procurement issues rather than information systems development in general, there is a clear call for users to be an integral part of new systems development.

Taken overall, this grouping of research demonstrates the variety of attitudes to users within an essentially technology-driven development environment. These attitudes range from users-as-resources to users being consulted on key issues related to the project. Their conceptualisation of IS project success and failure is that managing an IS project is an exercise in control: by identifying all of the inputs to the process (including users), and by rigorous planning and measurement, success will follow.
Research in the middle ground

This body of research sees both the technological and organizational components of information systems as equally important to project success, that is, a socio-technical attitude. With regard to the role of users in the project, the view is that there needs to be a sound relationship between the two groups (developers and users); the development team will consult with the users when needed, particularly in regard to requirements and implementation.

An important point in the development of models of IS success, DeLone and McLean (1992) developed a model of information systems success based on an analysis of research published to that date. Its main elements of system quality, information quality, user attributes, user satisfaction, individual impact and organizational impact can be applied to any system, whether it was developed last month or ten years ago: the model is separated from the development activities that generated the system. However, the issue of a causal link between the development activities and the model criteria of system quality and information quality remains a moot point. A number of modifications to the model have been proposed with the aim of explicitly identifying user involvement (Seddon and Kiew 1994) and information awareness (Bonner 1995) as important distinctions, and to emphasise that use is not synonymous with success (Seddon 1995). In terms of the current analysis framework, there is a clear identification of both dimensions and the relationship to the user community.

Process integration and standardization, through the management (minimisation) of individualism is seen by Clarke (1999) as a way to tackle the cultural issues involved with projects, which seems to suggest some form of de-individualization. However, she does recommend “the encouragement of employee participation” (Clarke 1999, p144) as a means of developing rather than imposing a corporate culture: this suggests that a consultative approach is envisaged, as is an improved communication flow between the affected parties. At the same time, the use of prescriptive plans for their own sake is seen by Clarke as working against the possibly diverse cultures present in an organisation: there has to be a recognition of the cultural environment. This is consistent with the concept of organizational fit (Glass 1999) as a criterion for success in addition to better planning and control of quality.
In an attempt at identifying more general risks faced by projects, Keil, Cule, Lyytinen et al. (1998) developed a risk categorization framework that identifies factors outside of the control of the project manager as the most important. These include lack of top management commitment, failure to gain user commitment and a misunderstanding of requirements. This points to a model of risk management that encompasses areas outside of the traditional development team, and therefore recognition of the environment of the project team and the role of people in that environment. In a later study by the same research team (Schmidt, Lyytinen, Keil et al. 2001), a comprehensive set of ranked risk factors was proposed, based on a cross-cultural study. This research confirmed the importance of relationships with the user community, although this is clearly of a consultative nature, as illustrated by risk items such as failing to gain the commitment of the users, the lack of a definitive set of requirements and the failure to ensure that the end-users have realistic expectations of the eventual system (Schmidt, Lyytinen, Keil et al. 2001). The importance of environmental factors such as comprehension, motivation, skills, resources and communication to project success was identified by Lidow (1999).

This notion of user commitment was incorporated into a model by Sauer (1993) who proposes a model of information systems failure that identifies the key elements as being the dependencies between the system, its supporters and the project organization. The project organization conducts an innovation process to create a system that will serve organizational supporters (stakeholders), who in turn support the project organization in its efforts (Sauer 1993, p57). This model is consultative in that ongoing dialog between the developers and stakeholders is envisaged, however the model continues with the notion of a separate development team, whose primary focus is the creation of the technical artefacts. This notion of perceived impact (benefits) is also reported by Shenhar, Levy and Dvir (1997), who distinguish between customer impact, business impact and future impact as the dimensions of this factor.

The need for consultation and agreement from stakeholders occurs in other research. In defining project success, Wateridge (1998) recommends that “Project managers must get agreement from all stakeholders on the criteria for success” (Wateridge 1998, p63): that is, all involved in a project need to be consulted, implying that a balance needs to be struck between the technical view of the developers and the organizational view of
the stakeholders. In a similar vein, Lai (1997) proposes a ‘synergistic’ approach to IS
development: the project “should look at the total picture, work from the whole to the
particular and consider all the interaction necessary between various elements of the
parties, including people and machines” (Lai 1997, p177). This is therefore a balance
between technology and social issues, albeit in a primarily technological environment as
evidenced by a focus on performance, cost and time as the criteria for project success.
Reaching a priori agreement on the outcomes of the system was confirmed as important
for system success by Jiang, Klein and Discenza (2001), an approach termed
‘consonance’, defined as agreement among the stakeholders. Forming partnerships with
the user community (‘partnering’) has been found to be important through the
development cycle (Jiang, Chen and Klein 2002) (although this is seen as occurring in
the context of a separate development team).

In a move away from the development team as the driver of the project, Coe (1998)
includes the use of an implementation manager and support for users as two of the five
key factors. Similarly, user ownership (together with positive user attitudes) was
identified by Coombs, Doherty and Loan-Clarke (2001) as a key factor in the successful
adoption of a community information system. Beyond simply advocating “user
ownership”, their research exposed the need for user ownership “to be explicitly
planned and then facilitated through the adoption of best practice” (Coombs, Doherty
and Loan-Clarke 2001, p13). This is consistent with a move towards the collaborative
view of user involvement in projects.

As a body of research, this group reflects a clear recognition of the importance of user
involvement in project success, although the extent and nature of this involvement
varies. Together with a recognition of both technical and organizational components of
information systems being important, this group in general mirrors the practice of IS
project management reflected in industry guidelines and texts, which are discussed in
greater detail in the next major section of this chapter. This body of literature views IS
project success and failure in terms of separating the technical issues from the people-
related issues: the technical issues can be managed by adopting deterministic planning
and evaluation techniques, while the client-related issues, although acknowledged as
being important to the project, remain problematic and to a large extent outside of the
control of the project team.
As a complementary body of research to that discussed above, some researchers have approached the subject of project success from the perspective of the management of risk, and the recognition and management of these factors can be considered as an exercise in risk management. This view has been expressed by several authors, for example, "Much of good project management practice could be thought of as the management of pervasive and fundamental process risk in the PLC" (Ward and Chapman 1995, p149), and "Identification of the sources of risk must be a prime function of any project manager" (Stewart and Fortune 1995, p279).

The management of risk can be undertaken via a number of strategies, including acceptance (doing nothing), adoption (adjusting to the new reality), avoidance (not letting the undesired events occur) or transfer (sharing the consequences with others) (Kliem and Ludin 1992). A number of techniques to assist in these strategies have been proposed, ranging from the analytic (for example, Royer 2000) to those that recognise people issues as the most important (for example, Oldfield 2001). One important distinction made by researchers is the difference between reactive and proactive risk management, with "risk pro-action" (Kliem and Ludin 1992, p89) seen as the ideal approach: it is more beneficial to anticipate adverse risks than have to react to them.

In the IS project field, effective risk management is also considered to be an important part of the project manager's job (Wyatt 1995). In a survey of 120 projects, Barki, Rivard and Talbot (1993) identified lack of expertise, application size, organizational environment and technological newness as significant factors. In undertaking their analysis, these authors included an estimation of the magnitude of the potential loss due to each factor as one variable in determining the importance of each factor. This non-technical view of project risk management has been addressed in detail in a paper by Lyytinen, Mathiassen and Ropponen (1998), wherein a socio-technical model of project risk is presented. The main components of a socio-technical perspective (task, structure, actor and technology), together with combinations of these (for example, actor-technology), are used as categories to identify risk items and to suggest risk-resolution techniques. In addition to the risks associated with technology, changing requirements and top management support, the authors identify such issues as ethical problems,
political conflicts, power plays, lack of communication and false beliefs as also important. This view of risk management is consistent with the socio-technical/consultative theme.

Approaching IS project success and failure from the risk management perspective provides the opportunity to consider the multitude of factors that may threaten the success of a project and actively seek to minimise these risks, whether they are in the technical area (such as equipment and budgets), or in the people-related area (such as the role of end-users in exploring alternative implementation approaches).

A summary of current research

From Figure 2.2, it is apparent that research into IS project management as reflected by research into IS development is an area of current activity. It is apparent that issues related to the involvement of users command attention from many researchers, yet there appears to be a prevailing attitude that consultation is an appropriate model for how users should be related to IS development projects. That is, users are consulted by the developers in order to better determine the scope of the information system: this occurs primarily at the behest of the development team. At the same time, IS projects are regarded as possibly encompassing both the technical and the organizational domains. However, current research suggests that technology rather than organizational specialists primarily drives the overall development agenda.

Beyond a recognition that the role of people (be they end-users, clients or other stakeholders) is a key factor in the eventual success or failure of IS projects, there is no general agreement as to how best to incorporate this recognition into IS project management practice. Much of the literature is centred on the project as the object of study, and then looks at factors under the control of the project team as the way to improve project outcomes. That IS projects continue to fail suggests that centring IS project management on the project as the prime object of study is not conducive to providing a theoretical model of stakeholder involvement that could inform how to effectively address the threats to IS project success that arise from the relationships between the project team and the stakeholders.
Other Regions of the Analysis Framework

From Figure 2.2, it is apparent that research into IS project success/failure that involves a collaborative view of the role of users is sparse. From the discussion of the basis for the analysis framework in Section 2.3 of this chapter, it is possible to conceive IS projects that can be described in collaborative terms (see Table 2.1). That little research has been done into these types of projects from the perspective of how they are managed represents an opportunity for future research. The management of IS projects where the prevailing view is of IS as a mediator of social change (as explained in Table 2.2) has received little or no attention. The reasons behind this lack of research into IS project management based on a collaborative view of users are not immediately apparent.

One possible explanation is that the majority of current IS projects are managed in ways that have their origins in “traditional” projects, such as those in the construction industry, and that this has provided a research environment that has a built-in bias that sees people-related issues as outside the scope of the project or at best as a risk factor. Evidence for this explanation can be found in the research method used, which is typically based on surveys, reflecting the reliance on existing practice to provide the data for the study. As an example: “An obvious source for such information is an expert in the field with years of experience in managing software development projects.” (Schmidt, Lyytinen, Keil et al. (2001, p10) describing the subjects for their study – practicing project managers); however in discussing the limitations of their study, these authors do suggest that the perceptions of other stakeholder groups (such as functional area managers and senior executives) should be included in studies.

The intersection of collaboration in the engagement dimension and social intervention in the change dimension represents the location of the research reported in this dissertation, and this will be discussed further later in this chapter. Before this, an analysis of current recommended practice from the viewpoint of the engagement/change analysis framework is presented.
2.5 Analysis of Current Recommended Practice

The previous section in this chapter reviewed the recent research in the field of IS development, as an indicator of IS project management approaches. The picture that emerges reveals two major areas, as represented by the two groupings that were used to discuss the research. Complementary research into risk management suggests that the “middle ground” as represented by the socio-technical/consultative area of the analysis framework represents the current thinking with regard to the balance required between the technical factors of project management (defined as the need for planning, reporting, human resource management, budgeting and similar techniques) and the non-technical factors of IS project management (defined as the relationships between the project team and the organization and people associated with the project). As this research is heavily based on practice (in particular current IS project managers), it is necessary to review the professional literature aimed specifically at practitioners, to determine the degree of consistency between research into the practice of IS project management and recommended standards and guidelines.

The Association for Project Management (APM) is a UK-based organization with a charter to provide standards and guidelines for the improvement of the practice of project management. One of their major publications is the APM Project Management Body of Knowledge (Association for Project Management 2000), which is a resource for project managers and is the basis for the certification issued by the APM. While the APM Body of Knowledge is not aimed specifically at IS projects, it is intended to include IS projects as one type of project that can be conducted using the guidelines. Excluding the introduction and references, the guide covers some forty (40) pages. What is of interest in the context of the current discussion is the relative importance given to the various topics. As an approximate measure of relative importance, the number of pages devoted to each topic is used in this comparison.

Seven major topic areas are identified (General, Strategic, Control, Technical, Commercial, Organizational, People), and each is further sub-divided. The first five sections are focused on the technical aspects of project management, and include topics such as value management, time scheduling, change control, earned value management and financial management. It is in the last two sections (Organizational and People) that
the non-technical issues (as defined above) could be expected to be addressed. However, the section on organizational issues is concerned with how the project relates to the rest of the organization; the topic on organization structure is concerned with the shape of the project team, not the wider context. The section on people acknowledges the importance of managing people, and provides some advice on how to communicate, how to build teams, the importance of leadership, conflict management, negotiation and personnel management. In all, three (3) pages are devoted to this section. Overall, these guidelines appear to offer the practicing project manager little in the way of guidance in matters non-technical, with less than 10% of the guide addressing non-technical issues.

A more substantive set of guidelines is published by the Project Management Institute (PMI), a US-based organization. It is a document with a similar audience and intent as the APM equivalent, and runs to some 158 pages (Project Management Institute 2000). There are 12 chapters (Introduction, Context, Processes, Integration Management, Scope Management, Time Management, Cost Management, Quality Management, Human Resource Management, Communications Management, Risk Management, Procurement Management). Specific topics that deal with non-technical aspects of project management (as defined above) include a discussion of stakeholders, organizational influences and social-economic-environmental influences in the context chapter, and topics on team development in the human resources management chapter. In total, some thirteen (13) pages are devoted to these topics. In common with the APM guidelines, the PMI guidelines devote less than 10% of the space to non-technical issues. It is interesting to note that this guide contains examples from IS project management, so is clearly targeted at IS project managers: this is supported by the existence of an IS Special Interest Group (ISSIG) within APM whose focus is project management issues as they relate to developing information systems.

Possibly even more accessible to IS project managers than the general PM Bodies of Knowledge are the texts written specifically on the topic. While these are aimed at both the student market and the professional market, their content provides an interesting insight into what is being put forward as recommended current practice for IS project managers. A similar analysis to that carried out for the PM Bodies of Knowledge is presented in Table 2.3.
This sample falls into three identifiable groups, based on the estimated percentage of coverage given to the non-technical aspects of IS project management. The first seven (7) are consistent with the APM and PMI Bodies of Knowledge, in that coverage of the non-technical aspects is considerably less than that devoted to the technical aspects; that the text by Schwalbe (2002) is recommended by the PMI ISSIG web site supports this. The second group consists of the texts by Cadle and Yeates (2001) and Rea and Lientz (1998), and represents an explicit recognition of organizational issues by these authors. The texts in both of these groups are consistent with a consultative view of the role of users, however only the second group directly addresses the organizational aspects of information systems as represented by the socio-technical model, albeit the technical issues still dominate the writings.

A significantly different approach is taken by the text by Thomsett (2002). The first groups of texts (and especially the first group discussed above) have the project manager primarily concerned with matters within the project team as the focus of concern. Thomsett (2002) changes this to a focus primarily on matters outside of the project team, that is, the organizational environment. From this change of point of view comes a focus on the organizational imperatives for the information system, especially the relationships between the actors in the environment (such as senior management, users and functional business areas). This change of point of view results in the non-technical issues of project management being considered as more important than the technical aspects. However, in terms of the analysis framework, this text is located in the socio-technical/consultative area of the grid, as users (although important) are seen as being ‘consulted’, and information systems remain a combination of the technical and social.

Overall, the results of the review of recommended practice presented in this section are consistent with the review of the research into actual practice: the socio-technical/consultative view is the dominant point of view. However, an extra dimension emerges from the current review: although organizational issues are acknowledged as important, current practice in the form of professional publications almost universally is concerned with the technical aspects of IS project management over the non-technical aspects.
<table>
<thead>
<tr>
<th>Text</th>
<th>Percentage of pages devoted to non-technical issues</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>McLeod and Smith (1996)</td>
<td>4%</td>
<td>Standard text with useful advanced topics; even though its title uses “IT”, there is consistent reference to “IS”</td>
</tr>
<tr>
<td>Olson (2001)</td>
<td>5%</td>
<td>Text for university courses</td>
</tr>
<tr>
<td>Phillips (2002)</td>
<td>5%</td>
<td>A reference text aimed at project managers wishing to improve their skills with a view to certification</td>
</tr>
<tr>
<td>McManus and Wood-Harper (2003)</td>
<td>5%</td>
<td>Almost an exclusive focus on methodologies, planning, monitoring</td>
</tr>
<tr>
<td>Hallows (1998)</td>
<td>8%</td>
<td>A reference published by the American Management association aimed at practitioners</td>
</tr>
<tr>
<td>Schwalbe (2002)</td>
<td>8%</td>
<td>Text for university courses; recommended by PMI ISSIG</td>
</tr>
<tr>
<td>Friedlein (2000)</td>
<td>11%</td>
<td>Although focuses on Web development, uses a system development lifecycle</td>
</tr>
<tr>
<td>Cadle and Yeates (2001)</td>
<td>20%</td>
<td>Includes three chapters on business strategy, selling the project and managing the client</td>
</tr>
<tr>
<td>Rea and Lientz (1998)</td>
<td>21%</td>
<td>Uses critical business process as base</td>
</tr>
<tr>
<td>Thomsett (2002)</td>
<td>&gt;50%</td>
<td>A practitioners guidebook based on seminars presented by the author’s company; a radical departure from the other books listed here</td>
</tr>
</tbody>
</table>

Table 2.3: Coverage of Non-Technical Issues by IS PM Texts

This is supported from another perspective on the issue: the relative attention given to these two aspects in the literature and at conferences. Themistocleous and Wearne (2000) carried out an analysis of the coverage given to various topics in the project management journals, and compared this result to a previous analysis performed in 1995. Their analysis reveals that the papers devoted to non-technical issues of project management published in the period 1990-1998 accounts for between 9% and 12% of the total papers, depending on the journal. This is approximately double the percentage
from the previous survey period, so an increase in attention to non-technical issues is apparent, but still remains low relative to the coverage of technical issues. These journals are generic project management journals, in that they are not specific to any particular industry, however, industry-specific articles are published: in 1990-1998, the construction industry was covered by 44%-53% of the articles, and the services, manufacturing and process industries by 39%-47% of the articles, while specific IS projects were not mentioned (although they may have been covered in generic articles). This further supports the contention that there is a significant gap between practice (insofar as the journals are concerned) and the rhetoric related to the importance of IS project management.

This result for publications can be compared to a similar survey on conference papers (Zobel and Wearne 2000) that shows some 19% of the presentations were primarily on non-technical issues. When an analysis of industry-specific papers is undertaken, the results are similar to the publication rate described above. The construction industry is represented by 23% of the papers, and the services, manufacturing and process industries by 62% of the papers. IS projects as a separate category did not rate any papers (however, the categories of “data processing” and “IT systems” are listed as sub-sectors of the services industry). When these two surveys are taken together, it is apparent that non-technical issues in general, and IS projects in particular receive little specific attention in the professional project management arena: the focus is on the technical aspects of project management as applied to well-established project types (such as construction projects).

Thus, despite an acknowledgement that organizational issues are important, the non-technical aspects of project management are receiving much less attention from both the academic community and the practitioner community. This apparent imbalance suggests the need for a revised framework for project management; one that, by virtue of its basic assumptions and theoretical form, leads to due attention being paid to all aspects of managing projects.
2.6 The Changing Organizational Landscape

The third area of interest in exploring the current state of IS project management is to look at the forces that arise from the changing nature of organizations at the start of the 21st century. The starting point for this discussion is the move from an industrial to a knowledge economy. The foundations of this shift are innovation and knowledge work, which require new organizational forms for their realisation. As a result, information systems are changing to reflect the new organization.

The move away from the industrial model of the firm to a knowledge-based model is seen as a natural progression from an agrarian economy (where production was centred on individuals), through an industrial economy (where production is centred on expensive infrastructure such as factories), to the knowledge economy (where knowledge is considered the key resource) (Tissen, Andriessen and Deprez 1998). The arrival of the knowledge-based society has forced organizations to change the way they do business: a move from control of physical means of production to enabling knowledge workers to use their knowledge in more creative ways (Rowley 1999).

The knowledge economy challenges the assumptions and practices of the industrial economy, involving a change of focus to people and their potential (Amidon 1998). This directly questions the primacy of established management orthodoxy, where return on investment, profits, efficiency and control are key ideas. In the knowledge economy, these ideas are joined (if not superseded) by a focus on the larger human condition. This is also a change to the way systems are conceptualised. In addition to having the provision of data in support of decision-making as a prime goal, systems will change so as to enable people to make significant contributions in the creation and use of knowledge (Bensaou and Earl 1998). With an increased focus on interpretations and meanings attributed by organizational actors to words and information, IS will need to change to assist in the exploration of alternative meanings and the reconciliation of different interpretations, and away from the rationalist view of IS as channels of communication (Tenkasi and Boland 1996).

This is the recognition of innovation as one of the key concepts of the knowledge economy. In order for innovation to have the best possible chance of occurring, a culture of trust and collaboration is required, as well as information systems that meet
both business needs and the knowledge-based needs of people (Amidon 1998). This is substantively different from the socio-technical view of current systems development approaches, which view people in terms of their use of information systems, rather than viewing information systems as complementing the needs of people (Bensaou and Earl 1998).

In addition to these large-scale sources of change to the way IS are viewed are changes from within existing organizational structures. New opportunities created by information technology require revised relationships between technologists, management and users (Applegate, McFarlan and McKenney 1996), recognising that information technology by itself does not produce benefits to a business, but does so through users (Ward, Taylor and Bond 1996).

In terms of the analysis framework used in the previous two sections of this chapter, these imperatives for a change in the way IS are seen is conceptualised as a force towards the collaborative/social-intervention area of the framework. It is suggested that a collaborative role for people in an organization (rather than a consultative role) is a consequence of the knowledge economy, involving sharing of knowledge and learning from others (Tenkasi and Boland 1996, Amidon 1998). The move to a social-intervention view of IS reflects the changing values implied by the knowledge economy (Tissen, Andriessen and Deprez 1998). Insofar as IS development (and therefore IS project management) reflects the role of IS within the organization, there is a force for change bearing on IS project management practice. The next section of this chapter examines the current state of knowledge in respect of IS development methodologies that are in concert with the collaborative/social-intervention theme.

### 2.7 People-Centred IS Development Methodologies

Seeking an IS project management approach that follows the collaborative/social-intervention theme is closely linked to a similar IS development approach. Many IS projects are concerned with the development of information systems, although some are not (for example, infrastructure projects): IS project management is focused on the management techniques used to realise the outcomes of the project, not on how the outcomes are achieved. However, a particular development methodology (for example
one that is based around the use of automated tools to record user requirements) will have an impact on the way the project is managed (in this example, through the management of the user relationships). This section examines the current research into IS development methodologies that are consistent with the collaborative/social-intervention theme.

The majority of the development methodologies have their genesis in concepts developed in the period 1967-1977 (Fitzgerald 2000), particularly the concept of the systems development lifecycle (SDLC) and user participation (Davis, Bersoff and Comer 1988, Wynekoop and Russo 1993). The adoption of the SDLC provided greater control over the development process (Friedman 1989). One form of user participation that gained favour from a number of developers was prototyping, and this became the basis of commercial development methodologies (for example, Boehm 1988). The use of prototyping was a response to the need to approach system design from both technical and social perspectives (the socio-technical view), in order to address the issue of non-acceptance of some systems by users (Cherns 1976). Despite this, popular methodologies (such as SSADM and structured methodologies (Downs, Clare and Coe 1992) and object-oriented methodology (Thomann 1994) continue to be technically oriented (Hornby, Clegg, Robson et al. 1992). With a change in the business environment requiring new methodological approaches (Fitzgerald 2000, Wynekoop and Russo 1997), organizational issues remain an important area of research.

The importance of the context of an information system has been recognised since the 1980s (Land and Hirschheim 1983, Callon and Law 1989, Avgerou 2001). In a study that looked at the different aspects of organizational issues, Doherty and King (1998) found no relationship between the perceived importance of a range of organizational areas and how the IT management treated them, leading to the recommendation that users and technical staff need to cooperate more closely. While not explicitly using the term ‘collaboration’, the need for organizational issues to be addressed on an equal footing with technical issues is clearly identified. This theme of a close relationship between the development of an information system and its organizational context is further explored by Avgerou (2001), who goes further in suggesting that the international, national/regional and local context of the organization must be taken into account when planning any technical innovation. When translated into development
methodologies, the issues related to context are often manifested in various forms of calls for ‘user participation’ in the development process (Cherry and Macredie 1999).

The term ‘user participation’ (also discussed as participatory or participative design) has a range of meanings (Asaro 2000). In terms of the analysis framework used earlier in this chapter, the uses range from instrumental through to collaborative. As an example of the former category, one definition considers the users as undertaking “specific design and implementation tasks” (Hartwick and Barki 2001, p22): user needs and concerns are addressed, but participation is in terms of a traditional development methodology. This is consistent with the historical roots of participatory design, Joint Application Design (JAD), wherein “the users’ influence on design is conveniently reduced to a well-structured functional input to the design process, a process which always remains in the control of the expert designers” (Asaro 2000, p264). At the other end of the spectrum, “socially oriented methodologies” (Coughlan and Macredie 2002, p47) see requirements as emerging through collaboration, challenging the view that requirements can be ‘captured’ through analysis, but rather “are derived from the situated actions of people within the workplace and only have meaning within that context” (Cherry and Macredie 1999, p108).

From the point of view of the theme of collaboration/social-intervention adopted for IS project management, this view of participatory design offers several useful ideas, as participatory design seeks to improve the work place, involve users at all stages of the project and recognises iteration as being necessary (Cherry and Macredie 1999, Gasson 1999). A methodology that incorporates many of the principles of participatory design is ETHICS (Mumford 1983), and this methodology has met with considerable success. Its more recent form (Hirschheim and Klein 1994) is closer to the philosophy of participatory design, however evidence of its success is not yet to hand. Soft-Systems Methodology (Checkland 1981, Checkland and Scholes 1990, Checkland and Holwell 1998) also incorporates many of the principles and results have been encouraging (Coughlan and Macredie 2002). In using development methodologies that adhere to the participative design philosophy, pragmatics (in the form of a dialectic of design and use) will be important (Asaro 2000), as will the economic and political conditions of the organization (Mumford 1997).
Other methodologies and supporting tools and techniques are being developed. One technique that focuses on the way projects are defined and designed is the technique of formal argumentation. In the project definition phase, argumentation has the potential to support multiple perspectives on issues, including the non-technical perspectives of managers, thus opening up possibilities for exposing the needs of a wide stakeholder community (Metcalfe and Lynch 2003). In a similar vein, an argumentative framework can be used during the design phase of an IS project (Metcalfe 2002).

It is evident that the participative design philosophy has much in common with the collaborative/social-intervention approach to IS project management that is the focus of this dissertation. However, there is a need to go beyond simply adopting the “user perspective” of participatory IS development, as information, and the systems concerned with information, affect the lives of people beyond those involved as designers and users (Ulrich 2001).

In an extensive analysis aimed at providing a framework for locating the variety of development approaches, Hirschheim and Klein (1989) proposed dividing IS development into three domains that IS impacts (technical, language and organizational) and the four orientations that researchers can adopt, based on Habermas’ social action types (instrumental, strategic, communicative and discursive). In the resultant matrix, both the organizational/communicative region and the organization/discursive region (which have much in common with the approach to IS development and IS project management advocated in this dissertation) are characterised by stakeholder mobilization, with the ideal outcome of informed decision making that incorporates democratic checks and balances (Janson, Cecez-Kecmanovic and Brown 2001, Hirschheim and Klein 1989). Whereas in the functionalist paradigm “Information systems are developed to support rational organizational operation and effective and efficient project management [where] the primary emphasis is on investigating means rather than discussing ends” (Hirschheim and Klein 1989, p1203), paradigms consistent with the organizational/communicative region and the organization/discursive region of the Hirschheim and Klein matrix cast the analyst as a social therapist, with an agenda based around assisting the stakeholders to achieve their potential.
This formulation of the theoretical IS development landscape (and by implication, the IS project management landscape) draws a clear distinction between ‘user participation’ and ‘user emancipation’. The former has been criticised as failing to take into account the political constraints present in many IS projects (Hirschheim and Klein 1994), and for allowing economic and strategic interests to outweigh the rights of the people involved (Deetz 1992). The call for practices that support the emancipation stakeholders in general (but users in particular) has been given the label *Emancipatory Information Systems Development* (EISD) (Janson and Cecez-Kecmanovic 2003), and is aimed at “providing the participants in the design process with the possibility to engage in critical examination, self-reflection, awareness of hidden presuppositions, and disclosure of the assumptions of the various participant perspectives” (Wilson 1997, p188). It is a small step to broaden this definition so as to characterise IS project management based on emancipatory principles in similar terms: “to provide the constituency of the project with an environment that supports critical examination, self-reflection, awareness of hidden presuppositions, and disclosure of the assumptions of the various constituent perspectives”.

The concepts of EISD can similarly be used to establish the concepts of an emancipation-based IS project management approach. There should be a commitment to an increased democratic self-determination and voluntary action, which may require that the existing hierarchical communication systems existing in the organization at large be replaced in the project environment by a more open communication systems (Wilson 1997). In addition to a change in the communication systems, there needs to be a place for consideration of social justice, due process and human freedom issues as part of the project processes (Hirschheim and Klein 1994), and be able to handle the changing working conditions and social behaviour that results from decisions made in this type of environment (Hirschheim, Klein and Lyytinen 1996). Importantly, the position that IS is concerned with both technical and organizational issues cannot be neglected, so there needs to be a recognition that while social knowledge can be labelled as value-laden, scientific knowledge is also grounded in the conventions of the society that produced it; that both reasoned argument and critique need to be reflexive; and that theory and practice must be intimately connected (Boudreau 1997). An IS project management approach grounded in emancipatory principles needs to be able to
challenge the reigning development dogmas, while recognizing the need to move beyond the ideal, to the practical.

In order to realise such an IS project management approach, it is not possible to ignore factors such as the economic context (Probert 1999), cultural factors (Kaye and Little 1996) and circumstances of limited resources (Hirschheim and Klein 1994). Nor is it self-evident that existing ways of mapping the social space onto the technological space are adequate: the use of narratives and metaphor may be more productive than the systems approach (Introna 1996). Thus, the call to be practical is at the same time a straightforward call for taking a pragmatic position in relation to organizational politics, and a call to be open to new ways of achieving project outcomes within these economic, cultural and political constraints.

When it comes to defining one or many methodologies that can be used within an emancipatory IS project management approach, two observations can be made. Firstly, there is a need to focus on the task and to develop an understanding of what they (the project team) are doing, rather than focusing on the tools being used (as is the common case with many existing system development methodologies) (Introna and Whitley 1997). Secondly, it may in fact not be possible to have any methodology that is capable of representing processes (and thus requirements) “exactly”: in a variation of the law of requisite variety, a practice is always richer than any formal representation of it (Tsoukas 1996). In the context of IS project management, these observations have an important implication: only through an understanding of what the situation requires can technical artefacts be created: it is not possible (in the general non-trivial case) to rely on a representation of what is required (that is, fully documented requirements are unachievable). Systems analysis (as a key process within IS projects) needs to once again recognize the distinctive nature of people, and not fall back on values and practices of technology and engineering (Mingers 1980, Probert 1999) that has dominated many systems analysis approaches for the past few decades. Therefore, an IS project management approach needs to be explicitly aware of this need to provide an environment that promotes an understanding on the part of those developing the system, and a way of sharing this understanding.
From this discussion on emancipatory information systems development as an alternative to the current ‘user involvement’ methodologies, a parallel change in the way IS projects are viewed can be envisaged. In this revised view, IS projects and their management become centrally concerned with people, especially in enabling them to more fully participate in the project’s processes that impact their organizational lives. At the same time, the realities of economics, organizational culture and organizational politics cannot be ignored. This adds up to a fundamental change in the way IS projects are managed.

2.8 The Need for a Change in IS Project Management Practice

The current state of IS development is summarised in Figure 2.3, which combines the discussions of Sections 2.4 (contemporary research), 2.5 (recommendations for practice), 2.6 (forces for organizational change) and 2.7 (people-centred ISD methodologies) into the analysis framework used for Figure 2.2.

Current research into IS project success and failure is located in both the technocratic/instrumental and socio-technical/consultative areas of the framework (as described in detail in Figure 2.2). This represents a recognition of the importance of people in IS development, however in a role that sees them as external to the project team that actually develops the system. In turn, this externality of the users reflects an acceptance of the aims of the development project before the users become involved: criticism of the aims is therefore likely to be unproductive. Recommended practice is co-located with the research, reinforcing the external role of users.

In the environment surrounding organizations and their information systems, forces arising from a change in the nature of the economy and society, and changes in the organizations themselves, are moving the focus even further: towards a collaborative/social-intervention conceptualisation of IS, IS development and IS project management as indicated by the arrow in Figure 2.3. This has been recognised by the development of people-centred ISD methodologies.
A theoretical framework for IS project management that reflects this evolving view of IS and IS development is needed, based on the analysis framework used in Figures 2.2 and 2.3. This need gives rise to the first research question of this dissertation:

1. What is a possible theoretical model of IS project management that reflects (or is grounded in) a collaborative/social-intervention conceptualisation of IS and IS development?

After exploring potential theoretical models within the collaborative/social-intervention framework, the question arises how such a model can inform and improve IS project management performance. Therefore, in order to assess the validity of this theoretical model and to address the overall aim of this research to improve project performance, the subsidiary research question is:

1A. To what extent does this theoretical model of IS project management provide a comprehensive framework for understanding and explaining IS project success and failure?
In seeking an answer to these research questions, a new IS project management approach will be developed, based on the characteristics of participatory design: improvement in the work environment, continual user involvement, and continual refinement of the information system (Cherry and Macredie 1999). The following section of this chapter critically examines potential IS project management approaches from the perspective of these characteristics as a starting point for the research that will be undertaken to answer the above research questions.

### 2.9 Possible Project Management Approaches

As has been established in Section 2.5 above, current IS project management approaches do not in general support the notions of participatory development: improvement in the work environment, continual user involvement, and continual refinement, although the principles of emancipatory IS development discussed in Section 2.7 offer some guidance as to what a new approach to IS project management would look like. Current recommended practice is based on engineering concepts: the task, although complex, can be sufficiently broken down into its constituents to enable the project to be completed step-by-step. The focus is on producing the technical artefacts, and the methods used include work breakdown structures, computer-based planning tools and time and budget as the main success criteria. Exemplars of this class of approach are given by all of the texts listed in Table 2.3 except for the text by (Thomsett 2002), and by the guidelines issued by the professional project management associations (Association for Project Management 2000, Project Management Institute 2000). The project commences with the initiation phase (project charter, scope and constraints), then through a planning phase, leading to tasks associated with execution and control, finally to project closure (for example, see Schwalbe 2002). From the perspective of the project manager, major concerns are the management of scope, time, costs and quality (for example, see Phillips 2002). There is a major reliance on estimation and scheduling, and then on monitoring and controlling these issues (for example, see Olson 2001). As discussed in Section 2.5, the people issues receive little attention. Project management approaches in this class do not generally have participatory development principles as their foundation.
By contrast, the principles of *Radical Project Management* (Thomsett 2002) do appear to embody the spirit of participatory development, especially in the notion of continual user involvement. In recounting the evolution of IS project management, Thompsett identifies the current stage as being one of partnership: “a shared recognition from both computing and business people of the need for a collaborative partnership based on professional behaviours” (Thomsett 2002, p9), and then goes on to advocate continual interaction between the project team and the stakeholders (see especially Chapter 21). From the perspective of the engagement/change model developed in Section 2.3, there is a conflict between the rhetoric of Thompsett and the implicit conceptualisation of the role of the stakeholders. Although stakeholder ownership and meaningful participation (Thomsett 2002, p23) are stated features of the project management approach (and is equated with collaboration), the project team (and especially the project manager) is still seen as being in control of the events in the project. In the definition of collaboration used in this dissertation, this is not “true” collaboration, as this requires that there is an equality of power between the users and the users.

The position of Thompsett on continual refinement of the goals of the project is somewhat ambiguous. On one hand, there is the principle of “meaningful user participation” discussed above and the recognition of continual change (Thomsett 2002, p58), yet the agreement of scope at an early stage is called for (Thomsett 2002, p81), and is instantiated in the lifecycle model used (Thomsett 2002, p66). This position on refinement reinforces the implicit power relationships discussed in the previous paragraph. Finally, in considering the goal of improving the working environment, Thompsett has little to say, beyond identifying the stakeholders as being responsible for realising business benefits (Thomsett 2002, p108). In summary, despite some features of the approach seeming to be in concert with the principles of participatory development, the Thompsett approach to IS project management only goes part of the way to being a full complementary project management approach for participatory development. Other candidate approaches need to be examined.

Project management “comprises the management of all that is involved in achieving the project objectives safely and within agreed time, cost, technical, quality and other performance criteria” (Association for Project Management 2000, p14). Although this definition from the Association for Project Management provides much scope for
debate regarding its correctness, it provides a convenient context for one of the keys to successful project completion, evaluation, and in particular continuous participative evaluation as applied to IS projects (Remenyi and Sherwood-Smith 1999). This approach to IS project management proposes an evaluation process that involves users, management and technical staff, and is based on the principle of frequent evaluation, resulting in an evolving understanding of the key features that need to be evaluated, in turn possibly leading to changing objectives as the project progresses. This is consistent with the collaborative/social-intervention theme of IS project management. In discussing how a formative evaluation process should be implemented, Remenyi and Sherwood-Smith (1999) focus on the metrics that underpin the evaluation process, particularly the Balanced Scorecard (Kaplan and Norton 1996).

The concept of the balanced scorecard has been used with much success by many companies in diverse industries (for example, Olve, Roy and Wetter 1999, Malmi 2001). Within the information technology (IT) industry, the use of the Balanced Scorecard concept has received much attention, for example, for enterprise resource planning (Rosemann and Wiese 1999). Within the information systems discipline, the balanced scorecard concept has been used as a base for developing management information systems (Martinsons, Davidson and Tse 1999), and to analyse a computer company (Wright, Smith, Jesser et al. 1999). More recently, the concept has been applied to the management of projects (Stewart 2001). The concept also has a wide exposure in the non-academic press and is promoted through a web site. Thus, much empirical evidence exists for its relevance in practice. However, despite these successes in practice, there has been some criticism (for example, Norreklit 2000) of its central assumption of a cause and effect relationship as derived from the perspectives.

In the Balanced Scorecard, four perspectives (financial, customer, process and learning and growth) are used to identify the objectives for (especially) strategic planning within organizations, and whether these perspectives are appropriate for IS project management is open to question. In implementing the balanced scorecard, additional perspectives have been proposed so as to define a scorecard that is focused on the particular needs of the developing organization (Olve, Roy and Wetter 1999). However, in making these extensions, the new or revised perspectives remain particular to strategic planning applications, and therefore are not in general universally applicable to
other applications. A generalisation of the balanced scorecard concept has been proposed (Brook 2000, 2001), which defines a Generalised Scorecard Model (GSM) as the basis for designing management perspectives for particular applications, and especially for IS project management. The IS project management approach that is derived from the GSM actively supports continuous refinement of participatory development in that it advocates a continual re-examination of the project objectives, and then cascading any changes through to the measures that are used in the management of the project, thus providing a continual check between the stated objectives of the users and what is being produced. Continual user involvement is supported through the use of objectives to drive the project, with the notion of collaborative teams being one of the descriptors of the project execution perspective derived from the GSM, while the improvement of the workplace is only indirectly included, through the recognition of the role of people in executing the project (Brook 2001, p53). Overall, this approach derived from the balanced scorecard is consistent with the principles of participatory design, especially in the role that objectives have in supporting the role of users. It is this focus on continual refinement of objectives by all of the participants that provides the basis for agreement between the members of the project team: although disagreements may arise, by continually revisiting the objectives and having stated and explicit measures during the execution of the project, all involved are aware of the implications of the differences in opinions and are thus more able to identify and resolve their differences.

Of the three classes of IS project management approaches discussed in this section, the one derived from the balanced scorecard offers an approach that is consistent with the principles of participatory development. None of the approaches reviewed have a theoretical basis; they are all grounded in practice. Therefore, in order to adequately address the first two research questions of this dissertation, a further research question arises:

2. What are the characteristics of an IS project management approach that is grounded in the theoretical model of IS project management?

Finally, in order to address the aim of this research (to improve the likelihood of project success), a subsidiary question then is:
2A. Does this IS project management approach increase the likelihood of project success?

2.10 Conclusion

This chapter lays the foundation for the research reported in this dissertation. Based on an analysis of current research and practice, political and economic imperatives for a change in IS development methods, and contemporary research in IS development approaches, a characterisation of features of a revised IS project management theory has been arrived at. These features are consistent with a collaborative approach to the involvement of people in a project, and a social-intervention view of the role of information systems in an organization.

Figure 2.4 The Research Questions of this Dissertation
The literature review presented in this chapter identifies a significant deficiency in theoretical foundations for an IS project management approach from the collaborative/social-intervention point of view. This represents an opportunity to develop a theoretical model of IS project management from this point of view, and to develop a project management methodology based on this model. Realising these opportunities through research will represent significant contributions to IS project management theory and practice. In order to focus the research required, four research questions have been posed, and are presented diagrammatically in Figure 2.4.

The next chapter of this dissertation describes and justifies the research methods to be used to answer these research questions.
Chapter 3: Research Methods

3.1 Introduction

The previous chapter laid the foundation for the research questions to be addressed in this dissertation, and concluded with four research questions being articulated:

1. What is a possible theoretical model of IS project management that reflects (or is grounded in) a collaborative/social-intervention conceptualisation of IS and IS development?

1A. To what extent does this theoretical model of IS project management provide a comprehensive framework for understanding and explaining IS project success and failure?

2. What are the characteristics of an IS project management approach that is grounded in the theoretical model of IS project management?

2A. Does this IS project management approach increase the likelihood of project success?

This chapter describes and justifies two research approaches that are appropriate for addressing these research questions and describes how each of these research approaches was applied in the research described in this dissertation.

The selection of appropriate research approaches was constrained by the twin realities of the resources available (in particular the research setting), and the time available to undertake the research. The opportunity was taken to locate the primary research phase in a commercial setting: the national headquarters of a major international insurance company (hereinafter called ABC Insurances), specifically in the department of the general insurance division concerned with the development and operation of the various systems used to run the business. One of the major responsibilities of this department was the establishment of a project management office that initiated and monitored the
various projects that were used to develop their business systems. This project was seen by the departmental manager as a way to improve the project management practices then in use.

The first research approach used was action research, which addressed research questions 1, 2 and 2A. The justification for this approach is developed in detail later in this chapter; in summary, this approach is the only approach that simultaneously links theory development with practice, and provides the opportunity to evaluate the methodology derived from the theory in a practical setting.

The time constraint particularly impacted how the remaining research question, question 1A, was addressed. As this research question is concerned with theory validation, the goal was to use a separate set of data as the basis for the research in order to establish validity beyond the action research setting. The data selected for this phase of the research was a set of readily available audit reports of troubled projects, which were analysed through a meta-study based on hermeneutics.

This chapter is organised as follows. The first section establishes the research as post-positivist, and the next section discusses the research approaches that are consistent with this philosophical viewpoint. Based on this discussion, the selection of action research for the first (primary) phase is justified, and a detailed description of how it was applied in this research provided. This is followed by a similar discussion on the use of meta-study based on hermeneutics as the research approach for the second phase of the research. Then follows a discussion on the relevance, rigor and reliability of the results obtained using these research approaches, and the chapter concludes with consideration of ethical issues.

3.2 Philosophical Foundations

There is no general agreement in the IS research community about research paradigms in the IS research community. However, a number of schemes for classifying the various approaches have been proposed. Fitzgerald and Howcroft (1998) distinguish between interpretivist and positivist approaches, while Guba and Lincoln (1994) propose four paradigms: positivism, post-positivism, critical theory and constructivism.
A widely accepted scheme defines three distinct philosophical viewpoints: positivist, interpretivist and critical (Klein and Myers 1999, Myers 1997).

Positivist research is a suitable approach if there exist testable hypotheses, quantified variables, and the ability to draw inferences about a population from a sample of that population (Orlikowski and Baroudi 1991). More generally, positivist research is based on a belief of a universal truth waiting to be discovered by detached, neutral and objective researchers who conduct experiments in order to test hypotheses (Neuman 2000, Kock, McQueen and Scott 1997). In the social sciences, objectivism developed in the 1920s as social sciences modelled their research methods on the natural sciences. This approach became entrenched as funding bodies favoured research that appeared to be “professional”. In contemporary IS research, research methods grounded in a positivist philosophy dominate the academic literature (Rademacher 2001).

For IS research to be classified as interpretivist, the underlying assumption is that social reality is constructed out of the combined attempts at sense making by the actors, and that the social constructions used to facilitate this sense making may mean different things to different people (Kaplan and Maxwell 1994). The key idea in this approach is that this approach is "aimed at producing an understanding of the context of the information system, and the process whereby the information system influences and is influenced by the context" (Walsham 1993 p4-5). With its focus on understanding human thought and ways of thinking in social (including organizational) contexts, interpretive research has the potential to especially contribute to those areas of IS research concerned with people (such as in IS development) (Klein and Myers 1999), addressing the key criticism that interpretivist social science makes of positivism: the failure to consider the feelings of thinking people (Neuman 2000).

Critical IS research seeks to identify conditions that prevent people reaching their potential, and to reveal otherwise hidden agendas that adversely affect people (Alvesson and Willmott 1992, Hirschheim and Klein 1994, Ngwenyama and Lee 1997). Of particular importance to this stance is the assumption that people can consciously act to change their circumstances, albeit within social, political and cultural constraints (Myers 1997). Critical social science agrees with the criticism made of positivism by
interpretivists, but also criticises interpretivists as being too subjective, relativist, amoral and passive (Neuman 2000).

These three philosophies represent 'ideal types', and there is debate as to whether they must be adopted in isolation, or can be combined in a particular piece of research (Myers 1997). Contemporary research practice in IS is towards a pluralist approach (Mingers 2001a). The research questions being considered in this section are concerned primarily with theory and methodology development, based in practice. In line with the definition above, the positivist approach is therefore not appropriate. In the interpretivist tradition, the research methods adopted are aimed at uncovering how information systems influence, and are influenced by, the context (Walsham 1993). Critical research is more concerned with a critical analysis of the situation, in order to expose constraints and limiting behaviours: it seeks to be emancipatory. In the research described in this dissertation, elements of both the interpretivist and critical approaches are present.

That there are elements of the interpretivist approach that are applicable to the research described in this dissertation is evident from the environment within which the research takes place. The locale for the research is a large insurance company that became involved in the research through an explicitly articulated aim to continually develop their project management methodology. The research situation therefore had constraints that affected the choice of research methods. In particular, the company was keen to ensure that research outcomes were relevant to the way they operated, especially insofar as their staff were organizationally involved in projects. That is, the context of the research (from the point of view of the company) was a key characteristic, both in how any resultant methodology would affect their mode of working, and how their current operations would affect the theory and methodology.

The critical perspective on the research comes from my own background on managing projects, and is also apparent from the development of the research questions presented in the previous chapter. A key theme from these influences is the role of people in projects. In particular, the collaborative role, whereby those affected by systems are ultimately the ones to determine the shape of the system (essentially through the way the development projects are conducted), is seen as the way for people to take control of their work situation. In terms of the critical approach to research, this view of people is
consistent with the emancipatory principles of the critical approach: the desire to develop a theory of IS project management that recognises this collaborative role of people.

There is thus a tension between two forces, arising from the different agendas and background of the research situation and myself. Yet, it is not evident that these need to be incompatible: the resolution of the tension can arise from an appropriate choice of research methods, as one method can be compatible with various philosophical approaches (Myers 1997). This position is consistent with the argument that research epistemology is essentially a choice between positivism and anti-positivism (Markus 1997), or between positivism and post-positivism (Hirschheim 1992). The resolution of the tension between the interpretivist and critical approaches may also be found in the two aspects of the research: on one hand there is the development and testing of the methodology (in the organizational domain of the host organization), and the development and testing of theory (in my domain as researcher). With care, these two aspects can profitably inform each other (Mingers 2001a). Therefore, the goal in selecting research methods is to enable these two tensions to co-exist.

3.3 Research Framework

This research is qualitative, in that it “produces findings not arrived at by statistical procedures or other means of quantification” (Strauss and Corbin 1998, p10-11). In the social sciences, qualitative research is an accepted research approach (Patton 1990, Miles and Huberman 1994, Neuman 2000), and is therefore appropriate to IS research, as IS as a discipline includes the social setting, (Fitzgerald and Howcroft 1998, Lee 2001, Robey 1996, Rademacher 2001). The selection of research method(s) is therefore from the suite of methods that are applicable to qualitative research, subject to the conclusions relating to the tensions between agendas described in the previous section of this chapter.

In seeking a framework for the research, it is necessary to consider the reasons why we, as researchers, theorize. Proposed reasons include theories as being the first step in liberation from power and oppression (Habermas 1973), that is, part of a political process (Marshall 2001), for the systemic examination and the creation of knowledge
(Calhoun 1995), and to be able to explain and predict (Strauss and Corbin 1998). The term "theory" has been used in the sense of providing a general explanation of data and observations. It has been proposed that a theory has three defining characteristics: generality, accuracy and simplicity, but not all at the same time (Weick 1984). In practice, it is necessary to concentrate on any two of these. For research into IS project management, the question arises as to which is sacrificed: there are three possibilities.

If generality is seen as being less important than accuracy or simplicity, the result may be a theory that is restricted in its application, that is, can be used in only a limited range of circumstances. General and simple theories may take on the characteristics of describing overall characteristics without saying anything about particular projects, that is, lack predictive power for particular projects. On the other hand, general and accurate theories are characterised as requiring complexity, a feature that may deter application. One possible compromise is to undertake a process of refinement, focusing on different aspects of the theory at different stages of theory development: "I take the initial general simple explanation and make it more accurate, which necessitates further qualification, differentiation, and specification of boundary conditions - all of which involve greater complexity" (Weick 1984 p117). This approach to theory development casts the theory as a somewhat flexible thing: something that changes its form as it is developed. If this view is adopted, then it follows that a theory cannot ever be considered to be "correct", rather it is always in a state of change, hopefully changing towards a theory that has increasing predictive power. This view of theory development is in line with the idea of conceptual laws (Schwartz and Jacobs 1979). In this view, conceptual theories are used as explanatory frameworks during attempts by the researcher to discover where the boundaries of the theory require revision.

A common, though generally implicit theme, is that theory is developed in order to, in some way and at some time, affect what happens in the world, and it is this theme that forms the basis of the framework used to select the research methods used in this research. Therefore, the framework adopted in this research is based on a model that differentiates methods on the basis of the role of change to practice that results from theory discovery. Theory has several roles in research, including: to guide the selection of data to be collected and act as a unifier in analysis (Sawyer 2001), to enable new and different types of questions to be asked (Calhoun 1995), to codify understanding in
abstract terms (Markus 1997), to generate general principles (Weick 1984) and as a basis for informing practice (Benbasat and Zmud 1999). Related to this last use of theory is linking theory with practice, that is, specifying how to achieve predicted outcomes via a series of steps (Patton 1990), in terms of a mediating discourse linking the discourses of theory and practice (Gustavsen 2001). Checkland and Holwell (1998) explicitly recognise that research involves using a methodology based on a set of ideas to investigate an area of interest. This linking of theory and practice is referred to in this dissertation as a ‘methodology-for-use’ (as distinct from a ‘research methodology’). It is a recognition that theories are not applied in practice directly, but through an interpretation of the theory into a structured set of prescriptions for action. A model for the relationship between theory, methodology-for-use and practice is shown in Figure 3.1.

![Figure 3.1: Model of Research](image)

The model of the relationship between theory, methodology-for-use and practice as shown in Figure 3.1 identifies three pairs of relationships. Methodology-for-use is modelled as being derived from theory: a formal representation (in the form of models, guidelines or directions) may be implicit in some circumstances (simple theories may not have a methodology-for-use formally expressed). This methodology-for-use is then applied to the real-world setting to effect some activity, reaction or behavior. Observation, recording or measurements are made of the real-world setting, and these
used to gain an understanding of the real-world setting in order to develop a theory through a process of abstraction or induction. The resultant theory is then used to commence another cycle.

The model does not imply any time constraints, but represents a long-term view of the research process consistent with a role of theory seen as being directed at changing practice. In any particular time-frame, only one or two of the relationships may be traversed. For example, a methodology-for-use may be applied to a real-world situation and the resultant effects used to generate or modify theory – this may be the case where an existing methodology-for-use, such as Joint Application Design, is applied in a novel setting in order to further develop theory. On the other hand, the full cycle may be traversed several times in one research project to develop theory from practice.

In the quest for a framework for the research, one particular traversal, that between practice and theory, is especially important. This traversal represents the observation, recording or measurement of the existing setting in order to develop or modify theory: the stated aim of many research endeavours. The output from this research may be published, so that others become informed of the work. The revised theory is used by another to develop a modified methodology-for-use so as to affect practice. Another research project assesses this setting, and so on through the cycle. This traversal can be further subdivided by using the distinction between a stimulus-action research orientation rather than passive observation (Baskerville and Wood-Harper 1998). Passive observation requires a structure for assembling the observations so that theory can emerge, whereas a stimulus-action approach provides a framework based on change as a result of the intervention.

If the single traversal between practice and theory represents the minimal use of the model, then a research project that traverses the cycles several times in the same research project represents the other extreme. In this use of the model, there is a continual effect of practice influencing theory, which influences methodology-for-use, which affects practice, and so on around the cycle, possibly several times before the project ‘stops’ in order to publish for a wider audience.

This model can be used as a classificatory framework for the various research methods that are candidate methods for the research described in this dissertation. These research
methods cover a broad spectrum of qualitative IS research, however, there is some confusion in the literature between the terms ‘research philosophy’, ‘research method’ and ‘mode of analysis’. For example, grounded theory could be considered as a mode of analysis rather than a framework for undertaking the research (that is, a research method) (Myers 1997). While the mode of analysis (how the data is treated to reveal information pertinent to the research) is selected in the context of the adopted research method, it is necessary to recognize that there are no accepted definitions of ‘research method’ versus ‘modes of analysis’, and therefore no clear-cut distinction between the two terms. In this dissertation, the term *research framework* will be used to refer to the research philosophy, research method or mode of analysis. A more detailed discussion is provided for the specific research philosophy, research method(s) and modes of analysis adopted in this research in subsequent sections of this chapter.

In the following sub-sections, each of the major qualitative research frameworks are identified and defined, example research that uses the particular research framework described, and the classification of the research framework in terms of the model specified. In addition, a discussion regarding the value or application of each method is provided on how that framework (if selected) could be applied to the research described in this dissertation. The research frameworks discussed are those suggested by the literature as being generally applicable to qualitative research in IS (for example, see Myers 1997, Trauth 2001, Clarke and Lehaney 2000, Lee, Liebenau and DeGross 1997).

**Ethnography**

Ethnographic research has its roots in anthropology and seeks to understand the culture of the group being researched (Patton 1990). In the IS context, it looks at the cultural and social contexts of IS as an insight into the social construction of frameworks for understanding meaning (Harvey and Myers 1995). There are a number of types of ethnographic research, including holistic (deep immersion in the culture), thick description (a focus on language, images, institutions and behaviours), critical (uncovering hidden agendas and power structures), and reflexive (reflecting the researcher’s interaction with the object of study) (Schultze 2001). Ethnographic research methods have been applied to explore the political aspects of IS development.
(Myers and Young 1997), and to understanding knowledge work practices (Schultze and Boland 2000). In terms of the research model, this framework is an instance of the traversal between practice and theory. In the context of the research questions addressed in this dissertation, adopting an ethnographic approach would enable a detailed understanding of the organizational setting of the host organization: the stated aim of improving current IS project management practices could be achieved by gaining a thorough understanding of the organizational environment.

**Grounded Theory**

Research adopting grounded theory as its method is concerned with developing theory that was derived from the data, through a close and continual relationship between the data and analysis, without any preconceived theoretical position (Urquhart 2001). In IS research, grounded theory provides a useful method for generating explanations of phenomena that are based in an understanding of the context (Myers 1997). Studies using grounded theory include a study that developed a theoretical framework for conceptualising issues related to organizational change when CASE tools are adopted in systems development (Orlikowski 1993), and a study of Ireland’s information economy (Trauth 2000). In terms of the research model, this framework is an instance of the traversal between practice and theory. In the context of the research described in this dissertation, grounded theory offers the opportunity to develop a theoretical model of IS project management from the practice of the host organization.

**Action Research**

Action research is “a participatory, democratic process concerned with developing practical knowing” (Reason and Bradbury 2001). In being concerned with practical matters, it seeks to bring together theory and practice in an environment of collaboration between researcher and those in the research setting, with a commitment to add to the body of knowledge (Myers 1997). Several types of action research have been defined, with a scheme that distinguishes between technical action research (to discover a more effective or efficient process), practical action research (to improve practice through improving the practical skills of those involved) and emancipatory action research (to change the actions of the participants away from traditions, precedents and power relationships) (Grundy 1982) being useful distinctions, as it highlights the diverse
nature of this research approach. In terms of the research model, this framework is an instance of the ‘theory to practice to application to revised theory’ cycle. In IS research, action research methods have been applied in the development of software and systems, the use of information and in information system design (Lau 1999). Examples of IS research that have used an action research method include a study of a Manufacturing Information System with a view to solving technical and organizational problems (Grant and Ngwenyama 2003), and a medical information system that involved political issues during the project (Chiasson and Dexter 2001). For the research described in this dissertation, action research offers the opportunity to develop theory and improve practice at the same time.

Critical Studies

Critical researchers regard social reality as historically constituted and produced and reproduced by the actions of people (Myers 1997), and that the process of critical inquiry is centrally concerned with discovering hidden agendas and inequalities (Cecez-Kecmanovic 2001). Two examples of IS research from a critical perspective have had computer-mediated communication as their focus, especially electronic mail (Ngwenyama and Lee 1997, Cecez-Kecmanovic 2001). Approaching systems development methodologies from an emancipatory perspective has been proposed as a way of ensuring that the social aspects of IS are explicitly catered for in the development process (Hirschheim and Klein 1994). In terms of the research model, approaching the research from a critical perspective is compatible with other research frameworks discussed in this section: it could be used with action research (as the philosophical foundation for theory development), or as the perspective from which to analyse case studies; however, it is not compatible with frameworks such as hermeneutics and phenomenology, which have their own philosophical grounding. Approaching the research that is described in this dissertation using a critical studies method offers the opportunity to focus on the participants of the IS projects, as well as consider the broader organizational aspects of any enhanced methodology.

Case Studies

A case study approach to research is concerned with studying phenomena in their real-life contexts, especially when the context is an important part of the study (Yin 1994).
This approach can be applied to IS research, as IS research is concerned with the organizational context of systems (Myers 1997), and guidelines for improving the effectiveness of the method have been published (for example, Darke, Shanks and Broadbent 1998). Case studies have been used extensively in IS research, from the seminal study into problems with implementing management information systems (Markus 1983), through a detailed study of a failed government information system (Sauer 1993), to a study of changing perception of IS success and failure (Larsen and Myers 1999). In terms of the research model, this framework is an instance of the traversal between practice and theory. A case study approach to addressing the research questions posed in this dissertation would require several organizations to be involved in the research program. However, as the case study method is primarily a discovery method leading to theory, rather than changes-in-practice leading to theory development (intervention), it does not address the main aim of the research questions.

Hermeneutics

The term ‘hermeneutics’ is used in two different (though related) ways when talking of IS research. Firstly, it is a philosophical position, often associated with the interpretivist approach to IS research (Myers 1997): in this context, hermeneutics seeks to understand “the conditions under which the human act took place or a product was produced that makes it possible to interpret its meanings” (Patton 1990, p84). Secondly, it is a way of approaching the analysis of data, seeking to understand the meaning of texts (broadly defined to include any representation of the situation) in order to make sense of the text, based on the interpretations of the researcher (Patton 1990). Examples of IS research using hermeneutics include a study of managers as producers of meaning from electronic mail (Lee 1994) and the use of hermeneutics to interpret a case study of a government department (Myers 1994). In terms of the research model, hermeneutics presents as a way of traversing the ‘practice to theory’ link. For the research described in this dissertation, hermeneutics provides a potential method for analysing evidence that could be used to assess the validity of the theoretical model developed as part of the research.
Phenomenology

In a manner similar to hermeneutics, phenomenology refers to two different issues in IS research. Firstly, there is the phenomenological perspective, which relates to the methods used to capture people’s experiences and is a philosophical basis for interpretive research, and secondly, in terms of a phenomenological study, where the defining characteristic is the experience of the essence of the phenomenon by the researcher (Patton 1990, p70). This latter usage leads to phenomenology as being the philosophical foundation of the participant observation method of research: the researcher is intimately involved in the research in order to describe what people experience and how they experience it. An explicit example of the use of a phenomenological viewpoint is the study of the issues surrounding the design of decision support systems for marketing (Buttery and Buttery 1991). More recently, phenomenology has been used to analyse the apparent lack of relevance of academic work in IS to practice (Ciborra 1998), and as the basis for an approach to IS that recognizes the importance of the body in human cognition and social action (Mingers 2001). In terms of the model of research, phenomenology informs how the data is collected, that is, through a close engagement of the researcher. For the research described in this dissertation, initiating a phenomenological study would involve myself being fully part of the practices being studied: a participant observer.

The selection of a research method should be driven by the nature of the research problem (Trauth 2001) and by research objectives (Mingers 2001a, Robey 1996). Therefore, in the research described in this dissertation, the first group of research questions (Questions 1, 2 and 2A, concerned with theory development and methodology development and testing) is most appropriately addressed by action research. Of the methods classified using the model, it is the only method that specifically addresses the three aspects of theory development, methodology development and methodology testing. An alternative is to initiate a phenomenological study, however, this was not a viable alternative given the time commitment required to become immersed in the project that was used in the research. Continuing with the principle of a close association between systems development methodologies and IS project management approaches discussed in the previous chapter, then “action research is one of the few valid research approaches that we can legitimately employ to study the effects of
specific alterations in systems development methodologies in human organizations” (Baskerville and Wood-Harper 1996).

For the second research question (Question 1A, concerned with testing the theory developed independently of the setting used for theory development), a method from the practice-theory traversal in the model is an appropriate choice. One choice is the use of grounded theory, however this requires that no theoretical position be adopted: the theory has to emerge from the data; this is not the case in this research, as the goal is to test (in the sense of validating ideas and concepts) the theoretical model developed during the action research project. Ethnography is inappropriate for practical reasons: a detailed study of the organizational setting was not possible in the time available. Therefore, an approach based on hermeneutics was chosen: meta-study. This approach provides a framework that explicitly uses text analysis: the data used for this part of the research was a set of documents describing problems associated with IS projects. In this application, hermeneutics is used to analyse the data that is the focus of the meta-study.

Having justified the research methods to be adopted in this research, each of the selected methods (that is, action research and meta-study) is discussed in detail in following sections of this chapter, where the specific way each method was applied is described and justified.

3.4 Part 1: Action Research

The use of action research in information systems research can be traced to the work of Kurt Lewin in the 1940s (Baskerville and Wood-Harper 1998) in the social sciences. In the information systems discipline, the use of action research in the application of information systems begins to be apparent in the 1980s, with the development of ETHICS (Mumford 1983), and Soft Systems Methodology (Checkland 1981), which also draws on systems science for its foundations. At this time, discussion of action research as a research method also began (Wood-Harper 1985). Since this time, the use of action research as exemplified by publications has been steadily increasing (Lau 1997), as has the debate on its use as a research method (Baskerville and Wood-Harper 1998, Baskerville 1999). Despite lingering reservations by some researchers, action
research is now accepted as a legitimate research method for information systems (Mumford 2001, Lee 2001, Baskerville 2001).

The theory/methodology-for-use/practice scheme as shown in Diagram 3.1 is a convenient framework for defining the process model of action research that was used in the research described in this dissertation. In particular, the ‘theory’ component can be equated to the principles of action research, the ‘methodology-for-use’ component equates to the process model of action research that was used, and the ‘practice’ component equates to how the process model was applied in this particular research. The following sub-sections describe these three components of the action research method as it was used in the research described in this dissertation.

**Principles (Theory)**

Broadly defined, the principles of action research relate to the worldview of those who use the method in their research and to the assumptions that are implicit in this worldview. Fundamental to this worldview is the belief that organizations, the events that occur within organizations, and the people that make up organizations, form a complex social system that is not amenable to deconstruction: it must be studied and understood as a whole (Baskerville 2001). Therefore, the research methods used to study these social systems cannot be based on the identification, isolation and measurement of its components: the research methods tend to be specific to the problem, people and the organizational setting (Patton 1990). In the ideal situation, the researcher is actively involved with the organization in addressing the people, with the aim of linking theory and practice (Baskerville 1999).

The term ‘action research’ is used in a number of different contexts (Lau 1997). As used in this dissertation, action research is “a participatory, democratic process concerned with developing practical knowing” (Reason and Bradbury 2001). A closely related term is ‘action science’, a variation of action research that places emphasis on understanding the participant’s behavior as expressed by theories-in-use versus their beliefs, expressed as espoused theories: research in practice (Argyris, Putnam and Smith 1985). Participatory action research shares the responsibility of the research between the researcher and the participants (Baskerville 1999), and may have an emancipatory dimension (Eden and Huxham 1999). Learning through an action research-type project
in order to increase professional skills of a group or by individuals as self-development is termed ‘action learning’ (Eden and Huxham 1999).

Two key characteristics of action research as used in this dissertation are that it must be rigorous and action-oriented (Eden and Huxham 1999), the ‘double challenge’ (Avison, Baskerville and Myers 2001). Lau (1997) proposes a framework for undertaking action research based on type and focus (action research, action science, participatory action research, action learning), the underlying assumptions (interpretive, critical, organizational design), the process used (research theme, level of organization, extent of change, researcher role), and method of presentation (full case study, short case study, essay). An alternative framework is proposed by Baskerville and Wood-Harper (1998), who focus on the process model being used (iterative, reflective, linear), the structure (rigorous, fluid), the researcher involvement (collaborative, facilitative, expert), and the goals of the research (organizational development, system design, scientific knowledge, training) as the basis of the framework. These frameworks provide a number of common themes for action research (rather than action science, participatory action research or action learning).

These themes include the organization of the research (in terms of formality and process), the role of the researcher (collaborative or facilitative) and the explicit dual nature of the research activity (action-orientation and research). Many action research projects involve an external researcher entering an organization for the duration of the research, thereby requiring some form of agreement between the organization and the researcher in order for the project to proceed as smoothly as possible. To achieve this, it has been proposed that formal control structures surrounding the project be established (Avison, Baskerville and Myers 2001). In terms of process, the key issue is whether to adopt a linear approach or an iterative approach. This is related to the fundamental idea of learning from practice, that is, being able to use learning to change practice during the project. This gives rise to the notion of iterations of the action-learning process. As discussed in relation to the theory/methodology-for-use/practice model of Figure 3.1, there is an explication of the larger picture (theory) in terms of smaller elements (methodology-for-use) in order to undertake an activity in an organizational setting (practice). Where there are multiple iterations involved, this is then a continual move from the larger picture to the smaller elements and back to the larger picture in order to
increase understanding, the basic concept of the hermeneutical circle (Susman and Evered 1978). The role of the researcher as collaborating with the participants (Baskerville 1999) from the organization implies that the twin goals of the research are understood and adopted by the research team. These twin goals (organizational development and increased knowledge) mirror the action and change orientations.

**Process (Methodology-for-use)**

A process model that incorporates these themes has been proposed by Susman and Evered (1978), who specify a five-stage process occurring within an organizational arrangement termed the client-system infrastructure. In this model, the five stages identified are: diagnosing (identifying the problem that is to be addressed), action planning (determining how the problem can be addressed), action taking (in the organizational setting), evaluating (determining effects), and specifying learning (developing or modifying theory). A similar process model that has been used to investigate bicultural differences used planning and reconnaissance, action, observation, reflecting and replanning as the five stages (Gordon 2001). In a critique of these models, McKay and Marshall (2001) studied four action research process models (McKay 2000, Susman and Evered 1978, Burns 1994, Checkland 1991) and showed that they all involved one type of cycle, even though iterations may be involved. McKay and Marshall (2001) then differentiated between the cycle involved with solving the organizational problem and the cycle involved with knowledge acquisition, and recommended that the research techniques used in each of the cycles (which take place concurrently) be explicitly identified. Therefore, although the cyclical process model can be applied to action research, its usual formulation as a series of stages needs to be overlayed with explicit recognition of the two agendas for the research through the selection of appropriate research techniques. With this recommendation to recognise the two parallel activities in action research in mind, the stages used in the research described in this dissertation were situation diagnosis and theory framework evaluation, planning, application to practice, evaluation and theory modification.

As a context for the five stages, the ‘research environment’ was defined, based on the idea of the client-system infrastructure of Susman and Evered (1978), but also incorporating the ideas relating to control structures of Avison, Baskerville and Myers.
(2001). The purpose of establishing the research environment was to ensure that organizational arrangements were in place, including agreements relating to intellectual property, provision of resources for myself as researcher, agreed timescales and reporting lines, and overall aims of the project. The first stage, situation diagnosis and theory framework evaluation extends the diagnostic phase to include (in the first iteration) the statement of the theoretical framework to be used in this iteration, following the recommendation of Checkland and Holwell (1998) to have a declared position to act as a starting point for applying the various methods employed in the project. The other four stages follow the definitions given by Susman and Evered (1978), subject to the need to explicitly identify the research techniques applicable to each of the project agendas.

The adoption of an iterative process model, a rigorous set of stages for the process, the explicit identification of the researcher as having a collaborative role and goals of organizational development and knowledge acquisition, classify the research project described in this dissertation as an example of canonical action research (Baskerville and Wood-Harper 1998). The specific way in which the guidelines were applied in the research described in this dissertation is described in detail in the following sub-section of this chapter.

Application (Practice)

This sub-section describes how the five-stage cyclical process model, performed within the available research environment, was applied in the research described in this dissertation.

Establishment of the Research Environment

For this project, my entry into the organization was facilitated by a colleague, who disseminated working papers to relevant parties, and performed necessary preliminary introductions. Discussions then took place between the manager of the department within which the research was to occur and myself. This established the basic rapport needed to commence the research, and others were brought into the research project by this manager. These others became involved either through their managerial responsibilities or through their professional (mainly technical) interest in the research.
Although the value of the proposed research was acknowledged, and they were committed to the research, detailed work with a chosen project would be necessary to answer their questions and issues.

At this point, the basic protocols regarding intellectual property were established, with the major issues being the right of the host organization to adopt the methodology if they saw fit (agreed), and my right to publish results provided identifying material was removed (agreed). Agreement was reached on the basic timeframe for the research, and on housekeeping issues such as accommodation and computer facilities for myself as researcher.

An oversight committee for the project was established, consisting of the departmental manager, the manager of the program office (who was responsible for project management within the division) and two senior technical staff members. This committee was formed so as to ensure ongoing satisfactory project performance, so as to provide visibility within the organization of the project. The project involved had an internal cost of approximately AUD120,000, but the projected cost savings to the organization as a whole over the coming years was in excess of AUD1 million per annum. There was therefore a high degree of motivation on the part of the oversight committee to ensure that the research as conducted was carried out satisfactorily.

Stage 1: Situation diagnosis and theory framework evaluation

In this part of the research program, the first iteration involved meetings with the manager of the program management group (who had overall responsibility for projects in this division of the organization) and the technical advisors in the program management group to discuss the way the model proposed by myself could add to the effectiveness of their project management methodology. These meetings resulted in the selection of a particular project (hereinafter called the XYZ Project) as the project that would be the trial project. A tentative time frame of seven months was established (detailed planning had not yet commenced on this project). In subsequent iterations of this phase, the oversight committee discussed the progress to date, suggested changes to how the measures developed were reported and acted upon, and addressed any organizational issues. Three such meetings were held.
As the basis for the initial phase, Checkland and Holwell (1998) highlight the need for action research projects to have an initial, explicitly stated, starting position. The purpose of this is to provide a focus to the research, by suggesting where to look for issues relating to the problem under consideration. In this research project, an initial methodology based on the Balanced Scorecard fulfilled this role. A description of this methodology is attached as Appendix A. It enabled the scope of the research to be discussed in terms specific to the XYZ Project, and an understanding of how the phases of action research would be applied. As the preliminary methodology was based on the Balanced Scorecard, the basic concepts were familiar to the participants, as the balanced Scorecard was in use for planning purposes throughout ABC Insurances.

In subsequent iterations of this stage, an assessment of the progress of the research in regard to a revised project management methodology-for-use for ABC Insurances was made, and opportunities for further development of the methodology-for-use identified. These opportunities arose out of an analysis of the theory that was being developed by myself primarily during the fifth phase of the action research cycle, an analysis that informed further developments of the methodology-for-use that could both improve the methodology-for-use to date, and therefore enable further development of the theory.

**Stage 2: Planning**

This stage involved operationalizing the methodology-for-use developed from the preliminary methodology and preparing a detailed plan for Project XYZ. In the first iteration, a number of working sessions were held to work through the methodology-for-use and develop a first list of objectives and measures to be used in Project XYZ. Procedures were incorporated into the project plan to collect the data required to calculate the measures defined. In subsequent iterations, one (and occasionally two) meetings were held to review progress and to assess the value that the measures were adding to the management of the project. As a result of these discussions, some changes to the set of measures were made.

In the second and third iterations, additional tasks were identified and incorporated into the research project plan. These related to the (organizational) goal of disseminating revised methodology-for-use to as wide an audience within ABC Insurances as possible. To this end, tasks were identified that resulted in the preparation of a manual that
detailed the methodology-for-use as derived from the initial methodology, and as subsequently modified as a result of the iterations of the five stages of the action research process model.

Stage 3: Application to Practice

Applying the methodology-for-use to practice within the XYZ Project involved the project manager collecting and analysing the measures agreed to, and taking appropriate action based on the analysis. This action occurred both at the project level (interactions with the project stakeholders), and with the project management team, who also were provided with the measures being used. In the first iteration, the major activity in the XYZ Project was planning, so there were minimal actual measurements to be acted upon. However, in the second and third iterations, a number of the measures resulted in action that would not have been otherwise taken – the specific measures involved and the subsequent actions are explained in detail in Chapter 4 of this dissertation.

Stage 4: Evaluation

In this research project, the evaluation of how the methodology was being used and its effectiveness sometimes overlapped with the planning of how modifications could be incorporated and the explication of the learning that had occurred, that is, the fourth and fifth stages of one iteration and the first phase of the next iteration occurred essentially concurrently. This occurred for mainly pragmatic reasons, as the time commitments of the participants were such that scheduling meetings that would only look at one of these stages was not feasible. Additionally, the discussions were free-form, in that although there was an agenda for the meetings, it was not considered appropriate or necessary to curtail discussion on, for example, an issue, its solution and its effect on the methodology simply to segment the stages of the model. Nevertheless, it is possible after the event to identify the various activities that occurred in the meetings as examples of the action research process model in use.

Stage 5: Theory Modification

The fifth and final stage of the model is the recognition, evaluation and adoption of the learning that occurred as a result of each iteration: the lessons learned. In this research
project, the main form of the learning for the project team was the increased understanding of how the methodology could be used in various ways in the project, and, in parallel, the development of the theoretical model. Specific outcomes of this stage are detailed in the following chapter of this dissertation, however it is useful to note that the input from the project manager and the technical staff of the project management group provided a rich source of ideas that were subsequently incorporated in revisions of the methodology-for-use.

In the research program reported here, the manager of the project management group had a concern about replication of results when I was no longer in attendance. This aspect of the learning process has not received much attention, however it is likely to be a major concern (as it was in this research) if the action research project is essentially a pilot project for the organization. This aspect of the learning activity was added to the research project plan by the research team.

As an action research project, two sets of data collection and analysis methods were employed, in line with the recommendation of McKay and Marshall (2001) to explicitly recognise the two agendas at work in an action research project. This sub-section details the data collection and analysis methods used for the XYZ Project to enable the organizational goal of a revised project management methodology-for-use to be achieved, and the methods used to enable the research goal of theory development to be realised. In practice, some data was applicable to both goals.

Data Collection and Analysis for the Organizational Goal

The primary outcome envisaged was a modification to the existing project management approach of ABC Insurances, specifically the incorporation of the measures-based approach that is implied by the preliminary methodology and subsequent theory development. To this end, the main data used to evaluate the value of the methodology-for-use was the measures identified by applying the methodology-for-use and the assessment by the project manager of the value of those measures in managing the XYZ Project. Therefore, the data collection consisted of computer files and documents produced during the project, interviews with the project manager and notes of discussions by the research team.
The computer files and documents were spreadsheets and management summaries from these spreadsheets, as produced by the project manager. In producing the management summaries of the spreadsheets, the project manager had to interpret the measures, and this interpretation was the subject of meetings of the research project team, and documented by myself as meeting notes. These meeting notes were supplemented by notes taken during informal discussions with the project manager and the transcripts of formal interviews.

During the evaluation stage of each iteration, the data prepared by the project manager was analysed by the research team through a process that involved identifying the additional or modified tasks undertaken by the XYZ Project team as a result of having the measures available. An impact analysis of these changes on the project timeframe and budget provided a qualitative assessment of the value of each of the measures. This impact analysis was then used as one input to the planning phase of the next iteration of the research project.

A specific task that was identified during the planning phase was the need to ascertain the education and expertise of the current staff of the project office, and the perceived maturity of the existing project management approaches. This was undertaken by way of a survey, summarised using basic statistical techniques and text aggregation.

**Data Collection and Analysis for the Research Goal**

The outcome required for this goal was a theoretical model for the methodology-for-use, using the preliminary methodology as a starting point. There were two aspects to this. Firstly, there was a need to more fully understand what ‘project management’ involved, in order to develop a concept of project management within the evolving theory. Secondly, there was the need to discover and understand issues that arose from the XYZ Project that could act as “hooks” for exploring alternative theories. The first of these aspects to data collection for the research goal was achieved through the development of a model of project management using Soft Systems Methodology (Checkland and Holwell 1998), and using this model to understand ‘project management’. The second aspect was achieved through the data collected for the organizational goal: by textual analysis of documents, meeting notes and interview transcripts to identify issues arising from the XYZ Project.
These two items of data were used in the theory development phase of each iteration in the form of questions that a theory needed to be able to answer. These questions were then approached from the collaboration/social-mediation philosophical viewpoint and the ideas inherent in the participatory approach to systems development that were described in Chapter 2 of this dissertation. Taken together, these three elements provided the intellectual scaffolding for developing the theoretical model of IS project management.

3.5 Part 2: Meta-Study

This part of the research study described in this dissertation is concerned with theory validation. The theoretical model that was developed during the action research part of the research was assessed for its ability to explain reported IS project success and failure. The base data for this research was a set of ten reports prepared by the audit departments of various governments. Each report was originally commissioned to provide an analysis to government of the status and future of the project in light of reported problems. The research task is to analyse these reports to uncover the various common themes related to problems that were reported, and then to provide an explanation as to how these themes could have been addressed by the theoretical model.

The research task therefore involves three distinct steps: the analysis of the reports, the identification of the common themes, and the discussion of the themes in terms of the theoretical model. This section discusses the use of hermeneutics as the main mode of analysis, meta-study as the research approach that integrates the three steps of the research task, and how these were applied to this piece of research.

As discussed in the previous section of this chapter, hermeneutics provides the analytical base for examining the texts. Hermeneutics as a research method is concerned with establishing the context and meaning of a text; researchers using this method are concerned with developing an interpretation of the data (that is, the texts) based on a particular point of view (either the researcher’s or the people being reported on) (Patton 1990). Researchers with different backgrounds and research purposes may develop different interpretations. This interpretation is characterized by the hermeneutical circle, whereby the gaining of understanding occurs through a continual movement between the whole and the parts of the text, refining meaning and resolving contradictions on
each move (Myers 1997). In this phase of the research described in this dissertation, it is this application of the hermeneutical circle that is the key feature of the application of the mode of analysis. In terms of the three steps involved in the research, the hermeneutical circle informs both the analysis of the texts and the identification of the common themes. These two steps, together with the relating of the themes to the theoretical model, occur within the overall research approach of meta-study.

A meta-study is a study of other studies, and is similar to research reviews, but differs from research reviews in two ways. Firstly, research reviews are generally project-oriented (a preparatory step for further research) whereas a meta-study is discipline focused (the aim is to advance the discipline); secondly, meta-study is explicitly reflexive, seeking to discover new explanations (Zhao 1991). Meta-study begins with analysis (the examination of the theory, method, data, results and conclusions in the primary reports), and ends in synthesis (using the analysis to generate new insights) (Paterson, Thorne, Canam et al. 2001, p5-6). As a research approach, meta-study assumes that no single, objective explanation will be found, that the understandings constructed arise from the text which is itself an interpretation by the authors of the text, and that the texts are themselves influenced by the social, cultural and ideological context in which they were prepared (Paterson, Thorne, Canam et al. 2001, p7).

Meta-study is a comparatively recent name used as an overarching term for a collection of previously separate research techniques (Zhao 1991). Sociology has long been concerned with a systematic treatment of the underpinnings of sociological research, using the terms meta-sociology and meta-theorizing to refer to this mode of theorizing about sociology (Ritzer 1991). In anthropology, meta-ethnography represents an attempt to bring together the discipline’s body of research (Noblit and Hare 1988). Statistical meta-analysis (the combining of the results of individual studies to generate new insights) has been used in a variety of disciplines, including the social sciences (Rosenthal 1984, Glass, McGaw and Smith 1981), psychology (Hunter, Schmidt and Jackson 1982) and environmental economics (Matarazzo and Nijkamp 1997). As a qualitative research approach, the health sciences have used meta-analysis (Morse 1997), and more comprehensive meta-studies (Paterson, Thorne, Crawford et al. 1999, Paterson, Thorne and Dewis 1998) in its research.
The use of meta-analysis as a research approach in IS is rare (Hwang 1996), and these have involved the quantitative (statistical) version of meta-analysis (for example, Chau 1999). Examples of qualitative meta-studies in IS proved elusive. Whether this is due to unfamiliarity with the approach or some fundamental problem with applying it to IS research is a matter for debate; it has however been used as a research approach in management and organizational studies (Hwang 1996, p36) and is therefore likely to be applicable to IS research. It is therefore apparent that the use of meta-study as a research approach for the research described in this dissertation represents a possibly novel application.

Meta-study as a research method involves a number of inter-related steps (Paterson, Thorne, Canam et al. 2001). Meta-data-analysis involves categorizing the data (usually primary research reports), meta-method examines the influence of the particular, individual research methodologies, meta-theory identifies the major paradigms that informed the individual pieces of research, and meta-synthesis critically examines existing explanations to resolve paradoxes and contradictions that the previous steps uncovered (Paterson, Thorne, Canam et al. 2001, pp11-12). In the research described in this dissertation, the focus is on meta-data-analysis, meta-theory, and meta-synthesis, realised through the application of the principle of the hermeneutical circle. Explicit application of meta-method is not considered relevant to this research, as the texts used were prepared by bodies adhering to generally accepted standards, (the prescriptions of the auditing profession), and therefore have employed similar methodologies and analytic frameworks in preparing their reports.

As used in this research, each step was defined as follows. Meta-data-analysis involved the coding of each report in order to uncover the major issues identified by the authors of the reports, resulting in a set of classifications and exemplars of each classification drawn from the reports (Lacity and Janson 1994). Meta-theory was used in the sense of discerning the common themes in this initial coding: what were the underlying situations that gave rise to the identified problems? That is, what were the frameworks being used by the authors to identify the problems? This step involved the critical examination of the initial classification scheme, re-reference to the reports, and the definition of a new (parallel) set of classifications of the base codes: the application of
the hermeneutical circle. Finally, meta-synthesis was used in the context of examining this new classification structure in terms of the theoretical model.

The source data is a set of texts describing success and failure characteristics of IS projects from the point of view of independent reviewers (government audit departments). Text fragments from each report were identified and coded according to the classical success and failure factors discussed in Chapter 2 of this dissertation, with frequent re-examination of completed coding necessary to ensure consistency of coding (Newman 1989). The next step was to uncover common themes in this collection: it is in this step that the principle of the hermeneutical circle applies, as there is a continuous movement between the individual text fragments and their individual contexts, and the set of themes that emerges from the whole. Although formalised after the coding step, the themes emerged primarily in parallel with the coding step, when it became clearer that the initial classification scheme was not capturing the essence of the texts: the intended message of the authors (Lacity and Janson 1994). The end result is a set of themes that are grounded in the individual texts, arrived at through a process of continual refinement: the hermeneutical circle.

As a preliminary step to meta-data-analysis, Paterson, Thorne, Canam et al. (2001, p11) identify five processes for the selection of the primary texts: identifying the inclusion/exclusion criteria, specifying the sources of the data, how the texts will be treated, how the data will be retrieved, and how the documents will be maintained. Given the purpose of this research (theory validation) and the constraints imposed by the dissertation process, I chose to limit the texts used to publicly available material that adopted a common reporting technique and methodology. To this end, I retrieved ten audit reports available on the Internet prepared by government audit bodies in the United States, Australia and the United Kingdom. These countries have similar audit standards, so the reports are similar as to their reporting and methodology. All of the reports are concerned with significant systems (in terms of time and cost), and so are likely to face similar issues in their conduct. The texts were printed in preparation for coding; the small number did not present a document management problem. Full details of the texts, including a brief synopsis of each, are contained in Chapter 6.
In the meta-data-analysis step, text fragments that related to issues with the project were identified in each text, and coded (possibly multiply) against the classification scheme, using the NVivo software package. This classification scheme was expanded as the coding progressed to cater for additional categories. Occasionally reclassification was necessary as the meaning of each category was refined. Details of the classification scheme and examples of text fragments are presented in Chapter 6.

The meta-theory step proved to be the most challenging step, as it required repeated evaluation and re-evaluation of emerging alternative classification schemes (that is, alternative sets of themes). As explained earlier, tentative alternative classification schemes began to emerge during the primary coding step, however, the refinement of the final scheme was a distinct step. The themes are discussed in detail in Chapter 6.

The final step was meta-synthesis. This involved comparing the themes that emerged during the meta-theory step with the theoretical model. The goal was to relate each of the themes to the theoretical model, and explore how the model would have highlighted or mitigated the issues faced by the projects. In some cases, the theoretical model that was developed during the action research part of the research provided clear guidance; in other cases, additions to the model were necessary.

The outcome of this phase of the research described in this dissertation was an augmented theoretical model, informed by the use of meta-study as the research approach.

### 3.6 The Three Rs: Relevance, Rigor and Reliability

This section is concerned with the quality of the research, as reflected in its relevance (how practitioners can use it), rigor (the extent to which it follows accepted research practices), and reliability (how dependable are the outcomes). The debate over whether IS research can be both rigorous and relevant to practitioners has received considerable attention in recent years. In the journal *MIS Quarterly* (Lee 1999) and in a special volume of the *Communications of the AIS* (Gray 2001), as well as in other publications, a number of authors have explored this topic in detail. This debate is worthwhile for a number of reasons. Firstly, it serves as a forum for a multitude of opinions to be
presented and debated, thereby bringing these issues to the notice of the IS community. Secondly, it sets the scene for variety in the academic journals, thereby providing a reference point for those interested in the engaging in research that supports practice. The point that those who have engaged in this debate make is that it is not a matter of either/or, but a balance between both.

In order to be relevant to practitioners, it has been observed that articles should provide implementable suggestions, or bring together and synthesize a body of knowledge, or act as a stimulus to further inquiry into a particular area (Benbasat and Zmud 1999). In the context of the research described in this dissertation, the primary aim is to satisfy the first criterion: to provide practitioners with a theoretically sound IS project management methodology that can be adapted and used in their particular situations. In this sense, this research is clearly concerned with relevance. However, this primary aim also carries with it the need for rigor, for without rigor in the research, the ultimate value to practitioners may be compromised.

In providing their critique of relevance in academic writing, Benbasat and Zmud (1999) make nine recommendations that they believe researchers should address in their work in order to satisfy the relevance criterion of their research. This framework can be used to assess the research described in this dissertation, and this assessment is presented in Table 3.1.

In an article in the same edition as the Benbasat and Zmud article, Davenport and Markus (1999) respond to the points made by Benbasat and Zmud, and suggest further (some alternate) criteria for relevance in IS research. They state the case that IS researchers should undertake "excellent practical research that differs from excellent traditional academic research" (Davenport and Markus 1999 p20). I consider the research described in this dissertation to be more towards the former, in that the goal is to produce guidelines for practitioners, yet it also contains significant elements of the latter, in that there is close attention to detail in selecting and using appropriate research methods in order to build theory.
<table>
<thead>
<tr>
<th>Relevance Criterion</th>
<th>Application to the research undertaken</th>
</tr>
</thead>
<tbody>
<tr>
<td>The foremost criterion to be applied in selecting research topics should be directly related to the future interest that key stakeholders (journals, colleagues, and practitioners) are likely to hold in a topic.</td>
<td>The management of IS projects continues to be a major concern of practitioners. Despite the solidification of project management research in general, IS project management research remains an area that requires more work to be done on bringing together findings from referent disciplines and translating these for practical use.</td>
</tr>
<tr>
<td>IS researchers should look to practice to identify research topics and look to the IS literature only after a commitment has been made to a specific topic.</td>
<td>This research has its origins in the professional experience of the author and an in-depth knowledge of IS project practices.</td>
</tr>
<tr>
<td>Members of the IS research community must prepare manuscripts that define the important phenomena for the various segments of the IS discipline, in order to influence practice. (Paraphrased)</td>
<td>This research looks to draw upon several major themes in IS, especially IS development and people issues, in order to provide a sound basis for the research.</td>
</tr>
<tr>
<td>When deciding whether or not to begin a new research project or a new manuscript, IS researchers should focus on the likely outcomes, rather than inputs, of such efforts.</td>
<td>In the explanation provided by the authors, it is made clear that this is concerned with ensuring that the project has relevant outcomes as its objective, not to act as a showcase for a particular research method, and that this imperative does not imply that the research method and subsequent analysis is not important. The research presented in this dissertation has clear outcomes: a practical IS project management methodology.</td>
</tr>
<tr>
<td>In order for IS researchers to be more proactive in a direct sense, it is imperative that the IS research community produce cumulative, theory-based, context-rich bodies of research.</td>
<td>By reframing the problem of IS project management, this research seeks to use ideas, theories and results from the IS discipline and some reference disciplines in order to develop a useful model of IS project management that can be applied in practice.</td>
</tr>
<tr>
<td>In order for IS research to be more relevant, it is important that authors develop frames of reference which are intuitively meaningful to practitioners to organize complex phenomena and to provide contingency approaches to action.</td>
<td>This is a call for theory to be expressed in ways that enable practitioners to relate theory to practice in the context of their experience and their own organizations. This research seeks to achieve this by incorporating terminology and examples from real projects.</td>
</tr>
<tr>
<td>In order for IS research to be more relevant, IS academics should portray the outputs of their research in ways such that it might be utilized by practitioners to justify and rationalize IT-related initiatives.</td>
<td>This research has sought to be inclusive of the multitude of views that exist within organizations relating to IT usage, and in particular address the issues that confront this variety of constituents. In this way, the people who are involved with IT can relate the ideas to their areas of responsibility.</td>
</tr>
<tr>
<td></td>
<td>The vast majority of IS research articles should be crafted in a clear, simple, and concise manner such that they are accessible by all the potential readership of a journal.</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>9</td>
<td>IS journals should publish a balance between rigorous and relevant articles, or, ideally, articles that are characterised by both. (Paraphrased)</td>
</tr>
</tbody>
</table>

**Table 3.1: Responding to the Nine Recommendations of Benbasat and Zmud**

*Source: Based on Benbasat and Zmud (1999, pp8-12)*

In counterpoint to Benbasat and Zmud (1999), Lyytinen (1999) discusses a number of issues that are relevant to the current research. The first of these is the need for IS research to not only be accessible (in the form of prescriptions for practice), but also act as a source of behavioral change in the longer term. This is a particularly relevant comment for the research described in this dissertation, as it is hoped that by providing a sound theoretical basis for IS project management methodologies, a coherent set of methodologies will be available to practitioners in the longer term, irrespective of the changes to the nature of the projects themselves. The other valuable point made by Lyytinen is that much IS research follows practice by investigating practice rather than leading practice through theory-based research leading to practical prescriptions for practitioners. The aim of the current research is directly aimed at this criticism by developing a theoretical model that arises from research-in-practice and translating this into a testable model and guidelines for practice. This approach also is in concert with the criticism of Benbasat and Zmud's work by Lee (1999) that seeking to explain current practice rarely leads to significant advances in knowledge. This is the distinction between research conducted in the spirit of the natural sciences (explanatory) and research conducted in the spirit of the professions: "the goal of effectiveness in actions" (Lee 1999 p 31).

Based on the analysis presented in Table 3.1, I consider the research described in this dissertation to adhere to the nine criteria proposed by Benbasat and Zmud (1999), and to the additional criteria proposed by Davenport and Markus (1999) and Lyytinen (1999)
to the extent that the research can be considered relevant, thus satisfying the first requirement (relevance).

The specific issue of the rigor of post-positivist research in IS is important in the larger context of having the findings accepted, and therefore made available to a wide audience. One approach is to argue the case in every writing involving a post-positivist research approach; an alternative is to grow the body of literature on research approaches and concurrently develop standards that, if embraced, can be used to claim rigor for the particular research in question. Examples of recommended research practices aimed at ensuring rigor include models for case study research (Darke, Shanks and Broadbent 1998) and for the use of action research (Kock, McQueen and Scott 1997). As a proposed set of guidelines for assessing whether or not IS post-positivist (specifically interpretive field study) research can be considered to be rigorous, Klein and Myers (1999) identify seven principles that, if followed, imply rigor. This framework can be used to assess the research described in this dissertation, and this assessment is presented in Table 3.2.

Based on the analysis presented in Table 3.2, I consider the research described in this dissertation to adhere to the seven principles proposed by Klein and Myers (1999) to the extent that the research can be considered rigorous, thus satisfying the second requirement (rigor).

Reliability in the narrowest sense is concerned with how dependable the data is (Lincoln and Guba 1985), but in a broader sense, it is how credible the outcomes of the research are (also termed external validity, a term more suitable to positivistic research) (Patton 1990). In the research described in this dissertation, the reliability of the outcomes is addressed in two ways: through the rigorous application of the research approaches and by the adoption of two independent studies (triangulation). The first requirement for reliability has been discussed earlier in this section; the use of triangulation is discussed below.
<table>
<thead>
<tr>
<th>Principle</th>
<th>Description</th>
<th>Application to the research described in this dissertation</th>
</tr>
</thead>
<tbody>
<tr>
<td>The hermeneutical circle</td>
<td>Human understanding is achieved by iterating between considering the interdependent meaning of the parts and the whole.</td>
<td>Explicitly used in the meta-study; implied in the action research as specific outcomes in practice are used to refine theory and initiate another cycle of the action research.</td>
</tr>
<tr>
<td>Contextualization</td>
<td>Critical reflection of the social and historical background of the research setting.</td>
<td>The host organization revealed their agenda (to change their particular practice) as I did (to have an explicitly people-centred theory); the research was conducted with these shared understandings.</td>
</tr>
<tr>
<td>Interaction between researchers and subjects</td>
<td>Critical reflection on how the research materials were socially constructed</td>
<td>Some of the data for the action research was operational data, some was purposefully collected for the research; the interpretation of each occurred in the context of its source and purpose.</td>
</tr>
<tr>
<td>Abstraction and generalization</td>
<td>Relating the details revealed by the data interpretation to theoretical, general concepts that describe the nature of human understanding and social action.</td>
<td>The use of action research provided the opportunity to develop theory based in practice, but applicable to other situations, as only the methodology-for-use derived from the theory was tailored to the research setting.</td>
</tr>
<tr>
<td>Dialogical reasoning</td>
<td>Sensitivity to possible contradictions between initial positions and the need for revision</td>
<td>The action research resulted in the development of a theoretical model, and this was subsequently augmented as a result of the meta-study; the overall goal was theory development, not confirming existing theory.</td>
</tr>
<tr>
<td>Multiple interpretations</td>
<td>Sensitivity to the possibility of different interpretations of the same event</td>
<td>The research setting enabled the different viewpoints of the project team to be openly discussed.</td>
</tr>
<tr>
<td>Suspicion</td>
<td>Sensitivity to the possibility to bias and distortion in the narratives provided by the participants</td>
<td>The organizational setting and the use of some of the data for operational purposes required that the integrity of the data be assessed continually.</td>
</tr>
</tbody>
</table>

Table 3.2: Applying the Seven Principles of Qualitative IS Research

Source: Based on Klein and Myers (1999, p72)
Triangulation is a term that refers to the use of multiple and different sources of data, methods, investigators and theories (Denzin 1978). In the context of the research described in this dissertation, it more narrowly refers to the use of two research methods, or the adoption of multi-methodology (Mingers 1997, 2001a). In terms of the taxonomy of multi-methodology proposed by Mingers (1997, p7), this research is a variation of the ‘methodology combination’ approach: one paradigm, same intervention, full use of each method. This technique increases the likelihood of producing credible research outcomes (Lincoln and Guba 1985).

By adherence to established research approaches, the careful use of these approaches, and an overall research design that uses two independent research methods, I believe that the three imperatives of relevance, rigor and reliability for IS research have been satisfied in the research described in this dissertation.

### 3.7 Ethical Considerations

Ensuring that this research was carried in an ethical manner was addressed at two levels: as part of the research design, and as part of practice. During the design of the research, a number of issues relating to ethics were identified, including the need to inform participants of the purpose of the research (to obtain informed consent), the requirement of confidentiality (especially as it relates to comments made by team members), and the right of the participants to decline to participate in surveys. These issues were documented and addressed, and approval to proceed subsequently obtained from the University’s Research Ethics Committee.

At the practical level (during the primary research in ABC Insurance), ensuring that the research was conducted according to the approved guidelines was one of the roles of the oversight committee. One of the functions of this committee was to consider and approve any new (in the sense of innovative) actions by the project manager. In this way, sensitive and potentially harmful actions can be closely examined. The participants (staff of the host organization) were informed of my presence, and the purpose of the research. Invitations to discuss any issues relating to the research were made by the program manager. When written responses to questions were required of staff, they were informed that participation in the research was voluntary.
For the meta-study, the documents used are available in the public domain, and it was assumed that the original authors have obtained appropriate approvals, given that the reports were prepared by government auditors. In any event, individuals were not identified in the original reports, so it was not possible to identify individuals in analyses.

### 3.8 Conclusion

This chapter has described and justified the research approaches adopted in this research. These research approaches provided the framework within which the research questions that evolved during Chapter 2 were addressed. Two categories of research questions became apparent: a category of three questions that are concerned with the development of theory grounded in practice, and a category containing one research question that is concerned with theory evaluation. Through a critical analysis of available research approaches, action research emerged as the most appropriate research approach to address the first category. The second category, involving evaluating the theory that was developed during the action research, was addressed though a meta-study grounded in hermeneutics. Therefore, a rigorous research framework has been designed that satisfies the criteria of rigor, relevance and reliability in IS research.

The next chapter of this dissertation, Chapter 4, presents the results of the action research part of the research study described in this dissertation. The following chapter, Chapter 5, then describes in detail the theoretical model that evolved during the action research. Chapter 6 then presents the results of the meta-study used to evaluate the theoretical model.
Chapter 4: The Action Research Project

4.1 Introduction

The previous chapter of this dissertation explained the arguments behind and justified the use of action research and meta-study to address the research questions developed in Chapter 2. This chapter describes the first part of the research study of this dissertation: the action research project to develop a theoretical model of IS project management, the development of a methodology-in-use from this model, and the evaluation of this methodology-in-use, that is, the investigation of the following three research questions:

1. What is a possible theoretical model of IS project management that reflects (or is grounded in) a collaborative/social-intervention conceptualisation of IS and IS development?

2. What are the characteristics of an IS project management approach that is grounded in the theoretical model of IS project management?

2A. Does this IS project management approach increase the likelihood of project success?

The theoretical model developed is then described in Chapter 5, and the meta-study undertaken to validate the model described in Chapter 6. The following chapter, Chapter 7, discusses the results of both the action research project and the meta-study in relation to the discussion in Chapter 2.

Section 3.4 discussed in detail how the principles of action research were applied to this research: a series of iterations each involving five stages (situation diagnosis and theory framework evaluation, planning, application to practice, evaluation, and theory modification), all taking place within the chosen research environment. The activities, results and interpretations of the action research project are presented using this
framework: each of the three iterations is discussed as a separate section, and within each section, each of the five stages is used to sub-divide the material further.

Therefore, this chapter is organized into six major parts. The first of these describes the IS project that is the focus of the action research project in detail, and the second describes the overall research environment. Then follow three sections, one for each of the iterations that comprised the action research project. The last section provides an overall summary of the project.

*In this chapter, paragraphs that are in italics (like this one) discuss issues related to the emergence of the theoretical model, and provide the link between the work on the participant’s project and my work to develop the theory. These theory-related issues are used as the basis for the detailed exposition of the theoretical model in the next chapter.*

### 4.2 The Candidate IS Project

The IS project used for the action research project was a project established for the purpose of relocating a telephone call centre and its associated technical and human resources to another city. The project involved a wide variety of tasks, including facilities planning, technical infrastructure design and implementation, preparation of training material, recruitment and training of initial staff, and the establishment of ongoing operating procedures. The project involved IS-related elements such as human-computer interface design and training, and more general elements such as site ergonomics. These, together with high visibility from senior management, provided an opportunity to assess a wider application of the model that may be absent in the more usual IS development projects that focus on software development.

The host organization (*ABC Insurance*) was a large multi-national insurance company, providing both personal insurance and property insurance. In addition to providing insurance products under their own name, the company acted as the managers for a number of other insurance companies. As part of their customer service function, telephone call centres are used extensively. These call centres often provide the first point of contact of prospective customers, and the call centre operators answer general
queries and issue quotations for insurance. As part of policy administration, the call centre operators perform day-to-day housekeeping functions such as effecting changes of address and arranging premium payments. In the event of a claim, the call centre operators initiate the claim process and often act as the point of contact with claimants during the claims settlement period. The company therefore views its call centre operations as a vital part of its business, as its reputation to a significant extent rests on the professionalism of the call centre staff.

Each call centre represents a considerable financial investment to the company. The establishment of the physical infrastructure, the initial and ongoing training of the staff, and the maintenance of the environment require careful management if premiums are to be kept at competitive levels. The largest cost is related to staff, followed by rental on the facilities. Therefore, close attention is given to these aspects of the call centre operations, and is regularly reviewed by senior management.

The project selected for this research involved the moving of a call centre from one city to another. There were two main drivers for this move. Firstly, the state government where the call centre was to be located offered financial incentives to firms wishing to set up operations that involve employment opportunities, in the form of assistance with establishing the facility, and financial subsidies for the ongoing operations. Secondly, the cost of labour in the target city was lower than in the existing city, due mainly to the significant differences in the respective costs of living. This would translate to a lower wage bill for the company. An assessment of the relative merits of these political, economic and social aspects was carried out prior to the project described here being formally constituted, and the benefit-cost case established. Nevertheless, the project involved some risks (described later), and the assumptions underlying the benefit-cost analysis meant that the time frame for completion was important. (For example, the state government incentives required certain deadlines to be met.)

From an information systems perspective, the project contained some interesting features relevant to the research, especially in the diversity of the tasks involved and the range of stakeholders. The company operates several call centres, however the one in question was the largest. It is a feature of this type of operation that customers calling the published phone number are not aware of the physical location of the call centre,
and one of the requirements of management was that service to customers continued uninterrupted. There was thus a tension between operating both centres in order to ensure a smooth changeover and minimising the costs associated with having two centres in operation. Both company staff and contractors were involved in the project, providing the opportunity to address the issues involved with contractor supervision. The initial training of new staff was a key task for the project, as was the preparation of training material for later recruits. Planning of the technical infrastructure (including the modification of company-specific software) required access to a diverse group within the company, in addition to liaising with contractors. Finally, the closure of the existing call centre involved staff retrenchments, and this aspect required careful management, especially the personal issues this action raised with staff. Overall, the diversity of the project provided a good test of the proposed project management model.

Organizationally, the project was conducted as one of a number of projects managed by the Project Management Office (PMO), a group that is part of the general insurance administration, but with a focus on business-driven projects with a significant technology component. The PMO is separate from the IT development function, and from the business divisions. Each project undertaken by the PMO is assigned to a project manager, and each project manager may be running several projects simultaneously. In this case, the call centre relocation project was the sole responsibility of the project manager for the duration of the project.

The planned timeframe for the project was January to July 2002. Practical completion was achieved in August 2002, due to cumulative minor delays and an unrealised assumption relating to software modifications. I first became involved with ABC Insurances in late 2001, when I was negotiating to undertake the research, and had significant ongoing contact during the period September to November 2002, when I finalised the research with the company. Figure 4.1 illustrates the post fact timeline for the project, based on the key business milestones as identified in the project charter, and includes the approximate time span of the three iterations of the action research project.

In the remainder of this chapter, two terms will be used for the sake of clarity of exposition. References to the project are references to the tasks involved in the relocation of the call centre, that is, the project from the perspective of the company.
References to the research activities are references to the action research project. This is consistent with the key idea in action research that it is necessary to clearly differentiate the two parallel sets of tasks.

![Project Timeline Diagram]

**Figure 4.1: Project Timeline**

### 4.3 The Research Environment

As described in Chapter 3, one of the key activities in an action research project is to establish the research environment within which the research activities take place. This involves two key areas: the initial contact, including the establishment of the parameters of the project and research activities, and the ongoing arrangements for monitoring the project and research activities. This section describes these areas in order to more fully set the scene for the substantive results obtained during the research activities.

The introduction to the company was through a professional contact already employed by the company (although not part of the PMO). Emails were used to explain and clarify the background of the research and the researcher, and to establish that the
company was willing and able to be involved in the research. This exchange established early on that from the company’s perspective, a long-term benefit in the form of revised project management practices was the goal of the company, so that an important issue for the company was the transfer of knowledge. Then ensued a series of meetings between the manager of the administrative division, the manager of the PMO, two senior members of the PMO and myself. The role of these two senior members of the PMO was to prove crucial to the project and the research activities.

The first person was the technical system architect (hereafter referred to as the system architect) for the business systems, and as such had a broad vision for how information systems within the company should be developed and used. His background provided knowledge of many different development and project management methodologies, and so he provided an alternative view of the project management methodology that I was proposing. The second person was an experienced project manager (hereafter referred to as the project management consultant) with a particular brief to bring the project management documentation up-to-date. Therefore he had a vested interest in ensuring that the outcomes of the project were transferable to other projects within the company.

This group (the manager of the administrative division, the manager of the PMO, the system architect and the project management consultant and myself) became the research activity management group, that is, the group whose major concern was the application of the project management methodology and its eventual transfer to other projects within the company. The group met regularly during the project. The management of the project was carried out through existing procedures, mainly through a weekly meeting of project managers from the PMO and representatives from the business divisions. Project-specific meetings were held as required, and involved the project manager and the business division manager and such other people as required to address the issues under consideration. This was not a regular meeting.

Housekeeping issues such as accommodation, access to email and the company’s intranet and publication rights were agreed at this stage. In all, these negotiations and meetings occurred over a three-month period towards the end of 2001. At the last of the meetings in this stage, the call centre relocation project was chosen as the project to be used to trial the project management methodology. By then, the assigned project
manager had prepared the project brief and preliminary estimates (described in more
detail below). The project had an estimated duration of seven months, and was to

The following sections describe the conduct of the project and research activities in
detail. In terms of the model for action research described in Chapter 3, there are three
identifiable iterations, corresponding approximately to project initiation, project
execution, and project finalisation. The five stages within each iteration are also
identifiable, although in practice stages overlapped, due to the dynamic nature of the
discussions that took place. For example, in discussing the lessons learnt from one
iteration, tentative plans for using this knowledge in the next iteration were considered.

4.4 The First Iteration – Project Initiation

Introduction

This section describes the first of the three identifiable iterations that occurred during
the project (see Figure 4.1). This iteration was essentially the establishment of the
project, and from the perspective of this research, involved the understanding and
application of the project management methodology that was to be the starting point for
the research.

Situation Diagnosis and Theory Framework Evaluation

Activities. Once the project was selected, the first task was to share knowledge among
the members of the project team, the system architect, the project management
consultant and myself (collectively the project planning group) in order to understand
the project and the environment. Two main items of knowledge were involved in this
exchange: knowledge of the project itself (in terms of aims, time scales, stakeholders),
and knowledge of the project management methodology that was being trialed.
Meetings and informal discussions were the methods used to achieve this sharing:

First working session on [the project]. First part covered the theory and process to
be used. General reaction positive, especially from ... [the project manager], ... [the
system architect] and ... [the project management consultant]. ... [the manager of
the PMO] seemed to be concerned with the amount of detail, but ... seemed to
appreciate the breadth of tasks that the methodology covered. ... The approach
From this particular meeting it became apparent that the focus of the project manager would be on the substantive outcomes of applying the methodology as they related to his project, while the technical specialists were primarily concerned with its congruence with existing practices; the PMO manager focused on schedule almost to the exclusion of other issues.

This was the first of several intensive sessions to apply the project management methodology to the project at hand. Appendix A contains a detailed description of this methodology: how to progress from project objectives to a set of operational measures to be used by the project management. The project objectives were obtained from the Project Charter, which framed objectives around the four conventional perspectives of the Balanced Scorecard, and divided into project objectives (for the project team) and business objectives (for the business stakeholders), and are shown in Figure 4.1. An examination of this figure from the point of view of the project team (middle column) reveals ten objectives, all focused on the deliverables for the project. With the exception of the first objective (“Move the existing … service centres to [City B]”), none of these objectives were quantified, thereby not making them directly translatable to measures. On the other hand, the objectives for the business stakeholders are framed around operational measures, especially the key performance indicators used to benchmark against similar centres.

In summary, the first task was to recast the objectives using the seven meta-perspectives of the Generalised Scorecard Model (GSM), expressing them as goals, and then add additional goals derived from the definitions of the seven meta-perspectives. The second task is to identify one or more questions for each goal in order to clarify what is meant by the goal, and the third task is to identify one or more measures that will answer each question.

This was a structured process, working from aims of the project (objectives) that were discussed by the group to understand the intent, to writing a number of “goal statements”, followed by questions and appropriate measures. This process was slow in the beginning, when attention was on the process, but once the process became familiar,
the task progressed faster, with focus on the content of the work. An example of this process is given by the discussion that ensued concerning staff in the call centres:

Goal: To improve the efficiency of the call centre process.

Q: How do we make the most of facilities?
> Facilities Management Plan

Q: How do we ensure that we are using appropriate technology?
> Facilities Upgrade Plan

Q: How do we know we are improving?
> Set of benchmarks

Working notes, 22 January 2002

Although the measures identified in the example above require further work to enable them to be used by the project manager, the crucial work of translating objectives to measurable outcomes had been achieved. After this meeting, I produced an example for future meetings, which illustrated an “ideal” result from the process:

The project objective from the Customer perspective

Sufficient training for all staff

Is captured in the general goal

Training

The question that is being asked is

Are the staff adequately trained?

Which can be answered by the measures
Completeness of the training plan: the extent to which the plan for training is up-to-date and accurate
Completeness of the training material: the extent to which the plan for the production of the training material is being followed
Completeness of training of the initial staff: the extent to which the plan for the training of the first group of staff has been followed
The output of these sessions was a set of measures for the project, as detailed in Appendix B, with an extract shown in Figure 4.2. The first column identifies the GSM meta-perspective (in this case the *Stakeholder* meta-perspective), and this was used to assist in framing the goals (column 3), based on the description of this meta-perspective (see Appendix A). The questions and measures (metrics) were then derived using the goal-question-metric framework as described in the overview of the methodology in Appendix A. Once all of the goals were expanded, they were grouped into project perspectives, as shown in the full list in Appendix B. This grouping permitted easier reference when discussing the various measures.

<table>
<thead>
<tr>
<th>Corporate Objectives</th>
<th>Project Objectives</th>
<th>Business Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Functionality Deliverables (Responsibility of the Project Team)</td>
<td>Benefits (Responsibility of business stakeholders)</td>
</tr>
<tr>
<td>Financial Total Cost Management</td>
<td>Move the existing service centres to</td>
<td>Reduce the yearly operating cost for the PI Broker and Corporate Partner service teams by 20%</td>
</tr>
<tr>
<td>Customer satisfaction</td>
<td>Documented customer service levels</td>
<td>Customer satisfaction surveys achieve 90%</td>
</tr>
<tr>
<td></td>
<td>Maintenance of acceptable service levels during the transition</td>
<td>All KPIs being met from day-one and ongoing</td>
</tr>
<tr>
<td></td>
<td>Sufficient training for all new staff</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A successful Service Centre pilot will be undertaken as a prerequisite for operational signoff</td>
<td></td>
</tr>
<tr>
<td>Process</td>
<td>Call handling review</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Review the client call handling process in light of the capabilities of the Solidus telephony system</td>
<td>Improvements in the ability to administer and handle client calls resulting in an improved ability for Service Centre staff to meet KPIs</td>
</tr>
<tr>
<td></td>
<td>Implement process improvements provided by the Solidus telephony system</td>
<td></td>
</tr>
<tr>
<td>People</td>
<td>Outstanding customer service and customer relations</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hiring of staff with excellent customer service experience</td>
<td>Staff and stakeholder satisfaction survey shows positive response to the PI Service Centre</td>
</tr>
<tr>
<td></td>
<td>Where staff are new to the company training is to provide full coverage of the company and its culture, the PI Broker and Corporate Partner products and service requirements, and the supporting IT systems</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mentoring of new staff by selected members of the existing service centre during the transition</td>
<td></td>
</tr>
</tbody>
</table>

**Figure 4.2: The Project Objectives**

*(From the Project Charter Version 1.2)*
Reflection. During a meeting to further refine the measures, two issues were discussed by the research activity management group in relation to the project. Firstly, the standard within the organisation at large is to use the Balanced Scorecard as a corporate goal-setting framework, and therefore it was seen as desirable to link the project objectives with these objectives. Secondly, a number of the metrics were seen as being relevant beyond the end of the project: they could be used to gauge the ongoing success of the project.

![Table](From Metrics Spreadsheet Version 1)

**Figure 4.3: Some Measures Identified During Planning**

*From Metrics Spreadsheet Version 1*

The first issue, linking the corporate objectives with the project objectives would appear to be addressed by mapping these frameworks through the meta-perspectives, as both the project objectives and the Balanced Scorecard can be related to a common set of meta-perspectives according to the principles of the GSM. Under this scenario, it is a straightforward matter to take the Balanced Scorecard objective and “re-assign” it to a GSM perspective, and then use the principles of the methodology (Appendix A) to define a new perspective. However, what the GSM provides in addition to just permitting a new set of perspectives is a much richer set of questions to be asked around each meta-perspective, leading to a more comprehensive set of objectives.

This way of mapping objectives highlights the flexibility of using the Generalised Scorecard Model meta-perspectives as the source of project perspectives, rather than persisting with the existing (Balanced Scorecard) perspectives, and is illustrated by the move from the Learning and Growth perspective of the Balanced Scorecard (labelled
People internally) to the Recipient perspective of the project. The corporate objectives focus on objectives seen as important from a strategic management point of view (consistent with the origins of the Balanced Scorecard). However, from the point of view of the project, training staff to fulfil customer expectations (or, rather, creating the training material) is a task of the project team, and is captured in general in the project planning objective and specifically in the training objective. Note that the People perspective from the project point of view is concerned with the people in the project team. Conceptually, this discontinuity at the meta-perspective level represents a shift in perception of the definitions of the meta-perspectives, and reinforces the need to be careful in how each of the meta-perspectives are used, especially in different applications of the methodology. It is appealing to be able to directly map objectives from one point of view to another through a common meta-perspective. However, this ignores the semantics of the point of view, that is, the meaning given to the meta-perspective in light of the particular application.

In order to satisfy the aim of being able to trace the corporate objectives as expressed in the Balanced Scorecard framework to the project objectives, the development of the project objectives from the corporate objectives was traced during the derivation of the measures. The initial guidelines used by the project team were based on the description of the seven meta-perspectives, and were in the form of sets of questions relating to objectives and how these are translated to measures. In the context of the present discussion, the corporate objectives as expressed by the Balanced Scorecard can be considered as objectives of the “strategic managers” (a stakeholder in the project). In this project, this consideration of the corporate objectives was not a conscious operation. Rather, the corporate objectives were used as triggers to aid in developing the project objectives.

This discussion on the mapping of the objectives was the first indication of the effect of having a narrow scope for the “project”: the business stakeholders were seen as outside of the project team’s responsibilities, yet the objectives of both groups are intimately related. Beyond the initial planning exercise, there was no evidence that these two sets of objectives were being seen as closely related, or that efforts were made to ensure that each group was aware of the other’s objectives. In terms of theory development, this highlights the need for some framework that will enable a consistent
set of objectives to be identified for the project. It also raises the question as to why there are two sets of objectives, beyond administrative convenience, in light of the close relationship between the two sets.

The second issue that caused much discussion was related to the time span covered by the measures. The focus of the measures defined for this project is the successful completion of the project by a specified time. However, many projects have an implicit goal of organisational change, and this change is assumed to last (that is, become the norm) after the project has been brought to a formal conclusion. Therefore, the issue involves determining if ongoing monitoring (in terms of measures) is warranted, and if so, what these measures should be.

The first aspect of this issue (ongoing monitoring) requires another change in the point of view applied to the meta-perspectives. The focus so far has been on the project, and this focus has resulted in a set of objectives and measures specifically for the project, and in particular aimed at successful completion of the project by a specified time. While a detailed analysis of the application of the Generalised Scorecard Model to conventional management tasks is outside the scope of this dissertation, a brief discussion is warranted in light of the questions raised during the research. One of the major differences between projects and day-to-day management tasks is the time issue. From the project point-of-view, time is a critical issue. This is not necessarily the case in the conventional management arena: there is some sense of continuity of the organisation. What is required is to identify objectives related to the time beyond the nominal end of the project. If this is done, then the derivation of appropriate measures can be done in the same way as the project measures.

The key question is whether these measures will be similar to the measures for the project that caused the initial organisational change. An examination of the objectives and resultant measures for this project suggested that some are. For example, the objectives relating to training and use of the call centre tools relate as much to ongoing operations as to the initial project. Within this project, the measures as defined were used for the purposes of the project (that is, to aid successful completion of the project), and not for ongoing monitoring. This issue will be reconsidered in the final chapter of this dissertation.
Constraining the analysis of objectives to the time frame of the project while there exist valid objectives outside this timeframe suggests that the definition of the scope of the methodology (and by implication the theoretical model underlying it) is wider than the project. In beginning the conceptualisation of the theoretical model, the thought comes to mind that possibly the timeframe for any IS project management theory is the entire life of the change. While the project in this research has a date by which the substantive actions need to be complete, the effect of the change continues, and from a long-term viewpoint, the project may “fail” if the benefits foreshadowed in the project charter are not realised in the long-term.

Planning

Activities. Applying the methodology resulted in thirty-eight measures being identified (Appendix C). An extract is shown in Figure 4.4. For each of the measures identified, a specific data source was identified, typically an existing report from one of the project teams. Each measure was then assigned a tentative frequency of measurement, with some measures nominated to be measured a finite number of times during the project, denoted by 1, 2, 3, … in the frequency column. This work provided the information required by the project manager to use the measures in the project.

After discussion by the project planning group, it was decided that only a sub-set of these would be actively monitored; the remainder would be used informally as a checklist. [The measures actually used are detailed in the next section of this chapter, and the issue of needing to identify a sub-set is discussed in detail in Chapter 6.] Collection of data for the sub-set of measures identified required minor modifications to the project plan that was managed by the project manager. Many of the measures were already used as part of the reporting process in place for other projects, so little extra effort was anticipated to collect the raw data. The project manager then prepared a spreadsheet for collecting and analysing the measures.

In the process of updating the project plan, the project manager realised that the methodology had unexpectedly identified additional deliverables for the project, thereby contributing to a decrease in the risk associated with the project. As the project manager explained:
... the process has highlighted things (deliverables) that have been overlooked (for example the telephony plan) ... monitoring metrics gives a higher level of "certainty" or "probability" that the project will be delivered according to time/cost/scope. This increase in certainty is [partly] due to ... deliverables that otherwise would not have been recognised until someway down the track being identified earlier. The 'goal' focus is a good complement to the 'task' focus, and helps completeness. (Interview, 11 February 2002)

The application of the methodology thus had two effects: the addition of tasks to collect the source data for the measures, and the identification of additional deliverables (and therefore the tasks required to produce them).

<table>
<thead>
<tr>
<th>To at least minmum existing levels of end-user satisfaction during transition</th>
<th>KPI Analyse</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have appropriate KPIs been established?</td>
<td>Goals/End state defined in SLA Targets/Plans</td>
</tr>
<tr>
<td>Quality of performance against SLA Targets/Plans</td>
<td>Strategic Focus</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Delivery/Assembly Environment</th>
<th>The CIO was supportive of end-state focused: architectural ergonomic quality profile.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Training</td>
<td>Are the staff adequately trained?</td>
</tr>
<tr>
<td>Completeness of training plan</td>
<td>Quality of training materials</td>
</tr>
<tr>
<td>Completeness of testing of IT and of end state</td>
<td>Strategic focus</td>
</tr>
</tbody>
</table>

Figure 4.4: A Sample From The Full Set of Measures

(From Metrics Spreadsheet Version 3)

**Reflection.** The identification of additional deliverables as a result of applying the project management methodology was attributed by the project planning group to the change of focus from *tasks* to *goals* (as articulated by the project manager). The preliminary planning that had been carried out was a conventional task focused activity: essentially a task breakdown exercise centred on the perceived tasks that constituted the project: site planning, equipment installation, conduct of training, recruitment. The aim was to complete these tasks: the focus was on the process. In contrast, the project management methodology has an inherent focus on goals, that is, what is the desired end state of the project: the outcomes. This focus on outcomes was considered to be complementary to the focus on process. The aim is to move the project forward to a successful conclusion, so having several crosschecks available was seen as a benefit to the project management process.
This change from tasks to goals provided an opportunity to critically assess the role of the “traditional” project management tools in the larger context of a project (or change to the organization). The original planning had been carried out using task lists derived from the project charter, and in particular the stated project objectives. That some tasks were missed lends some credence to the assertion that the objectives were incomplete. The conceptualisation of the theoretical model would need to provide some basis for ensuring that all of the deliverables (i.e., goals) were identified.

Application to Practice

Activities. In addition, the project manager reported that the “hard” evidence provided by the measures enabled definitive action to be initiated earlier than would have otherwise been the case. Overall, there was a feeling that risk was being managed better:

This increase in certainty is [partly] due to ... an early warning [being] given of possible issues – providing hard evidence, rather than having to rely on “gut feel”. Overall, the feeling is that risk has been managed better. (Interview, 11 February 2002)

This stemmed from a sense that looking at the objectives from many angles had covered the scope of the project better, and, together with timely information, the risk profile of the project was known and managed better.

Reflection. The value of the set of meta-perspectives as a starting point remains to be validated in practice as far as the degree of comprehensiveness is concerned. As the original source of the perspectives is in strategic planning, the extension to project management is not necessarily straightforward. However, there are sufficient similarities to suggest that the meta-perspectives are a good starting point. These similarities include a focus on business outcomes, the role of people and the (presumed) link of project objectives to corporate objectives. In a real sense, the project objectives are the next level of detail in the layering of objectives from strategic to tactical.

The focus on business outcomes of both strategic plans and project objectives suggest that there may be a degree of commonality in how the objectives may be realised. In the Balanced Scorecard formulation of perspectives, the essence of the approach is to identify a causal link from the people who perform a process, through the processes
themselves, ultimately to the customer and financial outcomes. In the project environment (as incorporated into the meta-perspectives), there is a similar series, although the detail of each perspective varies slightly. People play a key role in both formulations, and this also supports the notion of some degree of commonality between the formulations. However, whereas the strategic planning use of perspectives sees people as part of the causal chain, the role of people in projects is more diverse, as illustrated by the role of those who do not have an identifiable role in a particular process, but can nevertheless affect the outcome of a project.

*This suggests that the role of people in the identification of project objectives is in some way richer than for the strategic planning uses. This aspect also requires addressing by the development of theory.*

The final similarity, the link between strategic objectives and project objectives, assumes that some degree of rationality in the choice of project has occurred, and that this choice has resulted in complementary objectives. While a useful starting position, project objectives can change over time, so that while this link is a good starting point, changing objectives need to be catered for in the model. From this phase of the project emerges the importance of a comprehensive set of objectives as the base on which confidence in the measures used results. To this end, the meta-perspectives provide a starting point for identifying classes of objectives.

*At this point, it was not clear to me when thinking about the theoretical model as to what the value of the meta-perspectives was. On one hand the meta-perspectives had provided identifiable value to the project, on the other this appeared to be via the objectives. The question that required some focus was whether a key part of the theoretical model was the objectives, and in particular their origins.*

**Evaluation**

**Activities.** As has been discussed above, there was a concern on the part of the host organization to ensure that lessons learned could be transferred to other projects. This was emphasised at a meeting of the program management group:
Reiterated the need for repeatability – goal of having training material ready for next project seems to be acceptable. ....Highlights the need to examine real goals and objectives of the business owner – thus the process is acting as a checklist for project planning. The major issue is to ensure that a complete set of metrics is defined, and that these add real value to PM. (Diary note, 5 February 2002)

In order to achieve this, considerable time was invested by the project management group in reflecting on practice during the project, and how this practice would translate to other projects. The conclusion reached by the project management group was that although each project was different and it was important to work consistently through the analysis of objectives to define a set of measures applicable to that particular project (as specified by a manual), the development of a set of potentially common measures across a range of projects would provide both a check on the process itself and the possibility of saving time. Of the measures used for this project, those that related to task completion were identified as ones that would have been part of the project management process even if the methodology under test was not used. Examples of measures that fall into this category include the status update (tasks completed) and one-off measures such as reviews.

**Reflection.** The project management methodology being evaluated places equal emphasis on the process and behavioural aspects of project management. Under the former category, each organization will have historical practices that will influence what is considered important measures from a management perspective, be they cost, time, task completion or other measures. Current practice for projects is likely to reflect this general management approach, and be a common theme in how projects are managed. Thus, the emergence of a common set of measures should be expected. The existence of common or standard measures that are used regularly in the management of projects has the potential to provide the ability to be able to compare projects, both during projects and over time. While useful in management terms, the value of this is particularly relevant in multi-project programs.

*What was being suggested at this point was the need for continuity of approach between projects, not only in process terms, but also in terms of the management measures used.*
If indeed a common set of measures was a viable proposition, then the theoretical model should be able to identify the characteristics and scope of these generic measures, and in particular identify the source objectives. Thinking about this issue lead to the notion of some sort of project repository, where information from one project could be made available to another.

This possibility of a common set of measures across projects raises the issue of the difference between a project and a program, and in particular the role of objectives in each. In many circumstances, what is defined as a project is in reality part of a larger organizational initiative, commonly termed a program. These programs can also run for a period that exceeds the life of each project, and the issue of "project success criteria" over this extended time frame becomes an important question that needs to be addressed in the context of both individual projects and the program as a whole.

As part of the background work for this dissertation, the nature of ‘measures’ was explored (see Appendix D), where a distinction was drawn between horizontal measures (for within and between processes), and vertical measures (for reporting purposes). In the context of a program, it is these vertical measures that provide the between-project, or program, comparisons. In the context of this project, there was no overall program context to be considered, so there was no explicit identification of vertical measures: all were essentially horizontal measures. Further research that involves multiple projects within the same organization needs to be undertaken in order to identify and use these types of measures.

Projects that exist as part of an enclosing program have success criteria derived from the program. This can be variable, as a project may have impacts beyond and independently of the program, and may be of value even if the program "fails". In the project management methodology, this diversity is catered for in the negotiation of the objectives used as the basis of the project. Those concerned with the larger program are inherent to that program, and the program objectives form the basis for the project objectives. When considered in this way, success criteria framed in terms of cost and time are likely to be even less relevant than for stand-alone projects. This is due to the often complex relationships between projects that are part of a program, where interdependencies are multi-way: each project may depend on certain outcomes in
another in order to achieve its own outcomes. In this project, being a stand-alone project, there was no opportunity to explore interdependencies of objectives arising from a program environment.

The need to maintain a repository of objectives now emerged in my thinking about the theoretical model. With the link already established between objectives and measures, the question then became one of conceiving a model that permitted a well-defined move from objectives to measures. That is, from the goals of those involved with the project to reflections of these goals that could be used by the project team in undertaking the tasks required to satisfy the goals.

Theory Modification

Activities. In looking at how the methodology should change as a result of this iteration, two issues surfaced: the need to be able to identify a working subset of the full set of measures, and the link between measures derivation and the identification of deliverables for the project. When combined with the aim to ensure that the methodology could be used by other projects, these issues were inputs to the creation of material relating to the use of the methodology in practice.

There was also an assessment of the perceived value of the methodology. For instance, the project manager proposed that:

[An assessment of the methodology involves the] value of measurements vs the focus the process gives. General feeling is that there are two phases: identifying issues early gives most of the benefits (70%?), and the measurement process, which can provide objective evidence of progress (eg to business owners). (Interview, 11 February 2002)

The project management group discussed the above comment from the project manager, and agreed that there appeared to be two distinct benefits that flowed from using the methodology during the early stages of a project: as a cross-check for the identification of deliverables (risk mitigation), and in the usefulness of the measures in communicating with the various stakeholders. The value of the methodology in
managing the project itself remained to be established. No conclusion was reached regarding the relative value of these perceived benefits.

The theoretical model was still being developed at this point, and the perceived benefits that were identified highlighted the role of objectives beyond the immediate project team. Objectives were emerging as a central theme for the theoretical model, appearing to tie a number of ideas together, including the variety of goals that need to be considered, objectives as a way for the stakeholders to communicate, and objectives as a basis for developing measures.

**Reflection.** The management of risk together with the production of deliverables are arguably the aims of project management. The latter is addressed by the methodology through the use of objectives of the stakeholders, so the identification of outcomes, and the use of measures to achieve these outcomes, lies at the heart of the methodology. However, it is not so clear as to how the methodology contributes to improved risk management.

In principle, all possible risks can be identified and a mitigation plan developed. In practice, the cost of such a comprehensive risk management approach would be prohibitive. One of the responsibilities of a project manager is to develop a risk assessment and mitigation plan. While this plan is one of tools used to manage a project, and its development and possibly execution is independent of the measures discussed in this dissertation, there are some areas where the methodology can contribute to this risk mitigation activity. These include the explicit recognition of people as part of the project, a wide definition of objectives that includes such objectives as quality, and the use of process measures that can provide an early warning of threats to process outcomes. This possible use of the methodology needed to be assessed in the next iteration of the action research project.

**Adopting a broad definition of risk opens up a number of areas where the theoretical model can be of use to those involved with a project.** A criticism that was levelled at research that was concerned with developing lists of risk factors (Chapter 2) was that there was usually no guidance given as to which risk factors would be important for
particular projects. The challenge for the theoretical model is then to be able to provide this guidance.

Summary

The first identifiable traversing of the action research cycle resulted in several concrete results, some anticipated, some not. The process of identifying measures and subsequently using them to manage the project provided an opportunity for the project planning group to apply the methodology and appreciate its place in the overall management of the project. Unanticipated was the real benefit of the methodology in identifying additional deliverables of the project.

In the chronology of the project, the first iteration covered approximately one third of the eventual total time for the project. It had a focus on getting the project underway. The next iteration covered the period when the majority of the substantive tasks were completed, to approximately two months before the end of the project.

4.5 The Second Iteration – Project Execution

Introduction

In this phase of the project, the issues of most concern to the project planning group were related to documenting the methodology in order to facilitate portability, and the collection and reporting of the measures together with an assessment of the value of this activity.

From the perspective of the action research project, this phase was the most productive in terms of developing the underlying theoretical model to support the methodology, where the various issues and themes that emerged during the previous iteration were coalesced into a coherent model.
Situation Diagnosis and Theory Framework Evaluation

**Activities.** A constant concern transmitted to the project management group from the project office was the need to ensure that the methodology could be used in any IS project. In addressing this concern, the project planning group discussed several means of sharing the knowledge about the methodology, but had insufficient knowledge of the background of the current project managers to make a firm commitment to a particular approach. Therefore, before a definitive approach to making the methodology available to other projects could be settled, more information was required. A number of techniques were considered, including interviews, using personnel records and a survey.

Collecting the base data for the measures was emerging as an issue. Although some of the measures were accepted as part of the "normal" approach to project management, there was a difficulty in having these measures accepted by those not directly involved, especially the business areas. It is a characteristic of the host organization that there is a distinct and formal separation of project execution and the business areas ultimately responsible for the project. The net result of this was to require continual dialog to collect the required source data. The problem situation thus being faced was a lack of up-to-date source data.

**Reflection.** Applying the methodology was a front-loaded activity: there was a steep learning curve during the first iteration, followed by intensive discussions on applying the methodology. The second iteration, although the longest of the three iterations, was more concerned with observing the methodology outputs in practice and working towards making the methodology portable. Choices had been made as to which measures would be used, and the mechanisms for collecting the source data in place. Managing the timeliness and quality of this source data became the focus.

*This concern about the source data provided another perspective on the theoretical model that was now being consolidated. The main reason for the problems associated with the source data seemed to arise from the separation of the development team and the business areas, so the question posed was whether there was an alternative conceptualisation of the relationship between these two groups.*
Planning

Activities. Determination of how to transmit knowledge of the methodology to others was planned as a two-part effort. Firstly, the methodology used to derive the measures would be documented in detail, and the characteristics of the project managers determined in order to identify other (complementary) strategies that could be adopted. In order to provide the required substantive information about the backgrounds of the current project managers, it was decided to ask each of them to complete a questionnaire. This was constructed in three parts. Firstly, there was a section on objective information related to education and experience to provide the context for individual responses; secondly, an instrument to measure the perceived maturity of the organization in respect to project management was administered, taken from Kerzner (2001) to assess the perceptions of the staff about the stage of development that the organization had reached; and thirdly, free-form responses to questions related to various attitudes were asked for to assess attitudes to alternative ways of disseminating information about the methodology. A sample of the questionnaire is included in Appendix E, and the results obtained are discussed in the next sub-section.

To address the other main issue in this phase of the project, the gathering of source data, additional meetings with the business manager were arranged, with a focus on explaining the business benefits to be derived from the measures. (This was reinforced at a later time when one of the measures identified a potentially serious problem – see the next sub-section for a full discussion on this.)

Reflection. The final choice for collecting information about the current project managers was primarily dictated by the need to protect the privacy of the project managers. Those who were to be surveyed were peers of members of the project planning group, and some concern was expressed about collecting personal information and making it available to colleagues. Therefore, the questionnaire was administered electronically with returns only to myself, and I was responsible for removing any identifying information, and for summarising any information that could identify individuals. At the same time, guaranteeing anonymity in responses increases the likelihood of accurate responses to the questions related to the perceived maturity of project management practices.
Application to Practice

Activities. Despite earlier problems, the collection of the base data and subsequent analysis to produce the measures became part of the regular practice of the project team, and the set of measures selected (see Appendix F) were used by the project manager in meetings, as had been requested earlier:

> It was agreed that [the PM] would be requested to report his use of the metrics at the weekly status meetings. This will reinforce the use of the metrics and also provide some further visibility to other PMs. (Meeting notes, 25 February 2002)

The project manager carried this out with positive results:

> Me: How did you find the process of trying to quantify something that you had no great definition of what we were looking at?

> PM: VERY difficult. That sort of metric would need to evolve. I can't see anything stopping us from identifying useful metrics as a source for everyone to look at. These are the things we found over the past 50 projects were useful. For the first 20 of those projects we didn't use this metric, it's something that came about from our better understanding of mechanisms for quantifying information.

> Me: Has anybody else looked at these?

> PM: Yes, the full steering committee.

> Me: What was their reaction?

> PM: Happy! Some questioned the usefulness of some of the metrics involved. The actual project team themselves have found it all useful for keeping it on track.

(IInterview, 18 July 2002)

The project manager later expanded on his comments in a conversation:

Some of the comments [from the steering committee] were “Well, I probably wouldn't have chosen those metrics,” or “I don't see how some of those metrics would have helped.”, and “Some of those metrics things are standard project management things and I don't know that they would make any difference to the project.” My feedback is, “It's quite possible - this is an evolutionary process we're going through. I think we need to go through this cycle quite a number of times before we can come up with a set of metrics, a base group that we feel are appropriate in most circumstances and another set that we feel are appropriate in all.
The process of identifying measures using the methodology, and the results from applying them in practice received due attention from a relatively wide audience within the program management group, and to a more limited extent to the business areas involved with the project. As the above conversation extract shows, feedback was positive, although not unquestioning.

Of the measures used in the project, two emerged as key to the management of the project, in that they provided information that was not (according to the project manager) otherwise available. These were measures on 'Average time outstanding on high priority issues' (see Figure 4.5), and the set of measures related to call centre staff key performance indicators, and in particular the measures related to phone service level (see Figure 4.6).

The analysis of outstanding high priority issues shows a steady increase in the average time outstanding (labelled A in Figure 4.5). This information (available to the project manager in graphic form) was the trigger for corrective action, and a subsequent decline in the average time as the action took effect (labelled B in Figure 4.5). It emerged from discussion held by the project planning group that the use of such graphic representations of what was occurring in the project enabled earlier attention to be paid to a situation that otherwise may have caused problems later.

The project manager was able to use the graph as a trigger for corrective action:

**PM**: Some of them [the measures] are going to be used anyway, and are there any other ones that we feel are specific to these circumstances. These are the ones that we have and are there any other ones that we can add. So, start of with the high level: “Monitoring the Metrics”, there’s been one load (sic) in particular that gave me an indication that I needed to change (or more closely monitor) something, where there was high risk in the project. Actually there was two. One of them was the length of time issues remained outstanding – that had been increasing. Not the number of issues, but the average length of time the issues remained outstanding was increasing. The trend showed we were getting through them too slowly. We decided to only take one metric on that one. One, because there were more issues being produced, and two, because the issues were getting harder to resolve. Either way, it’s the same difference to me, if we don’t resolve the issues fast enough, there’s something of great concern there.

**Me**: Metrics are a jolt to say hey, something’s happening and I need to investigate further what it is. Metrics of themselves are not going to give you what...
PM: So you go to the next level of detail and say Why, or what about it, is it because the number of issues are increasing or because they are more difficult to resolve, either way, an indication there is something I needed to be aware of...

Me: So what did you do?

PM: On that one, I racked up the resolution of issues and gave it increasing priority, and I started doing much more frequent follow-ups with staff, to find out what they were doing about that particular issue.

Me: And then did the metric come down?

PM: It certainly did, we started kicking it pretty hard around about the start of April and we were getting up to 15 days outstanding on average, an issue would be. Some of that was because people had resolved the issue and hadn't updated the log, but by and large, it was that people were actively looking at the issue and following it up.

Me: How did that compare with other projects that you've done? Is it similar?

PM: I've only got gut feel on that one. I don't know. The situation there, I haven't seen that on other projects before – the rate of unresolved issues. Which indicated that the issues resolution mechanism needed to be tightened up. And we started to do that. Coming around the back end of March you can see the graph starts to level off and then you can see it drops off quite dramatically, that's when I was there pushing really hard. Something I found a lot, was the team's approach to recording issues, especially on the business side, which is where most issues came from, they would just resolve the issue within a couple of days and it would never find its way onto the log.

(Interview, 18 July 2002)

The graph of phone stats (Figure 4.6) shows a rapid decline in service level over a two-month period that corresponds to the stage of the project where the move of the call centre changes from being seen as "being planned" to "being real" (labelled A on Figure 4.6). The project manager explained that the measure was derived from figures provided by the business units, rather than collected by the project team. In addition, undertaking any corrective action would fall outside the scope of the project team. However, successful resolution would affect the ultimate outcome of the project.
As the project manager explained:

PM: The other one, was the business, and the information about the level of quality from the business, in terms of audits that were taking over the work they were doing. The purpose of that metric was to see the impact, or to give us some heads-up of the capability of the existing department to do the work, the existing people in [City A]. Knowing that they’re going through a wind-down phase, and a relatively rapid wind-down phase, keeping an eye on the quality of what they’re doing as an indicator to say that things are still fine, that we don’t need to ramp up, or make a change in the way that things are implemented in [City B]. What we saw, we got a number of weeks of information and then the people who provided the metrics to us, got too busy on other things and stopped, so we got a big gap and then we finally got some other stuff coming in. What it was indicating at the time was that quality levels were dropping off.

Me: What sort of actual measures were you making of the quality levels?

PM: The actual measures were warnings that come out of the system. The system generated each piece of business that’s written, if it either falls outside of our guidelines that our program in the system, or is something that raises a warning, for example, a male driver aged 20 - immediately indicates a warning which says that someone else should be looking at this. Or there should be detailed description of why we should let this business through. That gets audited and reviewed by our senior underwriters on a monthly basis.

Me: So it’s the business being written that you’re monitoring
PM: Yes the quality, not the quantity. As a leading indicator that if quality dropped off, it was providing indicators that tensions existed in the team, either they were experienced staff walking out the door, they had to bring in temps who didn’t understand the business, whatever. An indicator there that in the future that the pressures that were put on business unit, that says as an unsustainable unit in [City A], we need to get the stuff in [City B] set up faster. Which was a particular risk, because we were already going as fast as we could. The indication was that the centre in [City A] was collapsing or in the process of collapsing, so let’s wrap it up now. Fortunately that didn’t happen, but the indicators were that in a number of areas, quality was dropping off, a steady decrease.

Me: And the response was?

PM: The business put in place a few more checks through their team leaders. I didn’t have a lot of control about the response, because at that time, they ran out of time. The people who were recording the metrics, didn’t have time to complete them. They were actually pulled into the corrective actions.

Me: I think you mentioned that the people doing the metrics were the ones going around fixing the problem.

PM: Yes, going around, doing education. There was more of an issue of education for temporary staff than experienced staff who were becoming increasingly dissatisfied with the work environment and walking out the door.

Ironically, now we’re into the last month, that has come to the forefront as a major concern, a major issue, existing staff are particularly unmotivated and disgruntled.

Me: Are they going to lose their jobs?

PM: Oh yeah.

Me: Well you can understand it from a human point of view.

PM: Perfectly understandable, in fact I consider it lucky that they’ve kept their level of motivation relatively high up to this point in time.

Me: Was that identified as a risk early on?

PM: Yes it was. Hence the importance of this metric was one measure that you could take, certainly all the way through the business we were very concerned, in the project that three months in, there’d be a mass exodus, and staff would just walk out the door.

Me: Did you share these particular concerns with business..?

PM: Yes, absolutely. They were happy they were recording metrics, but basically they just classed it that we were just doing our jobs. “Thanks that you noticed that”. To be honest, they did put in place corrective measures that might not otherwise have been known about or put in place. Not in this sort of format. Each month they’d take the figures, but there was no formal reporting / recording mechanism or even a graphic of these things so that you could get an easily identifiable picture.
This trend was interpreted as a possible morale problem with the call centre staff, given that the workload had not changed significantly (labelled B in Figure 4.6). [Decreased workloads generally result in an increased service level, as illustrated at label C on Figure 4.6.] In the context of using these measures as part of managing the project, it should be noted that the base data is collected automatically, and is not normally analysed for some time. It is therefore unlikely that the concerns of the call centre staff would have been detected if the methodology had not been used.

**Figure 4.6: Service Levels versus Work Load**

(From Metrics Spreadsheet Version 5)

These two examples provide an insight into the areas where action is initiated. In the first instance (outstanding issues), the responsibility lies within the project team, yet requires some involvement of people outside of the team. The second instance (call centre statistics), involves action being taken almost entirely outside of the team, although the outcome affects the outcome of the project. This again raises the issue of
separation of the business areas and the project team, further indicating that the theoretical model needs to integrate these two groups.

The documentation of the methodology used was carried out primarily by myself, with review comments and suggestions from other members of the project team. A copy of the initial version is included in Appendix G. Preparation of this manual provided an opportunity to reflect on the methodology and to incorporate a major outcome of the first iteration: the need for a subset of the measures that would actually be monitored.

At this stage, the theoretical model was not in a form suitable for inclusion in the manual. This posed no problems for the project management group, as there was a conscious decision taken to separate theory from practice in the manual, reflecting the separation of theory and methodology-in-use that was discussed in Chapter 3.

The report I prepared on the questionnaire relating to the background of the current project managers is included in Appendix H. Most respondents had a Bachelor's degree, with an emphasis on computer science; training in project management was primarily in-house short courses. Experience was highly variable, from less than six months on small projects to many years on a variety of projects, which were both business-related projects and IT-development projects. The analysis of the maturity of the existing project management practices revealed that the group as a whole were at the second of five stages of the scale used; the major issue was that there was little understanding of the need for project management by the business clients of the group. This was reinforced by the third part of the survey, which revealed that there was little involvement of end users in their projects.

Reflection. Historical precedent aside, there is no reason to expect that a project will always have difficulties, nor is it clear what issues will arise as problems for a particular project. If it were possible to predict the problem issues, management of these issues would be straightforward. [A distinction is being made here between managing an issue and resolving an issue.] It is therefore necessary to "cover all bases" when measuring characteristics of a project for the purposes of managing that project. The net result is that many of the measures will not show any deviation from the expected. This was the
case in this project, where the majority of the measures showed "business as usual". Yet the two that did not behave as expected yielded significant information for the management of the project.

An additional observation arises from these measures: measures in combination may have the potential to reveal what is happening in a project whereas measures in isolation do not. In the case of the call centre statistics, the full picture does not emerge until the service level is considered in conjunction with the workload, and historical trends are also used.

The background of the current project managers prior to being appointed to that position shows no bias for or against business versus technical backgrounds. There is little evidence of project manager roles being seen as a career path for people from line management positions, but rather is seen as a promotion path from business analyst or IT specialist. With one exception, none of the current project managers have formal qualifications in human relations / psychology / social science. This raises questions about what are appropriate backgrounds and qualifications for project managers. Although further analysis is required, the training provided to these current project managers reinforces the managerial (or modernist) view of the role of project management. The short courses mentioned by the respondents in the survey have a focus on the mechanics of project management, such as planning, scheduling, monitoring and reporting. The tentative conclusion is that the "hard" skills, based on a technical background, provide the preferred profile of a project manager.

The theoretical basis for the methodology was being developed by me during this period, and the insight into this practice of reinforcing the technical facets of the project managers provided an impetus to ask what other (possibly alternative) qualifications, experience and training could be used. Alternatively, was there a case for separating the various roles of the project manager?

The lack of involvement of end users in projects (as revealed by the survey) became one of the pivotal issues in the development of the theoretical model. Despite there being a co-operative attitude existing between the project team and the business owners, those
actually affected by the project were not considered as needing to be involved in the project (an attitude possibly arising from their managers). The question then becomes what the benefits of having a much more involved user community would be to the overall project, and what the impediments to this would be.

Evaluation

Activities. There were two major activities in this stage of the project: the consolidation of the measures into the day-to-day management of the project and preparations to enable the transfer of knowledge to other projects. Each of these provided ample opportunities for members of the project planning group to debate various options for the future. In respect of the measures, discussions centred on the selection of measures appropriate to a particular project; in respect of knowledge transfer, the debate looked at the balance of theory and practice that would be appropriate to the intended audience.

One way of identifying objectives for a project is to broaden the scope of involvement, particularly to the business areas, as identified by the project manager:

Me: What should we do to discover what the objectives are?

PM: I guess some of the areas where the more beneficial objectives I found came out of the business area. Particularly in the business field. For example, the project has now pretty much moved into a transitional phase, the construction is all done. We are now in the process of shutting down the [Qty A] site, and moving over, in as controlled a fashion as possible to [Qty B] as fast and completely as possible. That’s where the theme of the project has shifted, that’s where the risks have now shifted to. The concentration of management effort is now on making sure things don’t get missed. I don’t think we adequately covered that in the objectives. The whole are with this particular project, of how are we going to make sure that we have adequate transition plans in place the stuff that basically isn’t getting used. We haven’t set up the situation so that the people in the new site aren’t going to be in the positions where they don’t know how to do something and there’s going to be no-one left behind to tell them how to do it.

(Interview, 18 July 2002)

As another approach, the project planning group looked to more precisely identifying two sets of objectives for the projects: those that were unique to the project, and those that were generic to projects. In the former category for this project, unique objectives include service delivery levels, the need for ongoing recruitment and training resources
and accommodation occupancy and exit dates. Objectives in the generic category include quality, reporting and staff development. A comprehensive set of objectives and a classification of these for relative importance provide a basis for defining a set of measures for a project.

No definite conclusion was reached regarding the most appropriate way to balance theory with practice in moving the methodology to other projects. This was due to the wide range of backgrounds and experience levels of the current project managers. However, in order to move the issue forward, it was agreed that during the next use of the methodology, some background to the underlying theory would be provided to those who expressed an interest, with the documentation to be updated to include some theory material.

**Reflection.** The selection of a cost-effective set of measures has been discussed above, and the continuing discussion on the selection of measures for a particular project turned to a debate about the cost-effectiveness of using the measures. This topic was of particular concern to members of the (action research) steering committee, who in addition to dealing with operational matters became involved in the debate about the cost-benefit of the methodology. From the perspective of the senior managers, it was important that any change to practice was going to add value to the overall process of managing projects. This became a debate about tangible costs versus intangible benefits.

The difficulty expressed by some was that the measures identification process, and the collection and analysis of the base data required an identifiable expenditure of (especially) time. The counter-balance to this cost was a premise of improved risk management. There is no definitive answer to these concerns, however the project planning group reached the conclusion that the process overall was worthwhile, based on the evidence of this project, with the caveat that the identification of a small set of measures critical to each project provided a balance between time and benefit.

*This conclusion proved to be important in the context of the development of the theoretical basis of the methodology. It reinforced the value of the research methodology (that is, action research) used. One of my aims was to produce a methodology that could be used in practice, in contrast to research that draws general*
conclusions but offers no guidance for particular cases. An example of this latter type of research is the development of key risk categories that highlight the common risks faced by IS projects, and imply that these risks need to be assessed for each project. However, little guidance is provided as to which category of risk may be important for a particular project, leaving it to the project manager to somehow select which to manage. The alternative is to provide a prescription of how to determine which risks are more likely for any given project.

In using the methodology to select a set of measures, the project planning group concluded that it provided guidance to those using it. With its focus on the objectives that are unique to a particular project (such as maintaining service levels), yet also including objectives of a more general type (such as quality), the methodology identifies those measures that are likely to enable better risk management for a particular project. In this way, the methodology provides a practical tool.

The question of how many measures should be used remains, and this question needs to be answered in the context of each project. One step in the methodology calls for an assessment of the relative importance of each objective to be assessed, and therefore the importance of each measure associated with the objective can inherit this level of importance. In principle it is possible to rank the measures; in practice they tend to fall into groups (critical, very important, and so on). This need to provide a ranking of measures also had an impact on the development of the underlying theory in that the concept of 'consequences' became part of the analysis of expectations.

In terms of the theoretical model, it became apparent that the multiplicity of views (here, the steering committee, the project manager and the business areas) resulted in a lack of agreement as to what the important objectives were, especially in terms of project success. Therefore, the theoretical model has to address this issue of many viewpoints on project success.
Theory Modification

Activities. By the end of this phase of the project, the project planning group achieved general agreement on the value of the methodology, and a growing understanding of how the methodology should be applied. Nevertheless, it was agreed that several iterations of the methodology on a variety of project types would be of benefit. This aside, the documentation represented an identifiable expression of the methodology that reflected practice.

One of the important insights of this iteration was the articulation of the importance of people in systems. Although there is an expressed ‘concern’ for the centre operators, there is little evidence that these people were engaged in working through the issues in order to reach a conclusion (for example: “we were very concerned, in the project that three months in, there’d be a mass exodus, and staff would just walk out the door”). This was one trigger for using critical social theory to inform the theoretical model.

However, by this stage, the overall shape of the theoretical model had been determined, although work remained to be done to integrate the methodology and the model. This was primarily in the area of terminology (definitions). For example, instead of talking about ‘objectives’, the preferred terms became ‘expectations’; instead of ‘stakeholders’, ‘constituents’.

Reflection. The conversations held between members of the project management group are an illustration of the value of sharing information, both in formal settings (for example, status meetings) and in informal settings (for example, to discuss issues). In this project, the continual interaction between the members of the project planning group provided each with an opportunity to internalise aspects of the methodology and its implications for practice. In the context of this research, reflecting on this learning provided me with an insight to the importance of knowledge management in a project.

The opportunity to engage in conversations and to express opinions, reservations and conclusions led me to consider more deeply the issue of knowledge sharing in the
context of the theoretical model. From this reflection, knowledge sharing became one of the key defining characteristics of the model.

Summary

The second phase of the project identified the substantive results of applying the methodology. The measures identified in the first phase were collected and analysed in this second phase to good effect, with two of the measures providing the project manager with information useful in managing the project. From this, tentative conclusions about the usefulness of the methodology can be drawn: providing time is spent in developing a complete set of objectives, the resultant measures do provide a useful tool for project managers.

From the perspective of the action research project, the research methodology proved to be an excellent framework within which to analyse and understand what was happening in the project. By using the five stages of each loop as the basis for discussion, the project planning group was able to make substantial progress in learning about the methodology.

*In terms of the development of the theoretical model, I found the framework supportive of the intellectual task of synthesising the various issues that arose during the project into a coherent whole. By using the notion of the two cycles (the substantive project being undertaken for the host organization and the research project) and the five stages as points of focus, it was possible to identify the issues from the substantive project, use these issues to expand the theoretical model, and then feed this enhanced model back to the substantive project.*

4.6 The Third Iteration – Project Closure

Introduction

This was the final phase of the project, insofar as at the conclusion of this phase, the project was considered to have met its expected outcomes. In terms of the timeframe of
the project, this phase covered the last two months, and from a project plan perspective, was mainly concerned with commissioning the new call centre and decommissioning the old one.

From the point of view of the research project, this phase provided the opportunity to consolidate the learning that had occurred mainly during the immediately previous phase. This took the form of finalising the documentation of the methodology as it was to be applied in the next project.

Situation Diagnosis and Theory Framework Evaluation

**Activities.** By this stage, the project was running basically to plan, and the measures in place did not reveal any situation that required special attention. The measures that had been the subject of extra focus in the previous phase now showed trends and values within expected ranges.

Therefore the project planning group turned its attention to the issue of transferral of the methodology to the next project. By this time I had prepared the documentation of the methodology, so it remained for the project planning group to finalise this document in terms of its content of process as balanced by some theory.

**Reflection.** The issue of transferability remained the main issue for the research project steering committee. This concern arose from the imperative to ensure that changes to practice within the PMO were cost-effective. As discussed above, striking a balance between direct costs and indirect benefits is not straightforward, however, the experience of this project provided evidence that there were benefits that resulting from using the methodology.

**Planning**

**Activities.** The plan drawn up at this stage did not contain much detail that was not in the original project plan, beyond adding some meetings to consider the methodology documentation.

**Reflection.** The original project plan (drawn prior to project initiation) did not include any tasks that the adoption of an action research approach may entail. As these were
relatively minor in terms of resources compared to the other tasks, they were fitted in to
the short-term schedule on as as-needed basis. From a project planning point of view,
this flexible approach to task management enabled the measures being used to influence
the short-term tasks, rather than cause a significant change to the schedule as published.

**Application to Practice**

**Activities.** The existing call centre was decommissioned successfully, and its
replacement came online without major problems. The identification of the deliverables
(especially those related to training and the ongoing operation of the call centre) as
required by the methodology was seen as contributing to the overall success of the
project.

The measures selected for monitoring tracked within accepted bounds, for example, the
Outstanding Issues measure (see Figure 4.7). As shown by the graph, the corrective
action that was initiated towards the end of March resulted in a decline in the number of
outstanding issues to a steady-state situation.

The documentation of the methodology was completed insofar as the version suitable
for the next project was concerned. In the end, discussion on theory was constrained
mainly to the introduction, so that those not interested could skip this material without
jeopardising the application of the methodology.

**Reflection.** Meetings to exchange views (together with informal one-on-one
discussions) continued to be an effective means of sharing knowledge. When this is
considered in conjunction with experience arising from practice, those participating
believed that these two aspects to knowledge acquisition and dissemination were
important to the success of the action research methodology. While it was
acknowledged that different levels of expertise existed in different people, the
communication of differing insights enabled all involved to be able to access particular
knowledge when needed.
One aspect of the theoretical model that required further work at this stage was concerned with the concept of a knowledge repository. This was not conceptualised as being a computer-based repository, but rather a combination of information management facilities and the means for individuals to “know” where knowledge they required was (possibly in other people). This is the concept of transactive knowledge systems, and the insights provided by the meetings discussed above provide an example of these systems in practice.

Evaluation

Activities. The post-implementation review for the project was outside the timeframe of the project as initiated, so no definite conclusions can be presented here. However, the measures that were collected support the interim conclusion that the project was a success from the point of view of time and budget, in spite of the time required to collect and collate the measures being more than anticipated, as the project manager commented:

PM: Yes, when I said weekly, I’ve now changed that to biweekly, every two weeks. The main reason is that there’s quite a bit of effort and work involved in capturing
the metrics. Probably more than I thought. I thought the metrics would come out of the weekly status meetings. I guess the amount of effort in actually following this stuff up and actually getting the metric recorded was too much for a weekly basis. Do I need to do it on a weekly basis? The amount of time I have now is quite precious and I don’t have assistant staff who can do that at this point.

Me: How long does it take you?

PM: About three hours a week. Not including the status meeting, but I needed the follow-up meetings to get the information out of staff. Original thoughts were about an hour a week at most, and that didn’t eventuate. Probably something that (inaudible) given that you would have probably measured something at some time anyway, how much extra did you do, was it because it was formalised? Probably because it was formalised! And you can actually attribute something to it. If we’d just left some of these things alone and then found out this situation is critical and it’ll take us three days to address, then you think of this as a different thing altogether. Looking back, the benefits that I got out of this exercise, definitely the process of identifying the metrics helped in two parts. It helped solidify the requirements for the project, in terms of the way the project was going to be managed and the processes for managing it, and in some instances the requirements for the actual project deliverables.

Me: Can you give me an example?

PM: Yeah one of the things we were looking at originally was the operational plans for the centre. They hadn’t really been thought about until we were going through the discussions and narrowing down the metrics to the final set. So even though monitoring the operational plan was not a metric that reached the final set, it was identified and that was the first point where we identified it as something we really needed to do, we really need to identify and plan out how the centre will be running and operational.

Me: So that was when we going through the objectives.

PM: We got a lot of benefit up front, helping solidify the management processes upfront. A lot of the scheduling of things that needed to be done to make sure that the project went well, and the status and the updates of the project were already being done on a regular basis. The mechanism of capturing the metrics and analysing them for anything that we needed to be aware of, was of a lesser benefit in this particular project, because there wasn’t that much going wrong.

(Interview, 18 July 2002)

As the project manager explains, the overall project was considered by the host organization to be a success (at least in the short term), and the methodology trialed as part of the research project contributed to this success. Whether it will be considered a success in the longer term remains to be determined. From the customer’s perspective, the change of location appears to be transparent. From the point of view of the cost of ongoing operation, the line area responsible for call centres will need to manage those
aspects that initiated the move. The remaining criteria that related to the staff of the call centre remains somewhat problematic, as it is not so clear that success criteria based on the needs of this group have been met.

**Reflection.** The objective of providing a smooth transition for call centre staff from the perspective of job loss was never stated explicitly: it was taken as being desirable, but no parameters for measurement were set. This ignoring of what would appear to be important criteria for success from a holistic point of view was the impetus for the researcher to refine the role of people in a project. While the methodology identified people as one of the meta-perspectives, this was mainly from the point of view of those undertaking project processes. The emergence of objectives arising from those affected by the processes caused a broadening of the way people participate in a project.

*This broadening of the view of people in projects became a fundamental part of the theoretical model, consistent with critical social theory.*

**Theory Modification**

**Activities.** The project was formally wound up, claiming success in achieving the expected outcomes in terms of moving the call centre. The manual as prepared was accepted by the program office as input to their next project.

**Reflection.** From the point of view of the action research project, the project proved to be an ideal vehicle for trialing the methodology. The key to this success was the participatory relationship between myself, the project team and the project planning group as a means of influencing how the project was carried out. The second major contributor to success was the way in which knowledge was shared, and the role of knowledge from practice in providing common ground for discussions.

*The development of the theoretical model by myself was both influenced by and influenced the project. The insights provided by the tasks in the project raised issues that the model had to address.*
My major point of reference for the project was the project manager (as evidenced by the number of quotations included in this chapter). This was seen by the (action research) steering committee as the most appropriate contact, as he was given the responsibility for achieving the project’s goals. In looking back at the project, it was apparent that in reality the project manager was more of a task manager: any substantive issues relating to budget, time and resources were the purview of the project steering committee. The theoretical model needs to reflect this reality.

Summary

This phase of the project provided the opportunity to consolidate the knowledge gained about the methodology as applied to the project. The major gain was the influence of the success criteria associated with the call centre staff on the formulation of the model.

4.7 Conclusion

Formal contact between the researcher and the host organization has ceased. However, there is still occasional contact with members of the project planning group in relation to matters about the methodology. Preliminary discussions are being held to undertake further projects in the organization.

This chapter has reported on the conduct of the action research project, the research methods used to address three of the research questions posed in Chapter 2. During the action research project, the characteristics of project management arising from the methodology (Research Question 1) were used to inform the development of the theoretical model, resulting in a model grounded in critical social theory. The methodology initially used in the project was modified during use as insights were gained from that practice, and from the parallel development of the theoretical model; this culminated in a manual for practitioners (Research Question 2). As reported by the project manager, indications are that the methodology contributed to the overall success of the project: two of the measures caused action to be taken that otherwise may have been delayed to the detriment of the project (Research Question 2A).
Throughout this chapter a number of characteristics important to the development of the theoretical model have been uncovered and used in the aspect of action research related to theory development. These characteristics (in summary) include:

1. The variety of people involved with the project: identifying objectives, establishing success criteria, responsibility for taking action.

2. Management problems arising from having a separate development team: using overall goals to guide the project, relying on people outside of the team, consistency of data for the measures, the multiplicity of skills needed by a project manager, the existence of a steering committee that managed the project in practice.

3. A knowledge sharing environment: to act as a co-ordinating environment for the diversity of objectives, to enable an understanding of with whom particular knowledge resides, to act as a focus for conversations regarding the project, to enable consistency across projects.

4. The importance of people: in working through issues, as those ultimately affected by the change.

5. A wider timeframe for projects: some objectives are relevant outside of the traditional begin and end dates of projects, as a mechanism for organisational change.

6. Objectives as a central theme: a full understanding of the objectives can add real value to a project, in particular when these objectives are used to define useful measures for the project manager.

7. The importance of practical prescriptions: to be able to provide guidance for the conduct of particular projects.

These issues form the core of the theoretical model – the principles that the model has to address.
The next chapter describes the theoretical model in detail, and this is followed by Chapter 6 that describes the use of meta-study to provide an independent evaluation of the model. This is then followed by a detailed discussion of the research.
Chapter 5: Developing the Theory-Based Model

5.1 Introduction

The previous chapter of this dissertation described the action research project through which the characteristics of a theoretical model of IS project management emerged. This model is based on a collaborative/social-intervention view of IS projects as defined in Chapter 2. The characteristics that a theoretical model is required to address are:

1. The variety of people involved with the project: identifying objectives, establishing success criteria, responsibility for taking action.

2. Management problems arising from having a separate development team: using overall goals to guide the project, relying on people outside of the team, consistency of data for the measures, the multiplicity of skills needed by a project manager, the existence of a steering committee that managed the project in practice.

3. A knowledge sharing environment: to act as a co-ordinating environment for the diversity of objectives, to enable an understanding of with whom particular knowledge resides, to act as a focus for conversations regarding the project, to enable consistency across projects.

4. The importance of people: in working through issues, as those ultimately affected by the change.

5. A wider timeframe for projects: some objectives are relevant outside of the traditional begin and end dates of projects, as a mechanism for organisational change.

6. Objectives as a central theme: a full understanding of the objectives can add real value to a project, in particular when these objectives are used to define useful measures for the project manager.

7. The importance of practical prescriptions: to be able to provide guidance for the conduct of particular projects.
Having a sound theory-based framework for IS project management will enable coherent prescriptions for practice to be developed. These prescriptions, in the form of practical methodologies-for-use (as defined in Chapter 3), can then be used by practitioners to manage their projects. The coherency provided by the theory-based framework means that there can be a consistency in the underlying philosophy of the developed methodologies-in-use, enabling them to be more easily used together within and between projects. Common principles and attitudes will be able to be used in a variety of projects, supporting learning between projects.

This chapter describes a theory-based model that incorporates these characteristics. To provide a solid grounding for the model, recourse is made to Critical Social Theory, especially in its application to administrative planning and policy areas, where it has been termed critical pragmatics. Therefore, the next section of this chapter contains a discussion of Critical Social Theory and critical pragmatics and their application to information systems, and to IS project management in particular. This is followed by a detailed description of the components of the model. The final section revisits the measures-based methodology used in the action research project and discusses some changes implied by the model.

5.2 Theoretical Foundations

The discipline of information systems is intimately concerned with both technical and social issues: one the one hand there are the pragmatic, day-to-day concerns related to the deployment of technical artefacts, on the other the longer-term issues relating to the people and the institutions within which they exist. This duality is reflected in the variety of definitions of IS presented in Section 2.3 of this dissertation, for example: “Information systems are organizations where people, usually with the aid of technology, perform their duties and carry out business activities. These systems therefore are social systems.” (Liu, Sun, Dix et al. 2001, p229). Conventionally, IS project management has reflected a focus on the technical aspects of IS – this dissertation argues that the social aspects require an equal emphasis. In proposing a model of IS project management that reflects this duality of technical and social issues,
my underlying position on the role of people as part of the IS is that there is a moral
imperative to work towards systems that enable people to be creative, productive and
exercise judgment in how systems are used.

This imperative for explicitly addressing the role of people in IS (and therefore in
building IS, that is, through IS development approaches and project management
practices) can be examined through the mode of inquiry adopted: technical, where the
focus is on prediction and control, practical, where the emphasis is on human
interaction, or emancipatory, where the emphasis is on providing an environment where
argument can be used to change the situation (Boudreau 1997). An alternative (though
compatible) approach is to use a systems perspective: positivist, where predictability
and instrumental control are considered necessary criteria for knowledge validation,
interpretivist, where the situation as revealed shapes the outcomes, and critical, where
equality and emancipation are the central themes (Tsoukas 1992). Positivist social
science accepts the world as it is (Calhoun 1995), whereas the principal goal of
emancipation is to enable people to realise their needs and potentials (Hirschheim and
Klein 1994). Therefore, the moral imperative underpinning the model proposed in this
dissertation is encapsulated in the notion of emancipation, defined in this dissertation as
“providing an environment where argument based on the principle of creating systems
that enable people to achieve individual needs in addition to the needs of the
organisation is accepted by all parties”; this implies that all participants are valued
members and that power differences are surfaced as part of the argumentation process.
This definition of emancipation is consistent with previous use in IS literature
(Hirschheim and Klein 1994, Boudreau 1997, Alvesson and Deetz 1999) but not
necessarily with common usage, where it is often considered to be synonymous with the
concepts of equality and freedom.

Critical social theory (CST) has emancipation as one of its basic premises (Ogbor
2001), expressed as a desire to create systems (and thereby societies in general) that are
the result of input from all concerned, with an explicit recognition of human needs in
balance with the need for progressive development (Alvesson and Deetz 1999). In
producing knowledge from this emancipatory viewpoint, CST explicitly separates itself
from both functionalist and interpretivist approaches by adopting an epistemology that
rejects the assumption of the self-evident nature of reality (Carr 2000). In particular,
CST is based on the belief that studying people is fundamentally different from studying the natural world, that inquiry into the activities of people in a social setting needs to focus on understanding within that setting, and that any inequities of the setting as perceived by the participants be subjected to critique (Ngwenyama and Lee 1997). In the context of IS project management, a model based primarily on CST would have as central themes people in their particular social setting the identification of the reasons why systems development activities often fail to take advantage of the opportunity to change things for the better (accepting the status quo) and to seek ways to address this situation.

Change is one of the key agenda items of CST, especially change in society at large. The critique of inequities is seen as a way of disassociating the quest for new knowledge from the established order, particularly the inequities present in institutions (Ogbor 2001). While CST seeks to understand the current reality, it does not look to generate theories that mirror this reality, but to move to different views of reality (Carr 2000). Central to this aim of critique is the need for critical reflection, especially on assumptions (Boudreau 1997), thereby requiring scepticism of its own doctrinal position (Carr 2000). The end result is a mode of knowledge discovery that seeks to go beyond the familiar and recognise other possibilities (Calhoun 1995). For IS project management, the possibility is for a means of developing systems that both emancipate the people and advance an organization through the exploitation of technology.

However, an unswerving focus on emancipation would deny my professional experience, where the need to actually achieve outcomes has been central to how I have managed projects. This gives rise to my operational imperative underpinning the model proposed in this dissertation: the need for practicality in application.

Pragmatism as a philosophy may be characterised by a denial of the theory versus practice dualism, accepting the ultimate fallibility of claims, the emergence of the individual from dialog with the community at large, the refusal to be defined as a set of definite principles, the pervasiveness of contingency in affairs, and an acceptance of the plurality of ideas (Garrison 2000). These defining characteristics of pragmatism as a philosophical standpoint can be used to shape the definition of ‘pragmatism’ used in this dissertation: “an acceptance that initial and/or theoretical formulations of a problem and
its solution may be imperfect, requiring both adjustments as time progresses and the
exploration of alternatives as well as complementary explanations and approaches”.  
This definition still requires rigour in seeking solutions to problems, with (for example)
recourse to generally accepted practices, standards and theories. This definition is
significantly different from the common usage of the term ‘pragmatism’ adopted by, for
example, Critical System Theorists, who use the term as implying that so long as it
works in practice, it is acceptable (Jackson 1987). The research described in Chapter 4
has a strong link between theory and practice, for while these are conceptualised (along
with methodology-in-use) as three distinct stages in research, this is for understanding
and application: there is a continual movement between each stage, and there is no
suggestion that the stages are incommensurable. Practice in IS projects often requires
moving forward without perfect knowledge, so actions are based on possibly imperfect
decisions: what is seen to be an ideal solution to a problem at one time may turn out to
be less ideal later – contingency and fallibility are ever-present. Each IS project presents
its own problems, and for the project manager to be able to draw on a comprehensive
body of experience so as to be able to acknowledge and use alternative ideas reflects
pluralism in action. Pragmatism as defined here offers a consistent theory to support the
operational imperative, especially the characteristics of contingency and pluralism.

In an analysis of pragmatics and critical theory as applied to public administration and
planning, Forester (1993) argues for critical pragmatism as a theoretical basis for
action, especially in the management arena. In his analysis, he calls for a marriage
between the view that in the “real world”, managing cannot be practically concerned
with ethics, democracy, freedom and participation, and the need to provide these
managers with a sense of “right action and good design, … pragmatics with vision”
(Forester 1993, p39, emphasis in original). In distinguishing between three forms of
rationality as the basis for determining how to meet this call – purposive-rational
(instrumental), systems-rational (cybernetic) and practical-rational - Forester (1993)
argues that only the last provides the necessary vision, as it alone is based on the
premise that “facts” are social products, being historically contingent and socially
constructed. The crucial difference is that the practical-rational view asks the question
“for what?”, the instrumental and systems views do not.
This melding of critical theory with pragmatics in critical pragmatics provides the foundation for the model developed in this chapter. While linking these two philosophies has been criticised (for example, Zanetti and Carr 2000), others believe that each can inform the other (for example, Evans 2000, Garrison 2000). The view adopted here is that the key concepts of each philosophy (emancipation and change from critical theory, and contingency and pluralism from pragmatism) are compatible, and provide the necessary foundation for the model developed in this chapter. However, it is acknowledged that further analysis is required to better understand the subtleties of bringing the two together.

While critical theory provides the theoretical foundation for the principle of emancipation, it remains to establish how emancipation may be achieved in practice: the notion of discourse is one possible solution. One of the key concepts of critical theory is critique, especially critique based on Habermas’ theory of rational discourse. In this theory, an assumption is made that all parties accept the ideal of rationality, so that assertions made by the parties are not based on individual agendas, but rather occur in a situation where all parties are equal and neither dominate nor deceive one another (Habermas 1984). In order to legitimately use rational discourse as a foundation for a model of IS project management, the key question that needs to be answered is whether rational discourse can be practically realised in the context of IS projects.

A deconstruction of the discursive principle – “the methodological concept of validating claims to knowledge and rationality through intersubjective argumentation among those concerned and qualified” (Ulrich 2001, p68) – provides one avenue for seeking an answer to the question of the legitimacy of rational discourse for IS projects. That is, validating knowledge claims presupposes willingness on behalf of the participants in a discourse to both make assertions and to challenge them. Moreover, this testing of validity claims requires both a common desire to reach understanding, and trust in the process. A debate (argument) about the validity of knowledge claims can then proceed. For IS projects to be grounded in rational discourse therefore requires that there at least be common goals and trust, that is, all operate with a basic set of norms (Ngwenyama and Lee 1997). Operationally, this requires that all participants are given an equal opportunity to participate, that they are not constrained by supervisor/subordinate relationships, that challenges to claims made by participants be respected and that all
expressions of concerns and doubts are treated as being equally valid (Hirschheim and Klein 1994). To incorporate these requirements into IS projects is going to require new, more socially open methodologies, accompanied by new institutional arrangements to support them (Lyytinen and Hirschheim 1988). To realise emancipatory ideals in IS project management practice requires that the model address the requirement for open discourse between the participants.

Conceiving of IS project management in terms of an open discourse is not necessarily obvious, especially as there is a dominant technology focus (Lyytinen and Hirschheim 1988): it is necessary to incorporate discursive processes into development and project management methodologies. However, the diversity of existing discourses (from the techno-centric discourse of the developers, through the managerial discourse of senior management to the operational discourse of the end users) means that achieving an effective discourse that all can participate in may be no easy matter, as the resultant discourse is different from all of these diverse background discourses (Calhoun 1995). Open discourse as grounded in critical theory contains one means of resolution of this problem, for only by critically questioning statements and their meaning can misunderstanding and non-understanding be surfaced. What then emerges is the project discourse, different from the discourses of participant groups, but representing the outcome of participating in argumentation grounded in CST principles.

While consensus is the ideal outcome, this may not be achievable in practice, due in part to the different social worlds inhabited by the members of the project discourse (Calhoun 1995). What may be achieved is often “adequate mutual understanding for the pursuit of various practical tasks in which [the participants] are mutually engaged” (Calhoun 1995, p51). In a practical sense, this conceptualisation of discourse supports the existing notion of user involvement, but adds the ethical imperative of involving people in improving their work arrangements (Hirschheim and Klein 1994). The project discourse, grounded in the principles of critical theory and recognizing the multitude of backgrounds that shape this project discourse, becomes a key concept of the model developed in this chapter.

A key issue that arises when a project is conducted using an open discourse grounded in the emancipatory principles of critical theory is the decision regarding who is and is not
part of the group engaging in this project discourse. Potentially the group could be very large, including as it should all of those that have an interest in the outcomes of the project. For practical reasons, there needs to be a judgement made as to the composition of this group. However, this judgment raises two important concerns: what are the norms by which the judgement will be made, and to what extent will the judgement reinforce the power relationships that can threaten the emancipatory agenda. In a real sense, the establishment of norms is the genesis of the project discourse, and as has been discussed earlier, this discourse is distinct from the discourses of individual participant groups. Therefore the establishment of explicit norms (in terms of words and their meaning and interpretation) remains problematic (Tenkasi and Boland 1996).

A possible resolution of this problem, and the concern with implicitly accepting existing power relationships, is to use a process of discursive analysis to surface and debate the implications of decisions. Ulrich (2001a) uses the term ‘boundary judgments’ to refer to the delimitation of the groups of people involved and their reference systems, and ‘boundary critique’ to refer to the process of surfacing the judgments, exposing their implications, and examining the ways future validity claims will be affected. In expanding on this idea, Ulrich (2001a, p94) identifies twelve boundary categories as part of the boundary critiques process: client, purpose, measure of improvement, decision-maker, resources, decision environment, professional, expertise, guarantee, witness, emancipation, world view. These categories then form the framework with which to address three boundary issues (Ulrich 2001a, p95): to identify and unfold systematically the issues raised by a claim, to address concerns other than those privileged by the present situation, and to identify and challenge claims to knowledge and rationality that are not otherwise declared. The challenge from an IS project management perspective is to place this process of boundary critique at an appropriate point in time so as not to constrain the project before it has had a chance to develop its project discourse while at the same time moving towards practical outcomes, that is, achieving a balance between the moral imperative and the operational imperative.

Within the diversity of an IS project, encompassing as it does people from many discourses, there is a potential for misunderstanding to arise. To counter this tendency, there is a need to explain the diversity of backgrounds, so as to provide a common base for moving towards a shared understanding (Tsoukas 1996). Failure to surface and
explore this diversity of individual theories of meaning and differences in understandings has been shown to be a major factor in the failure of projects (Tenkasi and Boland 1996). In social systems, knowledge is dispersed: no single mind contains all relevant knowledge, nor can any one mind be aware of what knowledge may be relevant in the future (Tsoukas 1996). One way for a project team to reach a shared understanding is to share knowledge.

In practice, knowledge sharing is not at all straightforward. At the level of capturing “what people know”, knowledge repositories have been conceptualised and designed that facilitate the coding and sharing of best practices, the creation of corporate knowledge directories and the support of knowledge networks (Alavi and Leidner 2001). The majority of these approaches rely on the classic division of explicit and tacit knowledge (Nonaka and Takeuchi 1995), seeking to capture what is explicitly known, or codifying what is seen as implicitly known to individuals. However, this approach fails to recognise that tacit and explicit knowledge are mutually constituted, and cannot be separated: explicit knowledge (what we can articulate) is always grounded in tacit knowledge – our cultural, emotional and cultural background (Polanyi 1998). However, this tacit knowledge can be expressed if we focus on it (Tsoukas 1996), although this should not be taken as the same thing as being able to codify it for the purpose of placing it in some type of automated repository. The ideal solution is to be able to form a repository that encompasses both technology-based storage and retrieval facilities, integrating this with the knowledge of individuals. One attempt at achieving this sought to identify the interests of people based on the documents they accessed (using tacit knowledge) rather than on keywords (which use explicit knowledge): the goal was to identify where interests (and therefore knowledge) resided in an organization (Stenmark 2000).

This marriage of technology and people insofar as knowledge sharing is concerned is reflected in the models used to conceptualise knowledge repositories. The idea that each person has a “directory” of what is known by others, termed transactive memory, is one such model (Wegner 1995). The original model was specifically related to use by teams, but has been extended to larger organizations, and to distributed applications (Anand, Manz and Glick 1998). A technology-based application based on knowledge acquisition, storage and retrieval has been developed to provide organizational memory.
across multiple projects (Stein and Zwass 1995). These models provide a foundation for adopting knowledge repositories (in the widest sense) as a way to share knowledge within IS project teams, and thus support the development of the project discourse.

As described in this section, critical pragmatics as applied to the IS project management domain can provide the grounding for a model of IS project management that satisfies the characteristics revealed by the action research project. Table 5.1 provides a mapping between the characteristics of critical pragmatics discussed in this section and those characteristics required of an IS project management model. Within the table, key concepts are named and highlighted: these concepts will be used in the detailed description of the model that follows in the next section of this chapter. The project constituency refers to the totality of those involved with a project, subject to decisions that are made as part of the boundary critique; the identification of several management teams acknowledges the need for a more inclusive view of project management, especially in regards to relationships with the constituency; knowledge sharing aids the establishment and ongoing maintenance of the project discourse to expose and debate the power relationships that arise from political and economic realities; and the expectations of the constituency represent the articulation of the diversity of views accommodated by the project discourse.

<table>
<thead>
<tr>
<th>Characteristics of a theoretical model as identified by the action research project</th>
<th>Characteristics of a theoretical model grounded in critical pragmatism</th>
</tr>
</thead>
<tbody>
<tr>
<td>The variety of people involved with the project: identifying objectives, establishing success criteria, responsibility for taking action.</td>
<td>The emancipatory view of people: there are a variety of people affected by IS projects beyond developers and users; these people and groups form the <strong>project constituency</strong>.</td>
</tr>
<tr>
<td>Management problems arising from having a separate development team: using overall goals to guide the project, relying on people outside of the team, consistency of data for the measures, the multiplicity of skills needed by a project manager, the existence of a steering committee that managed the project in practice.</td>
<td>The project constituency by definition includes all who are affected by and contribute to the project, and thus are engaged in the sharing of knowledge aimed at producing the best possible outcome for the project. This implies that there may be many <strong>project teams</strong> as part of the constituency.</td>
</tr>
<tr>
<td>A knowledge sharing environment: to act as a co-ordinating environment for the diversity of objectives, to enable an understanding of with whom particular knowledge resides, to act as a focus for conversations regarding the project, to enable consistency across projects.</td>
<td>Explicitly recognising knowledge sharing as a key process between members of the project constituency, thus recognising that no one person is able to possess all of the knowledge required for the project. Knowledge sharing may be realised by some form of knowledge repository.</td>
</tr>
<tr>
<td>The importance of people: in working through issues, as those ultimately affected by the change.</td>
<td>The establishment of a project discourse: a new discourse that is distinct from the discourses of the members of the constituency, explicitly concerned with the need for a shared understanding between members of the project constituency.</td>
</tr>
<tr>
<td>A wider timeframe for projects: some objectives are relevant outside of the traditional begin and end dates of projects, as a mechanism for organisational change.</td>
<td>The exposing of power relationships as part of the project discourse and the commitment to the emancipation of people requires a longer-term view of the effects of change beyond the traditional project dates.</td>
</tr>
<tr>
<td>Objectives as a central theme: a full understanding of the objectives can add real value to a project, in particular when these objectives are used to define useful measures for the project manager.</td>
<td>The project discourse is aimed at empowering all members of the constituency: one key element to reaching understanding is for the expectations of the constituency to be shared.</td>
</tr>
<tr>
<td>The importance of practical prescriptions: to be able to provide guidance for the conduct of particular projects.</td>
<td>The recognition of (especially) political and economic constraints that are manifested in the power relationships exposed as part of the project discourse, the use of boundary critique to establish the project boundaries, and recognising the role of technology in establishing and maintaining the project repository.</td>
</tr>
</tbody>
</table>

Table 5.1: IS Project Management Characteristics and Critical Pragmatics
5.3 A Model of IS Project Management Grounded in Critical Pragmatics

Using the key characteristics of IS project management summarised in Table 5.1 (the project constituency, the project discourse, knowledge sharing, the need for several management teams and the expectations of the constituency), a model illustrating these characteristics is shown in Figure 5.1, hereafter called the CED (Constituency / Expectations / Discourse) Model of IS Project Management. In this model, members of the project constituency are seen as engaging in dialog as part of the project discourse, in order to identify the set of expectations that are acceptable to the constituency. These expectations form the key part of the knowledge shared by members of the constituency, and are managed through an ongoing process of knowledge sharing. The management of the project is through several teams whose members are drawn from the project constituency; possible management teams include the equivalent of the project steering committee (labelled ‘Mgmt’ in Figure 5.1), the team responsible for the tasks associated with any system development required, (labelled Task’ in Figure 5.1) and a team focused on communication coordination within the constituency (labelled ‘Comm Coor’ in Figure 5.1).

Section 2.8 of this dissertation argued for a change in the way IS projects are managed, moving towards a collaborative/social-intervention view that sees users as being equal partners in the systems development process. Section 5.2 in this chapter has taken this argument further, arguing that there is a need to involve others besides users and developers in IS projects. An important part of this argument is that the attitude adopted should be one of emancipatory discourse, where all of those involved participate in the project discourse on an equal footing, and where power relationships are exposed for debate. The term used in this dissertation for those involved in an IS project is the project constituency.

The term ‘constituency’ in an organizational sense is used to provide a convenient label for those people who come together for some purpose: in the context of this dissertation, to participate in a project aimed at creating or modifying an information system in the organization. The term is an extension of the "socio-technical constituency": "... dynamic ensembles of technical and social constituents - machines, instruments, institutions, interest groups - that interact and shape each other in the course of the
creation, production, and diffusion of specific technologies" (Molina 1995, p387). In the context of IS projects and their management, it is the social constituents that are the focus, and who have an explicitly active role: "... it is only the social constituents who are the creators, the drivers, the purposives" (Molina 1995, p388). In the context within which Molina (1995) discusses socio-technical constituencies, the focus is on groups of organizations coming together to develop a specific technology, but he admitted the use of the concepts within an organization, and it is this usage that is appropriate to the present discussion. In the IS project context, the majority of the constituents will be from within the organization, although important constituents exist outside of the organization, including customers, legislators, suppliers, contractors, professional groups and trade unions.

Conventionally, the people identified here as forming the constituency are also called "stakeholders": those individuals or groups of individuals who either have some input into the process or who are affected by it (Majchrzak 1984). This definition of the term ‘stakeholder’ is consistent with the definition of ‘constituent’, however, one alternative definition of “stakeholder” concentrates on information usage. This definition identifies four categories of stakeholders: current information users, potential information users, secondary information users (those who can direct the use of information), and activity relevant stakeholders (those who will be impacted by any change to information usage) (Hemingway and Gough 1999). This definition is somewhat more restrictive: it appears to exclude the developers of systems.

**Figure 5.1: The CED Model of IS Project Management**
For the sake of clarity, the term “constituency” is preferred over “stakeholder” so as to make it clear that all involved with the project are considered, and specifically includes the developers. However, the definitions presented above of both ‘constituent’ and ‘stakeholder’ help to identify the important subgroups in the constituency. Determining the membership of the constituency is a boundary judgment (Ulrich 2001), and the issues relating to this have been discussed in detail in Section 5.2 of this chapter. Exclusion of one or more groups by accident may be able to be addressed during the project (as it becomes clear that affected parties are not part of the current constituency); however, exclusion by design represents a conscious decision to exercise power, albeit for pragmatic reasons.

In the action research project, an identifiable project constituency as defined here was not evident. Reliance was placed on ‘accepted practice’ as defined by the project management group to identify those who should be consulted during the project. This determination of who should be consulted was based on two related groups: those who carried out the project and the business owners. The relationship between these two groups had been established through practice, and from the perspective of the project manager, precluded the inclusion of people other than those nominated by the project owner. This emerged in the survey of current project managers, where the opinion was expressed that reliance was placed on experts from the area affected by the project, rather than the end users (see Appendix H for further details).

Management are important members of the project constituency, and the organization of the constituency and the roles it undertakes have important implications for the organization. One area where this is particularly evident is in the important area of IT and business alignment, and while the development of strategic business plans influences both short-term and long-term alignment (a role for "management sub-constituencies"), shared domain knowledge also affects both short-term and long-term alignment (Reich and Benbasat 2000). It is suggested that one of the more effective ways for senior executives to gain this shared domain knowledge is through active participation and membership of (several) IS project constituencies, where their knowledge can be disseminated to other members of the constituency, and knowledge of the technology and processes is made available to the executives.
In the action research project, the project steering committee included several people from various business units, and a degree of knowledge sharing occurred at these meetings. If these people were involved in several projects (each with their own steering committee) then there is some spread of knowledge between projects. However, the knowledge shared was focused on the management issues related to the project, rather than matters of detail. Practical time constraints limit the extent to which senior staff can be involved in matters of detail; however there is a need for senior staff to attend to matters of detail where these may have an impact on the project outcomes, such as the variety of expectations of members of the constituency. In this case, the concerns (expectations) of the existing call centre staff appeared not to have been considered by the steering committee.

One version of the project constituency is the software development cell (Axtell, Waterson and Clegg 1997), a concept used in manufacturing, whereby all those involved with creating a product are gathered under one organizational unit. In the realm of IS projects, this would involve all of the software and process developers, and the users, as part of one group. However, the notion of the project constituency goes further than this, as it includes not only those directly concerned with the project, but also management and those external to the organization. This difference notwithstanding, from an organizational perspective, gathering those people who are permanently part of the project under one organizational unit is supportive of the project constituency. Another version is the experience factory (Basili, Caldiera and Rombach 1994). In this approach, a group of people (including "experience engineers"), interact with the project team in order to help the project team use past experience as a base for their current endeavours. Viewed as separate from the project team itself, the experience factory, were it to be considered to be part of the project constituency, is consistent with the model proposed here in that it incorporates an experience base, essentially a knowledge repository. Organizationally, this concept is consistent with the project constituency.

In the action research project, “experts” were available to assist the project team (on such matters as project management, environmental requirements and legislation), but these were not seen as part of the project team in the sense described here.
The use of a constituency model has been linked to benefits realisation and risk management. The notion of information systems professionals playing a co-evolutionary role with line managers, users and customers to realise the benefits of a system recognises the changing expectations that emerge during a project (Remenyi and Sherwood-Smith 1998). Responding to changing expectations is one aspect of risk management, another is concerned with how risk is managed. While some models of risk management entail central control over activities, this can conflict with the concept of an autonomous team taking responsibility for their tasks. It has been suggested (Williams 1994) that this apparent dichotomy can be resolved through providing adequate information to the team, clearly defining their responsibilities, and encouraging a climate of negotiation and compromise on issues. This theme of active involvement by the constituents in change processes is supported by Hunton and Beeler (1997), who looked at the effect of different levels of involvement in change projects. They found that the more the users participated in developing the system, the greater their eventual positive behavioural changes. This result supports the implicit idea behind IS project constituencies: the project outcomes are enhanced by having all those affected by the change involved in the project as active members.

In talking about what makes for a successful project, Lidow (1999) identifies five things that need to be in place in order for a project to have a chance of being successful: comprehension, motivation, skills, resources and communication. By definition, the project constituency has a role to play in all five of these requirements. No longer is there a project team and others: the constituency jointly moves towards an understanding of the project aims and final product. This model also provides a convenient framework for understanding what constitutes success for a project. Where the project team is the primary focus, there is a focus on the technical issues to the exclusion of human and organizational issues (Fowler and Walsh 1999). This is essentially an issue of different perspectives: technical teams will focus on what they can control, have responsibility for and are rewarded for. With a change to a focus on the project constituency, the success criteria become broader. This is reflected in a study by Lim and Mohamed (1999) where users were more concerned with overall satisfaction with the delivered system than having it completed on time. At a more fundamental level, this is a question of ownership of the project. Management have a responsibility to manage (that is, ensure that organizational goals are met in an efficient
manner), however, it has been shown that by effectively ceding ownership of a project to those involved (by empowering those impacted by a project to determine how it will be carried out), the project is more likely to be an overall success (Coombs, Doherty and Loan-Clarke 2001).

The first requirement identified by Lidow (1999) is that of comprehension, and this is defined in terms of ensuring that there is an alignment in the understanding that the constituents have about the purpose of the project. More than this, there is a need to improve the alignment, that is, through a process of accommodation via the project discourse, improve the balance of views on the project. The idea of alignment is continued in the second of the five requirements: motivation. This involves aligning personal and organizational goals so that behaviour (especially of the managerial members of the constituency) is in line with the ideas of stewardship theories of behaviour (Davis, Schoorman and Donaldson 1997). In the training arena, the constituency has the role of sharing knowledge about the areas subject to the proposed changes, ideally through a process based on open communication. This need for effective communication becomes particularly evident when relaying information to the varying constituent groups, where targeted communications are needed (Lidow 1999).

*In the action research project, two of the five requirements identified by Lidow were not met as well as they could have been. While the motivation of the project team appears to have been managed well, the issue that emerged related to the current call centre staff supports the view that these members of the (possible) constituency were not especially well disposed towards the project. While it is possible to define the project constituency in terms of a narrow group (excluding those who may have issues), this approach may not be supportive of eventual project success. The second requirement that was not particularly well managed was that of communication. In this case, the narrow definition of the project team meant that those affected by the project (again the current call centre staff) were not able to have a voice in the way the project unfolded.*

An area where the concept of a project constituency is consistent with emerging conceptualisations of information systems is in the idea of the "emergent" organization as opposed to the stable organization (Truex, Baskerville and Klein 1999). Arguably, current organizations are in a constant state of change as they attempt to adapt to
increased competition, globalised markets, and developments in communication technology. As a result of these forces, organizations are never stable, in fact, stability is to be shunned, representing stagnation and eventual extinction. In a similar vein, the information systems that support these emergent organizations have to be adaptive to constant organizational change. This may require a change in the way information systems are developed, in particular the validity of the traditional IS development approaches, including the notion of IT-driven development projects. In these projects, the reality is that "requirements are always in motion, unfrozen, and negotiable" (Truex, Baskerville and Klein 1999, p120) and that a one-off satisfaction of user needs should be replaced by an ongoing (constructive) debate between users and developers as to what the outcomes of the project should be (Truex, Baskerville and Klein 1999, p121). Their conclusion is that an information system should always be in a state of flux as it adapts to changing organizational needs, needs that are rooted in the people in the organization. This position is broadly consistent with the concept of the project constituency and its role in a project proposed in this dissertation, with the caveat that there remains the need to focus the debate between users and developers so as to achieve outcomes in reasonable timeframes. Importantly, the project constituency provides a structured method for handling continually evolving requirements.

The project constituency is the foundation of the CED Model of IS Project Management described in this dissertation. The visible product of the members of the constituency engaging in dialog is the expectations of the project.

In the broad picture of IS projects, the time comes when an assessment is made of the outcomes of a project, which requires some criteria to be established. For an insight into this, it is useful to turn to an analysis of customers and quality. In this context, "customer" is used as representing those who are the recipients of the products of the project, and quality refers to how well the product performs. In traditional management, there is a distinct separation between the organization that produces the product, and those that are the recipients: the customers. Factories are organized to deliver products to customers who are most often outside of the organization and service organizations refer to their clients, who are outside of the organization delivering the services. In IS projects, there is also the notion of customers or clients (the recipients), and these are often considered to be outside of the project team that produces the system.
However, in the project constituency model discussed here, there is by definition no separation of those that produce the product and those that are the recipients. That is, the roles of producer and customer reside within the same social unit. From the viewpoint of IS project management as currently practiced, this is not really a radical step: there has been many studies carried out that advocate increased client (user) involvement in IS projects (see Section 2.2). What is different under the project constituency model is that there is no organizational separation and the notion of the project team being responsible for consulting clients (users) disappears. No organizational separation facilitates involvement in the project. Those that commission the project (for example, strategic managers) are able to promote, explain and support the strategic view of the project. The line departments who will benefit from the project (for example, the logistics department) are directly involved and can ensure that their particular point of view, encompassing issues such as positioning in the supply chain, billing needs and physical location constraints, are included in the project. Those that will use the system (the end users, be they external and internal) will have a voice in the project. In contrast to the traditional management structures surrounding projects, wherein hierarchical constraints and politics can come into play, direct involvement without these boundaries will make the flow of information more efficient, that is, build up the project knowledge repository.

This background of the role of customers / clients / recipients, and its conceptualisation in the project constituency model, provides a context for the development of the expectations of the constituency, which include questions of quality. Simply defined, expectations are the totality of the outcomes desired and anticipated by the project constituency. In the project constituency model, expectations are developed by the constituency, and form their own criteria for judgements relating to the outcomes of the project.

*In the action research project, it appeared that the expectations of the various parties involved were never explicitly articulated, resulting in at least two potentially serious consequences for the project. Firstly, the project manager (by way of the project charter) was focused on the “implementation date” of the new call centre, and his project plans were predicated on this. However, during the application of the initial project management methodology in the first cycle of the action research project,*
additional deliverables were identified (such as long-term training and recruitment plans) in order to achieve sustained benefits. These additional requirements could be traced to unstated expectations of the business owners. Secondly, there were the negative expectations held by the current call centre staff which emerged during the project. Had these concerns (expectations) been identified during the planning stage, actions could have been included in the project plan to address them, possibly reducing the stress experienced by the affected staff.

The identification of the constituents’ expectations in a timely manner is also an important issue related to the outcome of the project. Current IS project management practice is focused on how the project is managed after the go-ahead has been given (usually after a project feasibility report or similar has been produced). In this dissertation, a project is considered to cover the entire time period from first idea to closure. It is within this period that the conventional development project will take place. Therefore, it is inherent in the model that the constituents’ expectations (albeit at a high level) are taken into account at the earliest opportunity. As the project progresses, these expectations will evolve as more constituents are included and as the end product (for example, a new IS) goes through its development phase and into its operational phase. By considering the project to cover this extended period, there is continuity in the development of the expectations and the involvement of the project constituents.

Preproject partnering has been proposed as one way of ensuring that the users’ expectations of the information system are realised, and involves a deliberate strategy to identify and resolve as many potential conflicts as possible before the project commences, that is, negotiating the system expectations (Jiang, Chen and Klein 2002). While this approach is generally consistent with the project constituency model, it has two major differences. Firstly, the view of the project is that it is a technical exercise, as users are involved at the behest of the project manager: ownership still rests with the technical project manager. Secondly, there is an assumption that by undertaking preproject consultation, issues will be identified and corrected; ongoing issues are to be avoided. Both of these differences are contrary to the philosophical foundations of the project constituency model.
Considering the clients / customers / recipients as external to the project team leads to two management views on control of the project: the external view that looks at the product, and the internal view that looks at how the product is produced. These two views can have different imperatives placed on them, as a measure of external acceptance may be the utility of the system, while the measure of internal success may be the budget result. Using both of these types of management measures is facilitated by not having a boundary between external clients and internal management. It is then possible to ask what are the utility measures for the entire constituency, and what are the management measures for the entire constituency. Utility in its simplest sense refers to usefulness of purpose. However, the definition can be extended to include the degree to which it fulfils its purpose, that is, its quality. Older definitions of quality refer to a product meeting requirements, but more contemporary ideas of quality talk about exceeding expectations. While this idea has been applied especially to production and service industries, the idea holds for IS projects. There is no reason why the notion of a project exceeding the expectations of all of the clients / customers / recipients cannot be applied to the product of an IS project. It is then a small step to adopting the notion that exceeding expectations should apply to not only the product, but to how the product is produced, that is, expect the processes used to be subject to quality improvement techniques. In a similar vein, management measures such as budget and time targets can be applied to the entire constituency. This permits operational issues (such as time-of-year constraints) to be included in the measures used for the project. The net effect of this is to broaden the set of results measures to include the results expected by the clients / customers / recipients.

The theme of expectations relates to the outcomes of the system, how it will impact on jobs, how it relates to organization strategy, and so on. The definition includes both positive expectations (improved operating capacity), and negative expectations (loss of jobs). Expectations are the result of cognitive processes whereby individuals integrate their understanding of the project with their own values and beliefs. Therefore the expectations are neither right nor wrong. However, this typically results in incompatible expectations, such as expected savings through staff cuts versus the expectation of enhanced facilities. These possibly conflicting expectations need to be reconciled, and this is the responsibility of the project constituency. In the model developed in this dissertation, the resolution of incompatible expectations is seen as occurring through the
continuation of the project discourse, and reflected in changes in the knowledge repository that is used for sharing understanding. Parenthetically, the same process can be used to assist in the evolution of expectations, such as those that emerge from changing business priorities.

Reconciling possibly conflicting expectations involves dialog, information exchange and reaching accommodations that the entire constituency can live with. It is a process of ongoing discussion, as potentially conflicting expectations will take time to resolve in all but the simplest of projects. The implications of an ongoing dialog over expectations for the project are significant. The main issue is that what the project is to deliver (the product) is likely to change throughout the life of the project. Yet this is the situation facing many IS projects now, although these changes are referred to in terms of changing business requirements. In the project constituency model of expectations, changing business requirements become only one type of source of change. Changes due to organizational issues (such as workplace accommodations) receive equal visibility.

The Project Management Body of Knowledge (PMBOK) (Project Management Institute 2000) explicitly identifies the importance of managing stakeholders' expectations: "The project management team must identify the stakeholders, determine what their needs and expectations are, and then manage and influence those expectations to ensure a successful project." (Project Management Institute 2000, p16). An analysis of this statement of intent against the model presented here highlights several important differences as well as some similarities. Fundamentally, the view of the PMBOK is that the project team is in control, and although this may be seen as the way projects are managed (the management perspective), it also suggests that this is also the cultural view (the organizational perspective). This is quite different from the model presented here, as the theory starts from the proposition that it is the stakeholders who determine what is done under the umbrella of the project: culturally this requires acceptance of a socio-centric view of the organization. From this view comes the second point of disagreement with the model presented here: that the project team somehow changes the stakeholders' expectations to conform to what the project team believes to be the purpose of the project. As one study recommends: "... they [IS staff] should seize the initiative and set user expectations ..." (Ryker, Nath and Henson 1997, p536). Again,
this is a matter of perspective: the CED Model of IS Project Management presented here has the project delivering what the project constituency (including management) agree is the best outcome (through a process of reaching accommodations as part of the project discourse). Both approaches to managing projects recognise the importance of expectations.

In the action research project, the survey that looked at the stage of maturity of the organization with respect to its project management practices revealed that the organization still has some way to go to become a “mature” organization (see Appendix H). In terms of involving all members of the project constituency in a project, rather than separating the project team from the users, it may be necessary for the organization to move more towards the higher levels of maturity before such concepts can become part of the organizational culture. At the time of the survey, there was still an identifiable level of mistrust between the business areas and the project management group.

A judgment as to how successful a project has been can be translated into mapping the extent to which their expectations have been met by the project outcomes (Klein and Jiang 2001, Jiang, Klein and Discenza 2001). However, this mapping requires that there be stated expectations that are developed before the project is completed. Rather than use assessment of user satisfaction as measured by assessing an overall construct ("user satisfaction rating"), it is more informative to use measures against a set of clearly articulated expectations. The point of developing expectations is not to be able to measure satisfaction as an after-the-event activity, but to act as a means of actually meeting their expectations through proactive management of the project. Thus, expectations become the means to an end, and assume an important role in providing the link between the model as described (expectations as abstract statements) and methodologies for practice (expectations as management tools): this is an example of the theory / methodology-in-use / practice loop discussed in detail in Section 3.3 of this dissertation.

In the action research project, the initial project management methodology was based on objectives, and these had an implicit connotation of conventional project outcomes (such as time and budget); the broader concept of expectations was to emerge later,
when it became clear that negative and long-term expectations were important to the overall success of the project. The project manager identified this inclusion of a broader class of project outcomes as providing a sense of “better risk management”.

In deriving a methodology for practitioners from the CED Model of IS Project Management (which is described later in this chapter), use is made of measures as the way to operationalize the model: expectations are translated into a set of measures that can be used to assist in the management of the project. This is important mainly to ensure that expectations are met, but it is also important from the psychological influence goals have on behaviour. If measures derived from expectations become one of the key tools used to manage IS projects, the "ideal" values for these measures become goals for the management team. Framing has long been established as having a considerable influence on behaviour (Baron and Byrne 1991). Framing involves giving people information (intentionally or otherwise) about expected outcomes. As a negative example, leading questions in the courtroom are not allowed as it suggests the answer required. In a positive application, setting goals for IS project managers influences the way they manage and the priorities used in making management decisions (Abdel-Hamid, Sengupta and Sweet 1999). When given goals that explicitly set quality objectives, the project managers aimed for this goal, even at the cost to implicit cost objectives. It is therefore important that appropriate goals be established: goals that reflect the expectations of the project constituency. It is also worth noting that a (possible) multitude of goals is not necessarily a barrier to achievement: specific and difficult goals can lead to higher levels of performance (Locke and Latham 1990).

One of the issues in measuring the general user satisfaction construct is that it is a relative assessment, that is, is relative to the level of expectation (Staples, Wong and Seddon 2002). Thus, if users have a high level of expectations of a system, and the reality fails to reach this high level, they will report being more dissatisfied than if they had more modest expectations with the same delivered system. The actual usefulness of the system is the same in both cases, however the reported satisfaction is different. The solution would appear to be for the users to expect very little from the system, and therefore will report high levels of satisfaction. Of course, this does nothing to assist in the assessment of how well in absolute terms the system has met expectations. What is needed is for the expectations to be realistic in terms of organizational impact,
technological feasibility and overall usefulness-to-purpose. This judgement can only be made if the expectations are informed, that is, are developed as part of the project, and not external to it. This requires an uninhibited flow of information between the project constituents as they come to understand the system and its potential and limitations.

Expectations emerge as a key component in the management of projects. As part of the project discourse, they form a focus for dialog, acting as the expression of the current understanding of the constituency. Early in the project, the expectations are likely to be to some degree internally incompatible: it is an ongoing task to work through these incompatibilities and reach a shared understanding of the way forward for the project. The formal recording of the expectations in the knowledge repository serves as a reference point for the constituency, and provides the basis for management-related resources for the project management team: a set of measures that can be used as day-to-day management aids. In the latter stages of the project, the expectations are the basis for the criteria for judging the success or otherwise of the project.

If the project constituency and expectations are key elements of the CED Model of IS Project Management at the concept level, then the knowledge repository is the key element of the model concerned with using the model in practice. The knowledge repository is conceived as consisting of two parts: the knowledge base, which represents the time-related retention of knowledge, and knowledge management, which represents the processes undertaken to use the knowledge base within the project. Within the constituency, knowledge exists in people, as well as coded in information systems. While technical artefacts can make information that can be coded available to many people, the knowledge that resides in people needs to be made available to others in the constituency. Examples of this type of knowledge in the context of IS projects include knowledge of ways of carrying out tasks relevant to the project.

In the action research project, knowledge related to the meaning of the call centre statistics was primarily located in the business owners – there was no documented information about how to interpret these statistics readily available. This raises the issue of knowledge management within the organization in terms of the accessibility of information such as how to interpret statistical information, and also the potential for
continuity of knowledge between projects. In the host organization, neither of these issues had been considered as part of the overall project management approach.

A project constituency could also be conceived as a community of knowledge. That is, not only is a primary aim of the constituency to expose all of the opinions, views and values of those affected by the project, but to move towards an accommodation of those differing views through a process of dialog within the project discourse. Central to this dialog is knowledge, both the coded knowledge of the organization regarding its rules, policies, systems and relationships, and also the knowledge that resides in people. Throughout the project, new knowledge is co-created by members of the project constituency as they engage in dialog.

By seeing knowledge and its use as central to the concept of a project constituency, the management practices used for the project are likely to move towards the structures adopted by knowledge-based organizations, and away from the structures adopted by traditional organizations (Tissen, Andriessen and Deprez 1998). As characterised by Tissen et al, the knowledge-based organization adopts structures that support the sharing of information, including team-based approaches, support from technology and a central administration whose major role is ensuring that knowledge is shared. However at the centre of the knowledge-based organization is the philosophical commitment to sharing knowledge in the belief that through sharing, all will benefit: “When knowledge is shared in dialogue, the sharer knows it will only get richer: it will be readjusted and supplemented by others. The result is a natural knowledge sharing behavior.” (Tissen, Andriessen and Deprez 1998, p151). Commitment to sharing knowledge becomes a key value of the project constituency.

One of the key activities in a project is that of learning, by both individuals and the organization collectively. “Organization learning is the process by which the organization: (1) detects problems … and (2) determines the solutions” (Kloot 1997), p49). To this can be added the availability of knowledge to assist in both problem detection and the search for solutions, reflected in the four basic constructs of organizational learning: knowledge acquisition, information distribution, information interpretation and organizational memory (Levitt and March 1988, Huber 1991). The first and last of these two constructs can be seen as ongoing elements in knowledge
management: the need to acquire and store new knowledge, and the need to maintain “knowledge reservoirs” (especially those involving people) as the mediator of knowledge transfer (Argote and Ingram 2000).

While a detailed discussion regarding the representation of knowledge in all its forms in some form of knowledge repository is beyond the scope of this dissertation, the view adopted is that there will exist knowledge (however defined) that exists in people’s memory, that either cannot be shared or that the owner of the knowledge does not share because that person is not aware of its importance. In seeking to place this view of knowledge into context for use in the project constituency, the model of group memory termed transactive memory (Wegner 1995) is utilised. This model views group memory as consisting of a set of nodes (the people), each node having unique knowledge, with the members of the group having pointers or indexes of what others know (in the sense of their knowledge domains). In other words, members of the group "know who knows what". This model supports two important interactions between the constituency and the knowledge repository: bringing new knowledge into the constituency and sharing that knowledge. When new knowledge is brought into the constituency, the transactive model posits that this knowledge will be assigned to domain experts, as this is the most effective way of integrating this new knowledge into the knowledge repository (Hollingshead 1998).

*In the action research project, there was an extensive support network in place for the project managers in terms of providing information to them; much of this was based on knowing who has worked on similar projects in the past, or has placed in positions that carry with them certain technical knowledge (such as database design experts). While this appeared to work satisfactorily for the relatively small numbers of people involved (less than twenty project managers and supporting experts), it is not clear whether this would work as well for larger groups, where some assistance in the form of ‘information directories’ may be useful.*

The knowledge repository of the constituency can be considered as involving both an information base, which includes both the technical and people-based knowledge resources, and the processes by which that knowledge is captured, stored and retrieved:
knowledge management. One of the key processes in knowledge management is through dialog around the expectations, occurring within the project discourse.

In the project discourse, there is a common thread that arises from the consideration of the role of people in information systems projects: the idea of *accommodation*, and its enablers, consultation and collaboration. This idea has its roots in how an organization is managed: whether it is viewed from the viewpoint of objectives, strategies, decision-making process and rational people acting with common goals, or from the viewpoint of people working together in order to achieve outcomes that are considered acceptable to all concerned. The term "accommodation" is used to describe the process by which the common understanding and acceptance of the issues is reached. The approach differs from the conventional view of the management process in that there is a concerted effort by all to acknowledge the existence and validity of the different points of view, and seek a way forward that all can live with. Therefore, while the project discourse arises out of the shared understandings of the constituency, the process of accommodation reinforces the goal of moving the project forward.

Constituencies engage in alignment: in the creation, adoption or adaptation of the technical and social factors that underlie the constituency (Molina 1995). This alignment is not a once-only, static event, as the forces that create tension and disharmony may cause the alignment to become a process of realignment, resulting in new accommodations between the constituents. It should be noted that alignment does not necessarily infer consensus: for example, alignment may be enforced through power structures. The definition of accommodation that arises from this is one of a balance of forces existing at any one time, wherein those taking part in the discourse recognise that this balance is appropriate or unavoidable at that time.

Checkland and Holwell (1998) use the term "accommodations" in the sense of handling conflicts in interest of those participating in the dialog, enabling action to be taken. This is consistent with the definition used here: members of the project constituency will have different (and potentially conflicting) views, norms and values about the project, and in order for progress to be made, dialog has to occur in order to find a way forward that all can live with. In the model proposed here, a prime role is given to the constituency to undertake this dialog in order map the path forward for the project.
Just as expectations are the tangible expression of what the constituency wants from the project, the seeking of accommodation through dialog is the tangible process of the project discourse.

In the action research project, addressing the concerns of the current call centre staff required close consultation to work through to a solution that was acceptable to all. While the current staff accepted that their jobs were to be abolished, the opportunity to retrain for other positions and to be supported in their search for alternative employment was seen as an acceptable outcome for all parties. There were three main parties involved in this outcome, each with different (potentially conflicting) objectives. For management, whose objective was to move the call centre while maintaining service levels, recognition was required of the needs of the staff in order to achieve their objectives. On the other hand, the staff were concerned with maintaining their wages, either with the same company or elsewhere, so being provided with the opportunity to retrain and to be provided with the resources to find alternative employment (such as the services of an employment agency) made the transition easier; while their preferred option would be to keep their current position, if this was not to be the case, then the negotiated outcome provided some degree of satisfaction. The project manager, one of whose objectives was to maintain service levels, had a role in (firstly) raising the issue to the attention of management, and (secondly) brokering a suitable outcome. While management certainly had the power to dictate the move, they were not able to impose their decision without consequences, so they had to work with the staff (through the staff associations) to reach a middle ground.

These elements are brought together in the organizational forms used to achieve the desired outcomes of the project, that is, when action is initiated (Lundin and Soderholm 1995). While projects may be undertaken within line divisions as part of day-to-day activities, the more usual form for IS projects is to form a project team. Conventionally, each project team is managed by a project manager, who reports for project purposes to some form of steering committee. In many projects the project manager may have considerable responsibility (such as in building projects), however, in IS projects being run in-house, this is not usually the case, with the authority for such decisions as hiring employees vested in line managers (Sauer, Liu and Johnston 2001). In reality, IS project
managers are ‘task managers’, charged with the responsibility to complete tasks according to agreed plans (which include resource and time constraints).

By definition, management (including senior management) is part of the project constituency; this includes those responsible for decisions such as employing staff, allocating budget and agreeing to changes in dates. With expectations having a key role in the project, and their management important to project success, there is the opportunity for alternative organizational arrangements for the way in which the project is managed. In the model described here, the alternative proposed is to recognise (at least) three distinct management roles: co-ordinating resources and ensuring consistency with the rest of the organization, detailed planning and task supervision, and knowledge management, especially the processes involved in managing the expectations. The first two of these correspond to the conventional steering committee and the project manager respectively, while the third has no parallel in current IS projects.

In the action research project, the ‘project manager’ was more task-oriented than exercising discretion in using resources, being primarily concerned with such things as task assignment, task completion and contract supervision. Matters that required other than minor changes in resources or changes to the project plan were required to be submitted to the steering committee. Thus, for this project, there would be no substantive change to what is actually done.

One of the responsibilities of the person concerned with seeking accommodations from the expectations of the constituency is to facilitate this process, which requires an ability to work with members of the constituency and to continually work towards maintaining good relationships. Research has shown that task-oriented responsibilities are rarely compatible with these skills (Van Der Merwe 2002). A person with specific responsibility for managing the expectations, and, more generally, for managing the knowledge repository, is one solution to this.

5.4 Implications for the Project Management Methodology

The major part of this chapter has described a model for IS project management grounded in critical pragmatics: the CED Model of IS Project Management. This
model describes the key characteristics that have to be fulfilled for the model to be used effectively: the project constituency, expectations as the basis for what the project has to deliver, the seeking of accommodation through dialog, knowledge management realised through a transactive knowledge system, and multiple groups as the basis of how the project is managed. However, in order for this model to be useful in practice, it is necessary that the various parts of the model be developed into a set of methodologies that can be used as guidelines for practitioners. One part of the model is the use of the expectations as the basis for deriving measures that can be used in the day-to-day management of projects.

In Chapter 4 of this dissertation, a measures-based methodology that started from project objectives was used in an action research project. As a consequence of developing the CED Model of IS Project Management described in this chapter (which was itself influenced by the action research project), it is necessary to modify the methodology. This section describes those modifications.

*Expectations as outcomes and consequences*

Expectations represent what the constituency believes, wants or fears that the project will deliver, or will affect their lives. The project constituency needs to manage these expectations so that the evolving set of expectations represents what has been arrived at as representing a way forward at that point in time. Ideally they have been agreed upon, having been co-created and negotiated; however, there may remain unreconciled expectations. Unreconciled expectations represent a risk to the project; the extent that they remain unreconciled may jeopardise the project in either or both the short and long term. While in practice some degree of unmet expectations is unlikely to cause the project to be regarded as a failure, significant unmet expectations may well lead to failure. An inability to agree on the majority of the expectations may be a trigger for a reassessment of the viability of the project. While it may be tempting to invoke management privilege to enforce a particular resolution (that is, enforcing power structures) in order to meet short term goals, unresolved issues may well return to threaten long-term outcomes.

Based on a set of current expectations, tools and techniques are required at the operational level so that objective information from the project can be combined with
subjective judgments to progress the project. Performance measures are proposed as the operational tools used by the project constituency to manage their expectations. Moving from expectations as general statements to a set of specific measures entails several steps. However, before these steps are followed, it is assumed that the expectations have undergone a process of debate within the constituency, that these expectations have been made visible, and that the set of expectations used represents the most accepted expectations. Finally, it should be noted that expectations change over time, so even though the steps to the measures are described here as a linear process, in reality it will be a continuously evolving process. The first step in operationalising expectations is to cast them in the form of outcomes and consequences. In this context, an outcome is an observable or implied change in the environment. For example, it may be an actual product (a computer-based information system), a change to work practices (change in skills used on the job), or improved customer relations (improved response to requests). Outcomes, as derived from expectations, may be positive or negative. Therefore, this step involves identifying the outcome, and identifying whether it is a positive or negative outcome (it could be both), and which of the constituents hold that view.

In the action research project, the change in location of the call centre was seen as an undesirable outcome from the point of view of the current staff. However, there was no avenue for them to communicate this to the project team, the project steering committee or the business owner of the project. As a result, the problem was effectively ignored until it surfaced as an issue during the project.

Related to whether the outcome is seen as positive or negative is the identification of the consequences if the outcome is or is not realised. When members of the project constituency express an expectation, rarely will this be value-free (that is, it does not matter whether the expectation is realised or not). It follows from this that there is an implied consequence if the expectation is or is not realised. For example, an expectation that the project will improve customer response carries with it the implied consequence of lost opportunity to improve competitive position. This step is therefore concerned with identifying the consequences of both achieving and not achieving an outcome (as an outcome can be expressed in either negative terms or positive terms).
In the action research project, the negative expectation of the current call centre staff had two consequences. Firstly, the staff themselves faced the prospect of losing their job, and at a personal level, some responsibility to address this could be seen as a responsibility of the employer. Secondly, if the negative expectation was not addressed, there was the likelihood (as demonstrated by the KPIs) that the public image of the company would be affected.

The purpose of this step is to focus attention on the expectations with a view to incorporating some value judgment as to the relative importance of the expectation when compared to other expectations. The aim of this step is to rank the expectations, either in absolute terms, or in groups. Depending on the success of the dialog surrounding the expectations that should occur as a preliminary step, this first formal step may require some time. It may also result in changes, as members of the constituency come to change their expectations as a result of new knowledge (such as an improved understanding of the consequences of certain expectations).

**Outcomes as objectives**

The outcomes derived from the previous step constitute the objectives for the project, and expressing these objectives in terms of observable behaviour forms the second step of the methodology. At this time, the effort required is targeted at defining as explicitly as possible what is meant by the outcome. For example, an outcome may be expressed as *to enable staff to improve customer service*; this can be expressed as an equivalent objective as *to enable staff to meet industry best practice in the provision of customer service*. The aim of this step is to further clarify the outcomes so as to give the project management team performance levels.

**Posing questions and identifying measures**

The subsequent steps of the methodology are similar to those described in the original version (Appendix G), with one further addition. After the full set of measures has been identified, it is necessary to form a sub-set of measures that will actually be incorporated fully into the project management methods. The identification of the consequences of particular outcomes being or not being realised provides a basis for selecting the measures to be used: a prioritisation is possible. This is similar to the
quantification of risks that forms part of the risk management task for the project, and thus forms a possible link between the measures and risk management.

5.5 Conclusion

This chapter has described in detail a proposed alternative to the conventional approach to IS project management. The CED Model of IS Project Management described is grounded in critical pragmatics, while recognising that the complexity of change occasioned by information systems requires consideration of such issues as who should be part of the project constituency and how tasks are managed. The five main features of the model are the project constituency, the constituents’ expectations, the use of seeking accommodation through dialog as part of the project discourse, the establishment of a knowledge base and the formation of management teams. This model requires that the measures-based methodology used in the action research project be modified, primarily by taking the constituents’ expectations as the starting point for the development of measures. This model, developed through action research, is grounded in the concepts of project constituents and their expectations. Through the expansion of these concepts, and especially through the development of a methodology as detailed in Appendix G, there is clear traceability from foundation concepts to a set of practical prescriptions for use in managing IS projects through to completion.

A sound theoretical basis for the measures-based methodology has now been established, together with a framework for other methodologies (such as how to assemble the project management teams). By being grounded in the CED Model of IS Project Management, the methodology is no longer speculation: there is charted way forward for further development. Therefore, this model represents the foundation for this dissertation.

The next chapter describes the second part of the research study: the use of meta-study to analyse and explain a variety of project failures, using the model as an explanatory framework.
Chapter 6: Meta-Study

6.1 Introduction

The previous chapter described the CED Model of IS Project Management that was developed during the action research project: part 1 of the research study of this dissertation. Part 2 of the research study, described in this chapter, aims to evaluate the model by undertaking a meta-study (described in Section 3.5) based on a number of reports of major IS projects that were considered to be in trouble to some extent (some were cancelled, others implemented to varying degrees). That is, the meta-study aims to answer the research question:

1A. To what extent does this theoretical model of IS project management provide a comprehensive framework for understanding and explaining IS project success and failure?

The next section of this chapter describes the projects that were the subject of the reports, followed by three sections that provides details of the three steps of the research method used – meta-study (as described in Section 3.5 of this dissertation.). The first of these steps is meta-data-analysis, where each report is coded for understanding using a set of categories derived from the literature discussed in Chapter 2; the second step is meta-theory, which involves drawing out common themes from the data (i.e., developing tentative theories about the data); the third step is meta-synthesis, which involves using the CED Model of IS Project Management to understand the themes.

6.2 The Projects That Were Analysed

The projects that were analysed were ten government projects, where an independent body, most commonly the relevant national or state audit authority, prepared the report used as the basis for the analysis. The projects are summarised in Table 6.1. The reports cover systems that commenced development in the late 1980s through to 2001, with the majority being undertaken in the 1990s. There are five US projects, three UK projects
and two Australian projects. The references represent the publicly available reports on the investigations; they are all readily available on the World Wide Web.

<table>
<thead>
<tr>
<th>System</th>
<th>Year(s) of System Reported On</th>
<th>References</th>
</tr>
</thead>
</table>

Table 6.1: The Projects Reviewed in the Meta-Study
A brief description of each project (including key findings) and the motivation for the investigation follows.

**Food and Drug Administration Import Automation (US)**

The project began in 1987 to develop an information system to support the import and entry clearance processes of foods, drugs, cosmetics, biological products, medical devices and electronic products in order to protect the public against threats to public health. After eight years of development and the expenditure of an estimated $US13.8 million, the system is not ready for use. The primary reasons identified include inadequate senior management oversight, inadequate project management skills and inappropriate system development practices (United States General Accounting Office 1995). A re-engineering effort, combined with improved management practices, was seen as mandatory for completing the system.

**California Department of Motor Vehicles Database Redevelopment (US)**

The system was another attempt to replace a number of legacy systems, with particular focus on modernising the database design, prompted by forecast volume increases and legislative mandates. Many deficiencies in the way the project was conducted were identified (State Auditor of California 1994), including unreported (to the State legislature) costs, and a falsified purchase order. The types of practices identified included progressing to subsequent stages of development even though major issues at previous stages had not been addressed (including performance issues), failure of the supposedly independent Office of Information Technology to insist on project milestones being met before additional funding was made available, and inadequate sub-contractor practices. The project was abandoned after seven years, with a total loss of $US49 million.

**The Australian Diplomatic Network (Aust)**

This system was designed to provide secure and reliable communications for the Australian Diplomatic Service between its domestic offices and overseas posts. Between 1989 and 1997, $AUS101.9 million had been spent on the project. While the overall assessment of both the Department of Foreign Affairs and Trade (the users) and
the Audit Office (Auditor General 1998) is that the project has generally achieved its outcomes, some project management practices were criticised, especially in light of a five-year delay in completion. The major conclusion was that major elements of the project management and project governance arrangements were not operating effectively during the middle stages of the project. Other areas that were identified as requiring attention included risk management, quality control and financial control.

_Bureau of Land Management Automated Land and Mineral Record System (US)_

After fifteen years of development and at a cost of some $US411 million, the major software component of the system designed to provide an information system to support land management functions (such as processing applications for gas and mineral leases) failed. At the time of the report into the system in 1999 (United States General Accounting Office 1999), the system had not been implemented. Criticisms levelled at the system include the conclusion that the system did not support the Bureau’s business activities, that it was too complex, and that it actually significantly impeded worker productivity (for example, recording a $10 sale under the legacy system took ten minutes; under the new system, it took an hour). Reasons for the failure of the project include poor project management practices, lack of a system architecture, lack of transition, operations and maintenance plans and inadequate testing regimes.

_London Ambulance Service (UK)_

In the history of failed IS projects, this one is often presented as one of the most disastrous, as it was claimed (although not fully substantiated) that lives were lost as a result of the project (South West Thames Regional Health Authority 1993). The system (which involved automatic allocation of ambulances to calls based on the current location as determined by a radio location sub-system) went live on 26 October 1992. In the first few days of operation, the system did what it was designed to do, but on the 4 November 1992, the primary system failed, and the backup system failed to respond. The system was eventually replaced by another, more modest system. Many issues were identified as contributing to the failure of the project, with two of the primary ones being failures related to the management of the project (in terms of lack of testing and inappropriate contractors), and poor relationships between the project team and the ambulance staff.
Health and Welfare Agency Statewide Automated Child Support System (US)

In terms of monetary losses, this project stands out due to its development being linked to US Federal funding initiatives. The US Federal Government required the states to implement state-based systems for child support, including the payment of funds and the enforcement of court orders. The legislation was passed in 1988, and required that every state have a certified system operational by 1995; failure to meet this deadline could result in financial penalties on the states. The report into the Californian system (California State Auditor 1998) identified a “cascade of events” that, taken together, caused the project to fail. The contributing events identified included the requirement that existing systems be modified rather than that a new system be built, final requirements from the Federal Government took five years to be finalised, the project was deadline driven rather than results driven, the contractor did not provide the promised project team and developed a flawed system design, testing was inadequate and problems were not addressed as they arose. The system was classed as “dysfunctional” and did not meet the Federal certification requirements. Direct costs were estimated to exceed $US111 million, ongoing costs estimated to be $US11 million, with the prospect of Federal penalties of $US144 million over four years.

National Probation Service System (UK)

The goal was to implement a national information system that would enable sharing of information on probationers, yet at the same time cater for regional differences. The key findings of the report (Comptroller and Auditor General 2001) were that although significant progress had been made towards establishing the communications infrastructure, the system was difficult to use and did not reflect the changing business requirements, that the cost was likely to be in the order of £118 million by 2001, some 70% above forecasts, and that the support given to implement the system was inadequate. Recommendations for the future include a closer link to business strategy, attention to organizational implications of the system and tighter control over contract arrangements.
Coast Guard Marine Information for Safety and Law Enforcement System (US)

Designed to replace an aging legacy system that tracked safety and law enforcement actions (such as drug-related activities and oil spills), the new system faced considerable problems related to cost and schedule when the report was prepared (United States General Accounting Office 2001). At that time, after some six years in development, approximately 85% of the budget ($US61 million) had been expended but only limited capabilities were ready to be deployed. The particular risks identified included changing system requirements, the system testing regime used, transition planning and overall risk management.

Financial Management Information Systems (Aust)

In 1995, the Australian government initiated a project to select a financial management package that would form one application in its Shared Systems Suite Initiative, part of a strategy to reduce the number of different administrative systems in use by government agencies. Following a Request for Proposal in early 1996, six financial management information systems (FMIS) were selected as fulfilling the requirements. The Australian National Audit Office (ANAO) commenced a study in November 1999 to assess the experiences of the agencies in acquiring FMIS. The cost of the systems acquired under the FMIS guidelines was estimated to have exceeded $AUS100 million (which excludes some then not yet implemented systems), compared to a Department of Finance estimated cost of $AUS93 million. Of those agencies that had completed implementation of their FMIS, 68% reported positive outcomes. The ANAO found that the majority of agencies experienced difficulty with implementing their chosen system, and that few agencies selected an FMIS that was both appropriate to their size or complexity and then proceeded to effectively implement the system. Major factors identified as contributing to the identified problems include the planning and conduct of the selection process, failure to adequately identify the business needs and poor implementation planning.

Department of Social Security Benefits Payment Card Project (UK)

By 1999, the benefits payment card was intended to replace paper-based methods of paying social security benefits and to automate the national network of post offices
through which most benefits were paid. The initial contract was awarded in 1996, and a limited version of the system was operational later that year (ten post offices in one county for the payment of child benefits). The next stage was a live trial that was to involve 24 different benefits and all of the 19,000 post offices then in operation: this had not been achieved by the time the contract was cancelled after three years. After a number of independent assessments, it was concluded that the project could succeed, but three years later than planned, at an unknown cost. In 1999 the benefits card was removed from the project: payments of benefits to beneficiaries would be made instead by automatic transfers to nominated bank accounts. The main reasons identified for the failure of the project include (Comptroller and Auditor General 2000): divided control by two organizations with different objectives, inadequate time for specifying requirements and piloting, and inadequate risk management.

Summary

From these brief descriptions, it is evident that the reasons for project failure are both varied and complex: varied in that issues arise from management, technical and political arenas, and complex in that there is unlikely to be only one major reason for failure. Yet there appears to be a common thread through many of these projects: the project management practices that were adopted emerge as being inadequate. While large IS projects were possibly novel in the 1970s, the same was not true by 2000. However government has found learning from and applying its previous experience in project management very difficult. And the government is not alone in encountering problems with such projects.

(Comptroller and Auditor General 2000, p12)

Given the potential impacts of systems such as those described here, the failure of these projects involves a social and human cost, in addition to the normally quoted financial cost. This part of the research reported in this dissertation aims to identify the common threads in these projects and use them to evaluate the CED Model of IS Project Management described in the previous chapter: this may be one step towards learning from past mistakes.

Note: In the remainder of this chapter, references in bold square braces, e.g., [5], refer to the documents as listed in Table 6.1. Due to the format of the original documents, it
was not possible to directly import documents into NVivo, therefore proxy document coding was carried out, with coded text scanned as required.

6.3 Meta-Data-Analysis: Making Sense of the Reports

The categories used for the preliminary coding were derived from the range of success factors that were discussed in Chapter 2, with the process used described in detail in Section 3.5. From this process, a total of seventeen initial coding categories were identified. These are listed in Table 6.2, together with the corresponding concepts identified in previous studies (Barki, Rivard and Talbot 1993, Yetton, Martin, Sharma et al. 2000, Schmidt, Lyytinen, Keil et al. 2001). Some of the initial coding categories relate directly to concepts in the related studies – for example, number 8, inadequate resources, was identified in all of the related studies as an important risk factor. Others subsumed several concepts into a more abstract one – for example, number 12, user expectations, covers concepts referred to as the attitudes of users (Barki, Rivard and Talbot 1993), users feeling threatened and being resistant (Yetton, Martin, Sharma et al. 2000), and lack of cooperation and commitment (Schmidt, Lyytinen, Keil et al. 2001).

The ten reports were then coded, using the seventeen initial categories as the basis for the first-level analysis. As this process is highly interpretive in nature, changes to the set of coding categories were expected as the meanings of the texts were identified. The final set of categories used in the first-order analysis is shown in Figure 6.1. Of the seventeen initial categories, one, people-related management, did not have any passages of text associated with it. As shown in Figure 6.1, an additional major category, implementation issues, was added as this theme emerged as a key concept during analysis. Whereas the initial set was framed as essentially negative factors (for example, inappropriate technical objectives), as the underlying concepts were understood from the texts, renaming became necessary to recognise that the reports discussed both aspects of a particular category, positive as well as negative. By the end of the first-level coding, thirty-three coding categories assembled into five major categories were used to interpret the reports. Full details of the categories used are contained in Appendix I.

Due to the variety of length and the degree of repetition in the reports, the number of passages coded is not a reliable indicator of the importance of the issues raised in the
reports. Two measures that do reveal significant outcomes are the number of distinct categories used to code a document and the number of categories that were coded in all documents. Documents [5], [6] and [7] required the largest number of categories (31, 27 and 27 respectively) in their coding, indicating that these reports were of systems that experienced a wide range of issues. The categories oversight of budget, risk management and project management were coded for all ten documents, indicating that these three issues were involved in all of the systems reported on. Appendix K contains a full numerical analysis of the first-order coding.

In the remainder of this section, each of the major categories used in the first-order coding is discussed as a separate sub-section, with significant outcomes identified and illustrated with text fragments from the documents.

Major category: Strategic

This major category, with its five coding-level categories, involved the least number of documents, with an average of 3.2 documents per coding-level category, with the maximum being 5 documents per coding-level category for communication of objectives. Inadequate communication of intent occurred both within projects:

Most agencies established an FMIS steering committee (which was comprised of a representative group from the senior management of the agency) to guide and support the FMIS replacement project. However, these committees were not provided with adequate information during either the project initiation or implementation stages, which limited the effectiveness of their decision-making and involvement in the selection and implementation processes. ([9], p32).

and where more than one agency was involved as project owner:

The objectives of the Department of Social Security and Post Office Counters Ltd in undertaking the project were different, reflecting their different business drivers. They rightly agreed a memorandum of understanding between themselves before signing the contract with Pathway, which addressed their commercial relationship. But this did not prevent later disputes on matters of detail. For example, arrangements that the Department wanted to ensure security for payments to people temporarily collecting benefits on behalf of claimants proved difficult to balance against Post Office Counters Ltd’s commercial interests in maximising the flow of customers through its outlets. ([10], p6).
### Derivation of Initial Risk Factors for Document Coding From Related Studies

<table>
<thead>
<tr>
<th>Related concepts identified in other studies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baski, Rivard and Talbot (1993)</td>
</tr>
<tr>
<td>Yettin, Martin, Sharma et al. (2000)</td>
</tr>
<tr>
<td>Schmidt, Lytinen, Kell et al. (2001)</td>
</tr>
</tbody>
</table>

#### Table 6.2: Derivation of the Initial Coding Categories

<table>
<thead>
<tr>
<th>Major Category</th>
<th>Coding Category</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Strategic</strong></td>
<td>Task - inability to characterize</td>
</tr>
<tr>
<td>1</td>
<td>Project not well defined</td>
</tr>
<tr>
<td>2</td>
<td>Strategic nature</td>
</tr>
<tr>
<td>3</td>
<td>Unclear benefits and business needs</td>
</tr>
<tr>
<td>4</td>
<td>Communication of objectives</td>
</tr>
<tr>
<td>5</td>
<td>Changing scope and objectives</td>
</tr>
<tr>
<td>6</td>
<td>Lack of commitment, control</td>
</tr>
<tr>
<td>7</td>
<td>Size of project</td>
</tr>
<tr>
<td>8</td>
<td>Urgency</td>
</tr>
<tr>
<td>9</td>
<td>Artificial deadlines</td>
</tr>
<tr>
<td><strong>Technical</strong></td>
<td>Technical complexity</td>
</tr>
<tr>
<td>10</td>
<td>Perceived complexity</td>
</tr>
<tr>
<td>11</td>
<td>Unproven technical feasibility</td>
</tr>
<tr>
<td>12</td>
<td>Introducing new technology</td>
</tr>
<tr>
<td>13</td>
<td>Lack of knowledge</td>
</tr>
<tr>
<td>14</td>
<td>Lack of methodology</td>
</tr>
<tr>
<td>15</td>
<td>Lack of frozen requirements</td>
</tr>
<tr>
<td>16</td>
<td>Misunderstanding requirements</td>
</tr>
<tr>
<td>17</td>
<td>Unfamiliar subject matter</td>
</tr>
<tr>
<td><strong>External management</strong></td>
<td>Resource sufficiency</td>
</tr>
<tr>
<td>18</td>
<td>Inadequate resources</td>
</tr>
<tr>
<td>19</td>
<td>Inappropriate resource</td>
</tr>
<tr>
<td>20</td>
<td>Unfamiliar subject matter</td>
</tr>
<tr>
<td>21</td>
<td>Inappropriate staffing</td>
</tr>
<tr>
<td>22</td>
<td>Change in management</td>
</tr>
<tr>
<td><strong>User-related issues</strong></td>
<td>External supplier issues</td>
</tr>
<tr>
<td>23</td>
<td>Conflict between team, sponsor and users</td>
</tr>
<tr>
<td>24</td>
<td>Multi-vendor complexities</td>
</tr>
<tr>
<td>25</td>
<td>Number of users</td>
</tr>
<tr>
<td>26</td>
<td>Number of organizational units involved</td>
</tr>
<tr>
<td>27</td>
<td>Conflicts between users</td>
</tr>
<tr>
<td>28</td>
<td>Conflicts between users</td>
</tr>
<tr>
<td>29</td>
<td>User commitment and expectations</td>
</tr>
<tr>
<td>30</td>
<td>Lack of cooperation from users</td>
</tr>
<tr>
<td>31</td>
<td>Lack of user involvement</td>
</tr>
<tr>
<td><strong>Team management</strong></td>
<td>Team size</td>
</tr>
<tr>
<td>32</td>
<td>Staff turnover</td>
</tr>
<tr>
<td>33</td>
<td>Lack of PM skills, incl people management</td>
</tr>
<tr>
<td>34</td>
<td>Lack of PM methodology</td>
</tr>
<tr>
<td>35</td>
<td>Change not managed, unclear roles</td>
</tr>
<tr>
<td>36</td>
<td>Experience of team leader</td>
</tr>
<tr>
<td>37</td>
<td>Realistic plans</td>
</tr>
</tbody>
</table>

This table outlines various risk factors derived from related studies, categorized into strategic, technical, and external management issues, and user-related and team management concerns.
Figure 6.1: Categories for First-Order Coding
It is evident from these examples that efforts were made to set up appropriate agreements and steering groups, but subsequent events and issues resulted in outcomes that were less than optimal. However, as coded under the *strategic intent* category, sometimes there was never a business-focused statement of what was to be achieved, as illustrated by the senior management of California’s Department of Social Services:

> In its rush to develop a single, statewide automated child support enforcement system, Social Services began working on the SACSS project without establishing measurable goals and objectives. ... Because it did not create measurable goals such as increasing collections from absent parents, or reducing labor costs for child support enforcement, Social Services became involved in automating primarily to comply with federal regulations. ([6], p40)

In comparison to other major categories, strategic management issues did not emerge as significant factors in project outcomes.

*Major category: Technical*

An average of 4.4 documents per coding-level category were coded, with *ISD skills* (7 documents) and *system design* and *testing* (5 documents each) emerging as the categories with significant issues. The coding category *ISD skills* refers to an identified lack of system development skills within the project team that had an impact on the eventual outcome of the project. In some cases this was across the board, including the management of the project, as in the Department of Food and Drug Administration:

> ORA administered the day-to-day management of the OASIS project. We found, however, that ORA did not have the systems development expertise in-house to perform these functions. Our review of the experience and qualification statements of OASIS project management showed that the ORA Deputy Associate Commissioner - the senior project official, the project manager, and the project officer did not have any systems development training or experience. The OASIS project manager concurred with our findings in a February 1995 memorandum, which stated that ORA did not have employees with a adequate knowledge and experience in life-cycle methodology and related skills, all of which were important to a system of OASIS’ complexity. ([1], p14)

Such lack of skill in ISD was not confined to permanent staff; it also applied to contractors engaged for their specific expertise in systems development, as was the case at the California Department of Social Services:

> During its creation of the general and detailed system designs for SACSS, Lockheed did not always fulfill its promises to follow standard methodologies for producing software. ... our review of numerous reports dealing with the SACSS project
revealed that Lockheed did not always draw upon its extensive experience and follow the standard software development methodologies it proposed. ([6], p12).

Nor was it confined to a particular country, as the UK National Probation Service found:

The consultant’s report, in January 2000, identified a badly under-resourced Information Services capability with misaligned skills, and hence an under-performing information services function which was exposing the Home Office and probation services to some significant business risks. ([7], p24).

Related to the skills of the project team, but identified as a separate category, systems design explicitly recognises the impact of the design processes on project outcomes. For example, the Bureau of Land Management

did not develop a system architecture or formulate a concept of operations before designing and developing the ALMRS/Modernization. ... Designing and developing the project without a system architecture and concept of operations unnecessarily increased the risk that the ALMRS/Modernization would not meet the business and information needs of the bureau. ([4], p11)

This was identified after the project had failed (not implemented). However, some projects had evidence during the project that there were technical deficiencies. The California Department of Social Services had hired a recognised contractor, yet

Lockheed developed a flawed system design. The general and detailed system design documents, the “blueprints” for SACS/S, contained numerous identified flaws and deviations from system requirements. These problems were documented by Social Services and its QA contractor and acknowledged in writing by Lockheed early in the project. However, despite the fact that these issues were identified, documented, and discussed as far back as 1993, many of these problems remain unresolved today. ([6], p3)

In the case of the London Ambulance Service, the deficiencies in system design did not become apparent until after the system went “live”:

On 26 and 27 October 1992 the computer system itself did not fail in a technical sense. Response times did on occasions become unacceptable, but overall the system did what it had been designed to do. However, much of the design had fatal flaws that would, and did, cumulatively lead to all of the symptoms of systems failure. ([5], p6)

The majority (if not all) of systems development methodologies stress the importance of testing, so it would be expected that testing regimes would reveal inadequacies in the system as developed. Unfortunately, as the examples in the testing category show, this was not necessarily the case. The Food and Drug Administration
did not conduct user acceptance testing. The self-assessment report stated that FDA did not have written acceptance criteria or test plans. ([1], p16)

In some cases, the testing plans were present, but deficient. The US Coast Guard was assessed as having

undertaken risky testing practices: Key VDS functions were not tested during functional testing because they were under development at the time and were deferred to integration testing. For example: system security, processing and printing Abstracts of Titles, printing Certificates of Documentation. Significant problems were not closed before the next stage of testing began. For example: critical problems identified during MSN integration testing were not closed before system testing began. USCG’s testing practices increase the risk that MISLE will not perform as expected, or may take longer to develop than expected. ([8], p33)

Even when testing was carried out, the results were not always acted upon. The California Department of Social Services contractor’s

computer program also failed user acceptance testing. ... The State changed its plan for user acceptance testing because the SACSS project was behind schedule and because the computer system displayed problems during system testing. ... the QA contractor evaluated the results of user acceptance testing and reported 44 unresolved critical defects in SACSS. The QA contractor also reported that many defects encountered during user acceptance testing resulted from defects in the system that should have been uncovered during system testing. Moreover, the QA contractor commented that the large number of defects encountered during testing negatively affected testing progress, the reliability of test results, and the ability of the test team to satisfactorily evaluate the integrity of SACSS as a usable child support enforcement tool. ([6], p20)

Overall, the issues relating to technical reasons for the failure of the projects reported on have more to do with the practices of management than failures attributable to development methodology or the technological platforms used. The authors of the reports did not identify issues related to methodologies or technology per se, but rather with how they were applied in particular cases, with particular reference to the skills and management practices exhibited in that application.

Major category: External management

Within this major category, two coding-level categories were coded for all ten reports used: oversight of budget and risk management. Two other coding-level categories, quality management (with seven reports coded) and contract management (six reports coded) were the other significant categories. Overall, the average number of documents coded under this major category was 5.7.
In respect of budgetary process associated with projects, two aspects of managing the project budget were apparent: failure to establish appropriate estimates and methods for monitoring those estimates, and failure to exercise appropriate financial management once the project was underway. For the Food and Drug Administration

No cost-benefit analysis [was] conducted. At the beginning of our review, we learned that no one had performed a cost-benefit analysis for the OASIS project. ... ORA officials told us that they did not ask for such an analysis in the past. ([1], p17)

and consequently

We found that FDA has not been effective in controlling costs or monitoring the progress of OASIS. FDA officials informed us that they did not have a cost accounting system that would enable them to clearly identify the costs of the OASIS project. ([1], p15)

In other cases, the budgets prepared were incomplete, leading to incorrect costs being reported:

Some agencies did not budget for the implementation of the new FMIS. Most agencies did not fully budget for the implementation of the new FMIS as they did not recognise the cost of internal resources, consultants or hardware. As a result agencies under-estimated implementation costs, and did not adequately review or revise budgets to reflect the full cost as the project progressed. ([9], p35)

The ramifications of this were significant. The California Department of Motor Vehicles failed to correctly report to the government, because they

did not use a formal cost-reporting system to monitor expenditures related to the DBR project. The DMV's actual and obligated costs for the project were at least $49.4 million, which is $5.1 million more than the $44.3 million in project costs that the DMV originally reported to the Legislature and the Department of Finance. ([2], pS2)

The problems that arose from this were compounded due to severe budget overruns:

The DMV prepared another report in October 1992 that also indicated the DMV was experiencing major problems with the project. At this time, the DMV increased the estimated development costs from $38.3 million to $57.3 million and extended the estimated completion date from July 1995 to December 1998. Among its reasons for the increases, the DMV reported that it had underestimated the scope of the project, the system architecture design took much longer than planned to complete, and the development process proved to be more complex than expected. ... According to the DMV's former chief of EDP Service, the project's management felt that it could eventually overcome the technical problems. Therefore, the DMV's management saw no reason to halt the project. ([2], p21)
Yet not all problems were due to inappropriate decisions grounded in technical issues (such as those listed in the above quotation). Financial pressures from external sources were also responsible for poor financial decisions that affected the project, such as the California Department of Social Services system described above under strategic major category, where the penalties that would be imposed by the Federal Government for failing to implement a system became the main concern of management ([9], p32).

Risk management was another issue that arose in all of the reports. In some cases, risk assessments were conducted late:

A detailed project risk assessment report was not undertaken until 15 months after the project commenced. DFAT did not ensure that project risks were regularly and formally reassessed throughout the project. This was true also for Release 3 which, as noted earlier, is essential to completion of the project, and which has been subject to substantial delay. The consequences of such a delay need to be addressed. ([3], p xv)

or were not thorough:

The purchasers' joint procurement team made strenuous efforts to identify the risks of the project. In March 1995 they compiled a register comprising 224 risks, including virtually all those that could have been foreseen and those that eventually impeded the delivery of the project. However, this register did not include assessments of each risk's probability and impact, nor did it allocate risks to "owners" for management, or propose options to manage the risks. We found no evidence that this formal register was subsequently further developed and actively used in the project, though some of the risks it contained were identified again in subsequent registers later in the project. ([10], p7)

Ultimately, several of the projects failed as problems that were occurring were not recognised as endangering the project, as was the case for the London Ambulance Service:

Senior management, the project team, and the lead supplier had full commitment to the project and continually gave it their best efforts. However, they failed to identify or to recognise the significance of the many problems that were ultimately to cause it to fail. ([5], p5)

Failure to manage the quality of the project processes and deliverables was also a common issue, especially from the point of view of undertaking an independent quality assessment (QA). This was clearly the case at the Department of Foreign Affairs and Trade:
In the ANAO's view, the nature and technical complexity of the project warranted independent quality assurance (QA) arrangements for stakeholder assurance. DFAT has commented that there is no fundamental requirement in the Commonwealth for independent QA checks. It did not implement independent QA arrangements, relying instead on the project manager’s assessment and, through him, on the quality assurance work performed by the Prime Systems Integrator (PSI). In the ANAO's view, industry quality standards and better practice have recognised for some time that independent quality assurance is a key component in effective software development. ([3], pxvi)

In contrast, the California Department of Social Services engaged contractors to provide the required QA, and then ignored the outcomes of the process:

State did not adequately resolve problems. The State paid its QA contractors $3 million to help oversee Lockheed's work and to ensure the State was getting what it paid for. However, despite the contractors' repeated warnings of deficiencies with Lockheed's staffing, development practices, testing procedures, and with the system, Social Services and the data center failed to take adequate action and continued their efforts to install SACSS. ([6], p34)

In the end, lack of attention to quality issues resulted in users not using parts of the system, as was the case with the UK National Probation System:

Some services we contacted had persevered with CRAMS despite the concerns about its quality, ... The Home Office found in March 2000 that 32 services reported that the CRAMS case index was crucial to their work, although most did not use five of the specific functional modules in CRAMS because they did not work properly or did not meet services’ needs. ([7], p17)

This major category was the most-often coded category, both in terms of the average number of documents coded per coding level category (5.7) and in the number of coding categories (11, more than twice the number of any other major category). What clearly emerges from this major category is that it is the management practices associated with IS projects that has the most profound impact on project outcomes.

**Major category: User-related issues**

With an average of 3.8 documents coded per coding-level category, this major category ranks third by this measure, with user expectations (6 documents) and user involvement (5 documents) the two significant coding-level categories. The importance of working with users is reflected in the experience of the London Ambulance Service:

There was incomplete "ownership" of the system by the majority of its users. The many problems identified with many of the system components over the preceding
months had instilled an atmosphere of system distrust in which staff expected the system to fail rather than willing it to succeed. ([5], p5)

possibly resulting from management practices such as

LAS management constantly attributed CAD problems to wilful misuse of the system by some ambulance crews. There is no direct evidence of this, but the circumstantial evidence that does exist indicates to the Inquiry Team that it would have been only one of the many contributory factors that led to the CAD failure. ([5], p6)

This can be contrasted to the Department of Foreign Affairs and Trade, where despite a considerable delay in implementing a release:

ADCNET is now used extensively in DFAT and several other Government Agencies (for example, AusAID, the Departments of the Prime Minister and Cabinet and Defence, and the Office of National Assessments). Feedback has indicated user acceptance of ADCNET following implementation. It has improved the efficiency of work practices and processes at overseas posts, resulting in a faster, more functional and more reliable communications network. ([3], pxiv)

Securing involvement from users was seen by some projects as important, and management took explicit steps to try to ensure that this happened. However, formal committees and the like did not provide sufficient avenues for involvement, as the National Probation Service found:

The overall IT strategy recognised that clear ownership and commitment to NPSISS and CRAMS from all probation services would be essential for the full benefits of the strategy to be realised. The Information Strategy Steering Committee, ... had representation from chief probation officers and probation committees. ... Outside the formal committees there were no other mechanisms for securing acceptance to the management of the program by all probation services. ([7], p19)

Perhaps the ultimate lack of user involvement is reflected by the Food and Drug Administration:

[The FDA] did not conduct user acceptance testing. ([1], p16)

Managing the interaction between users and the project team emerged as an important major category, with the extent to which users are involved and gain a sense of ownership being reflected in their attitude towards and support of the system.
Major category: Team management

While overall the average number of documents coded per coding-level category was 3.5, by far the most significant contributor to this was the coding-level category of project management, with all ten documents being coded. This coding-level category refers to project management practices within the project team (management of the project outside of the team, for example, by senior management, is covered by the major category of external management). The issues that were identified relating to the internal management of the project can be grouped into four general areas: the relationship of the project team to external management, project management skills, planning processes and continuity of knowledge.

Establishing the relationship between external management and the project team requires the identification of roles, responsibilities and reporting requirements, as the Department of Foreign Affairs and Trade failed to do:

> Project management roles and responsibilities were not always clearly defined, and were not consistently applied throughout the project. For example, DFAT did not formally document the project management structure or processes in an ADCNET project management plan to ensure that all concerned were aware and attuned to their particular roles and responsibilities. ([3], p xv)

An omission such as this can then result in inadequate communication with external management, as happened in the Financial Management Information System project:

> Regular project meetings were held by most agencies. However, such meetings tended to have a limited focus and did not adequately address budgets or costs. There was limited evidence of project teams reporting to senior management or receiving guidance from senior management. ([9], p34)

A lack of experienced project managers was an issue in many projects, compounded by staff turnover. Strategies adopted to overcome this problem were generally not explored in detail in the reports, however the agencies involved in the Financial Management Information System project adopted a variety of approaches:

> Most agencies experienced difficulty accessing appropriately skilled project managers from within the agency. To address this problem some agencies appointed external project managers for the implementation, while some of the other agencies appointed internal project managers with some of the required skills set. The audit found that agencies which appointed internal staff with financial management skills generally had more successful outcomes. ([9], p33)
What did emerge from the reports was that the execution of the projects was inadequate, both at the tactical level of overall project objectives, illustrated by the California Department of Motor Vehicles:

Initially, the DMV established a meaningful set of development objectives for an operational assessment and working model of the project. Each of these objectives was supposed to be accomplished before proceeding with the project and incurring additional expenses. However, the DMV continued to develop the system and incur expenses without first solving technical and performance problems that arose. ([2], p52),

and at the operational level of task management, such as occurred at the Bureau of Land Management:

BLM has never had a credible project schedule, reliable milestones, or a critical path to manage the development and deployment of the ALMRS/Modernization. As a result, BLM has not known with any certainty how long it would take and, therefore, how much it would cost to complete the ALMRS/Modernization. Because BLM has not implemented our recommendation to establish a credible project schedule, the ALMRS/Modernization has been driven by self-imposed deadlines. In trying to meet those deadlines, BLM has deferred some tasks until after completion of the project, and has not corrected all problems when it found them because doing so would cause it to miss the self-imposed project deadlines. ([4], p11)

Finally, the problems were compounded in some cases by a lack of project documentation that would enable transfer of knowledge when some staff left and others joined, as occurred at the California Department of Social Services:

Because Social Services did not establish several key processes essential for storing and maintaining important project information and documents during the planning stages of the project, it lost critical documents and project information. ... Specifically, Social Services and the data center did not establish a central library, a process for tracking and monitoring contractor deliverables provided by Lockheed, or a process for transferring project knowledge and decisions between departing and arriving project staff. ([6], p41)

A clear message emerges from these issues raised in the reports, and is present to some extent (usually significant) in all of the reports: the management of the project was a major factor in the outcomes, with a variety of different, though related, symptoms.

**Major category: Implementation issues**

With an average of 3.3 documents per coding-level category, this major category is relatively less significant when compared to the other major categories. Given that this major category looks at issues related to what happened when the systems were
implemented, and that of the reports examined, many were not implemented, it may be that the importance of the issues is not reflected by the extent of passages coded. Nevertheless, the coding-level category of transition was identified in six documents. The coding-level category refers to issues surrounding the incorporation of the system into the business environment, and two key issues relate to the preparation for the transition (especially in terms of training), and the impact on the day-to-day operations of the new system.

In some cases, the training supplied was of poor quality, as was the case at the California Department of Social Services:

    Lockheed supplied incomplete training, an unstable training environment due to system functions that did not work, and inadequate training materials. ... According to our review, these problems occurred because Lockheed began training before it completed system development. Therefore, Lockheed's training materials were incomplete and outdated. ([6], p24)

and at the London Ambulance Service:

    Training provided to CAC staff and to ambulance crews was incomplete and inconsistent. ([5], p5)

In one instance, ambitious requirements meant that the system was overly complex when delivered:

    The audit also found that agencies identified advanced and untested functionality as a fundamental requirement for their business. This resulted in agencies purchasing products that offered functionality that was too complex or advanced for their requirements, increasing the difficulty and cost of FMIS implementation and post implementation management. ([9], p36)

The other key issue was the extent to which the new system was supportive of the way the users worked, as was the case with the National Probation Service:

    Users have found CRAMS difficult to operate. Consultants commissioned by the board overseeing the programme reported that the user interface contained defects that compromised the ability of users to perform their work. The Home Office did not ensure that the development of CRAMS kept pace in all respects with changing business needs, for instance it does not provide local probation services with direct access to operational data held by other areas in order to help in the transfer of case information, nor does it provide a national database to support new local procedures to improve the management of high-risk offenders. Generally services were having to rely on paper files, card indexes and registers to retain and access information on offenders presenting a risk of harm to the public. The Chief
Inspector of Probation has commented that this lack of IT had not compromised public safety or put staff at risk. ([7], p3)

With some exceptions, such as the Australian Diplomatic Network project ([3]), there were considerable problems with the delivered system, especially from the users perspective.

Summary

The first-order coding of the documents produced six major categories of issues related to project outcomes. While some of these issues are confined to a minority of the projects reported on, three issues emerged in all of the reports: the management of budget, the management of risk and the internal management of the project within the project team. These issues are not unrelated, nor are the other issues that appeared in a majority of the reports. The next section of this chapter describes the process used to uncover these relationships in order to identify the common themes that apply across the projects reported on.

6.4 Meta-Theory: A Model Emerges from the Data

The aim of this step in the use of the meta-study method is to identify commonalities across the cases coded in the previous step. In this particular instance, it was concerned with drawing out common themes that the authors of the documents were alluding to in their writings. The purpose of this is to be able to identify abstract concepts from the data that are representative or characteristic of the data as a whole, but not necessarily to one item of data. It is these abstract concepts that are used in the meta-synthesis stage to relate the theory to the data.

The coding structure that emerged is shown in Figure 6.2. Four major themes were identified, each with several sub-categories. The categories shown in Figure 6.2 are the end result of the process of seeking out the patterns in the data: the journey from the initial codings as shown in Figure 6.1 to those shown in Figure 6.2 involved continually asking “about causes and consequences, conditions and interactions, strategies and processes, and [looking] for categories or concepts that cluster together” (Neuman 2000, p423). Full details of the categories that emerged are contained in Appendix J.
However, while the second-order coding resulted in a hierarchical set of relationships, as shown in Figure 6.2, there were also present a number of relationships between the sub-categories, and these relationships are better represented as shown in Figure 6.3.

Note: Quotes from the reports presented in this section are in some cases duplicates of those in Section 6.3. They are repeated here in order to illustrate a particular point being discussed in the context of second-stage coding.

![Diagram of Second-Order Coding Categories](image)

**Figure 6.2: Second-Order Coding Categories**

As shown in Figure 6.3, the ten sub-categories are arranged to illustrate both direct relationships that were explicitly identified in the data (for example, the relationship of *Transition Arrangements* to project outcomes, shown by unbroken lines), and indirect relationships implicit in the data (for example, how *Project Execution* affects *Fitness to Task*, shown by broken lines). This section describes and illustrates the sub-categories and the direct and indirect relationships that emerged from the data as a result of the second-level coding.
The first area to be considered is concerned with the project team itself, and in particular the skills of the team and their approach to risk management, and the impact of these on project execution. The skills specifically identified as pertinent to project execution were of two main types: general system development skills and the more specific project management skills. An example of the former is illustrated by the UK National Probation System:

In January 2000 consultants reported to the Home Office that its Information Services capability was badly under-resourced with misaligned skills, and that this was exposing the Home Office and probation services to significant business risk. ([7], p7).

Assigning project managers from within the agency was a problem for some, such as in the Financial Management Information System in Australia:

Most agencies experienced difficulty accessing appropriately skilled project managers from within the agency. To address this problem some agencies appointed external project managers for the implementation, while some of the other agencies appointed internal project managers with some of the required skills set. The audit found that agencies which appointed internal staff with financial management skills generally had more successful outcomes. ([9], p33)

while turnover compounded the issue for others, as was the case for California’s Department of Social Services:
Throughout the life of the project, the State’s QA contractors raised concerns about the quality and number of Lockheed’s staff, which experienced a high turnover rate that adversely affected the project. For example, Lockheed’s project manager and conversion manager each changed five times during the project. ([6], pPS3)

It is evident that there was an intent to staff projects with experienced project managers, however, it was the implementation of this intent that fell short of the ideal, ultimately increasing the risk faced by the project, as illustrated by the UK’s National Probation Service project:

As the NPSISS programme progressed, very little, if any, project management training was provided to staff who joined the NPSISS team. And, the formal project management controls which had been established at the outset of the programme fell into disuse. ... The consultant’s report, in January 2000, identified a badly under-resourced Information Services capability with misaligned skills, and hence an under-performing information services function which was exposing the Home Office and probation services to some significant business risks. ([7], p24)

The risk profile of the project, and specifically how this risk was managed by the project team, was another significant sub-category to emerge from the reports. That external management was conscious of the need to manage risk is evident, however the problem that emerges is that the project team often fails to carry out the tasks associated with the creation and active management of project risks, thus situating the problem primarily within the project team. This is illustrated by the US Coast Guard system:

USCG developed three different risk lists, and none of the risks were assigned a severity rating. Risks on two of the risk lists have not been prioritized. USCG developed detailed mitigation strategies for some, but not all risks. For example, detailed plans exist for data migration and transition risks, such plans do not exist for managing user expectations and VDS, instability risks. ([8], p37)

and the UK Benefits Payment Card project:

The purchasers’ joint procurement team made strenuous efforts to identify the risks of the project. In March 1995 they compiled a register comprising 224 risks, including virtually all those that could have been foreseen and those that eventually impeded the delivery of the project. However, this register did not include assessments of each risk’s probability and impact, nor did it allocate risks to "owners" for management, or propose options to manage the risks. We found no evidence that this formal register was subsequently further developed and actively used in the project, though some of the risks it contained were identified again in subsequent registers later in the project. ([10], p7)

The end result of this was to degrade the execution of the project. With inadequate skills leading to unexpected problems:
Among its reasons for the increases, the DMV reported that it had underestimated the scope of the project, the system architecture design took much longer than planned to complete, and the development process proved to be more complex than expected. ... According to the DMV's former chief of EDP Service, the project’s management felt that it could eventually overcome the technical problems. Therefore, the DMV's management saw no reason to halt the project. ([2], p21)

and the failure to manage risk causing project delays, increased costs and functionality issues:

The process of identifying, documenting and planning for the management of selection, implementation and system risks was not adequately undertaken [by many of the agencies]. This limited the likelihood of agencies effectively minimising the occurrence and impact of risks. Realisation of risks contributed to project delays, increased implementation costs and functionality gaps with the implemented product. For example, most agencies identified the risk of cost creep during detailed evaluation, but then did not effectively manage it. ([9], p30)

then major problems were inevitable:

The DMV progressed beyond the developmental stages of the DBR-the operational assessment and the working model-even though it had failed to accomplish the objectives of each stage and had not resolved significant technical problems encountered during the development process. In its unsuccessful attempt to implement the DBR, the DMV spent an additional $34.6 million. Rather than complete each stage as planned, the DMV substantially modified the stages or failed to complete them altogether. ([2], pS2)

What emerges is a picture of inappropriately skilled project teams, both in systems development and project management, failing to produce technically acceptable products, and failing to adopt prudent risk management strategies that could identify and address emerging problems.

One dimension that can be used to assess the products produced by the project teams is their fitness to task, that is, the extent to which they are supportive of the users of the system: that many were not emerged as a significant sub-category. The relationship to the work of the project team is clear:

Because of the defects in SACSS, the State twice suspended installation of the computer program in the counties. Immediately after the first group of seven small counties had SACSS installed, the State and counties decided to stop further installation and undergo an assessment period. Problems causing the assessment included incomplete or non-functional forms and unreliable data. ... Finally, the impact on the counties of SACSS’s failure involved more than financial costs and losses. One county that used SACSS and then turned it off indicated that the system defects corrupted data so badly that employees are still discovering the errors today. This same county went on to indicate that the problems with SACSS had a devastating effect on employee morale and angered the public. ([6], p21-22)
The judgment of the product was identified as being influenced by the transition arrangements for introducing the system, and in particular the conduct (or rather lack) of user acceptance testing and the handling of the outcomes of those tests. In some cases, these tests were not performed:

[The FDA] did not conduct user acceptance testing. The self-assessment report stated that FDA did not have written acceptance criteria or test plans. ([1], p16)

Where user acceptance tests were conducted, the outcomes were sometimes ignored:

Installation of the system in the counties should have occurred only after the SACSS software had successfully completed both system and user acceptance testing. However, Lockheed installed SACSS in 23 counties despite the following warnings: the state QA contractor criticized system testing for SACSS, SACSS did not meet all federal and state requirements for an automated child support enforcement program, and the system failed user acceptance testing. ([6], p18)

Despite systems not meeting user requirements (or not having such standards), systems were implemented (as illustrated above), with significant issues arising about the acceptance of change by the user community:

Satisfactory implementation of the system would require changes to a number of existing working practices. Senior management believed that implementation of the system would, in itself, bring about these changes. In fact many staff found it to be an operational "straitjacket" within which they still tried to operate local flexibility. This caused further confusion within the system. ([5], p5)

One identified issue was the extent of the user’s involvement in the process of developing the system: despite aiming to adopt sound project management practices, the implementation fell short:

Several agencies developed a quality assurance review program. However, few of these agencies implemented an extensive program of review. Most agencies undertook limited review activities and, while they developed action lists, the latter were not actioned in a timely manner, or at all. Agencies also did not sufficiently involve user groups in quality assurance reviews. ([9], p34)

As a result, there was no “buy-in” to the project by the users:

There was incomplete “ownership” of the system by the majority of its users. The many problems identified with many of the system components over the preceding months had instilled an atmosphere of system distrust in which staff expected the system to fail rather than willing it to succeed. ([5], p5)

At the end of the project, the systems did not meet requirements:
At ‘go-live’ most agencies experienced problems with their configured FMIS including: functionality gaps, including aspects of asset management, budgeting, reporting and travel; incompatible business processes between the FMIS and the agency; weaknesses in the internal control environment, including data integrity and security problems; core attribute gaps, including agencies not achieving interfaces to other corporate systems and the FMIS was not sufficiently flexible to allow the system to be cost-efficiently adapted to changing needs; and/or significant user acceptance issues. ([9], p36)

The second-order coding revealed several significant issues related to the project team that impact the project outcomes, as shown in the lower half of Figure 6.3. These issues are not isolated, but are inter-related: no one issue can be identified as the cause of adverse project outcomes. However, what does emerge is another set of issues outside of the project, specifically related to the way senior management engaged the project. Three aspects of managerial engagement emerged: the type of management commitment to the project, the managerial processes that were adopted to supervise the project, and the understanding of technology exhibited by senior management. Each of these aspects was identified as significant in eventual project outcomes.

In the sub-category of managerial processes, several dimensions emerged as indicative of the importance of sound practices when it came to overseeing and interacting with projects. Lack of budget monitoring was one dimension identified:

A fundamental tool of project management is accounting for and controlling costs associated with the project. However, we found that Social Services lacked this most basic tool of project management while it spent millions of dollars of taxpayer money on SACSS. ([6], p43)

Together with the discipline imposed by undertaking cost-benefit analyses:

No cost-benefit analysis [was] conducted. At the beginning of our review, we learned that no one had performed a cost-benefit analysis for the OASIS project.... ORA officials told us that they did not ask for such an analysis in the past. ([7], p17)

In some cases, sound practices were adopted, but failed in implementation, such as the use of steering committees with specific responsibility for a project:

A steering committee was formed with a key overseeing role. However, the focus in practice turned out to be primarily on technical aspects of the project. The steering committee did not obtain timely reports on key areas such as project status, achievement of project benefits, delivery of outcomes, and management of key risk areas. Furthermore, the committee did not meet for critical periods of the project. ([3], p xv)
The level of commitment shown by senior management is one particular aspect of the broader issue of the management practices adopted by the senior management group, and the complexity of the issue of the type (and extent) of management commitment to projects is illustrated by the UK’s Benefit Payment Card project:

We found significant evidence that the Department had shown commitment to the success of the project. In 1997/98 they employed up to 1100 staff plus consultants in designing and implementing their CAPS computer systems that were to link to the Payment Card. ... Pathway told us that they felt that the Department’s commitment had reduced from around this time, in their view because the project no longer had such strong champions within the Department as before. Argument over difficult issues, mainly to do with how best to ensure the security of the system, tended to raise doubts among the participants as to their partners’ commitment to timely delivery of the project. Similarly, because Post Office Counters Ltd had a lower financial incentive than did the Department to achieve a quick changeover from order books to the Benefits Payment Card, the Department at times questioned their partner’s motivation. Post Office Counters Ltd insist that they too had a strong interest in playing their full part in delivering the entire project to time. In our view, such doubts about partners’ commitment inhibited a genuinely open and participative, approach to tackling the severe problems of the project. ([10], p6-7)

This example illustrates the “classic” issue of management commitment: what may start out as strong commitment changes over time to a lesser level of support. However, there is a variation to this evident: an attitude of continued commitment by senior management, even when evidence was available that suggested the project was in trouble:

Senior management, the project team, and the lead supplier had full commitment to the project and continually gave it their best efforts. However, they failed to identify or to recognise the significance of the many problems that were ultimately to cause it to fail. ([5], p5)

although in some cases external forces were the reason, as was the case in California’s Statewide Automated Child Support System:

The focus on meeting the federal deadlines significantly influenced many of the State’s decisions regarding SACSS. For example, although the system failed user acceptance testing, the State installed the defective system in counties in its efforts to meet the federal deadline. ([6], p53)

A second issue that is also related to the managerial processes is the level of understanding of the capabilities of technology shown or assumed by the senior management group:
The project was an ambitious one, and with hindsight, probably not fully deliverable within the very tight timetable originally specified. It had special features that added to its risks; notably its status as a pioneering Private Finance Project, the need to join up the systems of two purchasers with differing business objectives, and the need for the development and testing of more new software than was originally envisaged. (10, p5)

Overall, the management practices adopted by senior management emerged as having an identifiable impact on eventual project outcomes. However, in common with the issues related to the performance of the project team, there was no one cause of adverse project outcomes identified: they were inter-related.

In some respects, the issues identified as contributing to adverse project outcomes are similar to the factors identified and discussed in Chapter 2. However, what has been added by this study is the interrelationships of the issues, and it is this aspect of the study that will be the particular focus of the next section of this chapter: relating the findings to the theoretical model developed in Chapter 5 – the process of meta-synthesis.

6.5 Meta-Synthesis: From Model to Theory

This step of the meta-study involves relating the model of factors developed during the previous step to the CED Model of IS Project Management developed in Chapter 5. The purpose of this step is to assess the usefulness of the theoretical model of IS project management to provide an internally consistent explanation of the factors and their inter-relationships, and to extend the IS project management theory where new insight is gained during the process. This relating of the model of factors to the IS project management theory will be done in the context of three themes: project governance, user engagement and task execution.

Project Governance

This theme is concerned with the actions of those people and groups who are involved in the management of the project from a broad perspective, yet are not involved in the day-to-day detail. Typical examples include steering committees, oversight committees and statutory bodies who report on projects. The issues identified under this theme point to the importance of those external to the project who are involved in its management.
Some of the issues identified as significant are substantively beyond the boundary of IS projects: political agendas will continue to drive many decisions, including imposed deadlines and the role of independent statutory authorities. The challenge in project management terms is to bridge this divide so that the project team (and especially the management) are aware of these issues and the ramifications for the project. The goal, therefore, is to disseminate knowledge about the political and economic factors that, while outside of the control of the project, are nevertheless relevant to the project. However, the realities (in this series of cases especially) of the bureaucratic processes in government and its agencies are that this knowledge either cannot be made widely available, or is deliberately suppressed by those in authority, for any number of reasons. Attempts (from the project perspective) to identify and disseminate relevant knowledge will in all likelihood only be partially successful.

With this caveat in mind, the understanding of the effects of managerial processes, managerial commitment and level of understanding of technology in terms of the theory is based primarily around the project constituency and knowledge sharing. As described in the previous chapter of this dissertation, the project constituency is defined as the totality of those in any way connected with the project. One of the ramifications of such an inclusive project constituency is increased communication between those associated with the project. If increased communication (in the form of knowledge about factors affecting the project) can mitigate the adverse effects of the (currently) external management practices, then including these groups into the project constituency will be beneficial.

Of the specific issues in the realm of managerial practices identified as adversely affecting project outcomes, the monitoring of expenditure and expected benefits are significant. While the impetus to establish appropriate systems for monitoring expenses needs to come from established management practices within the organization, ensuring that these systems reflect what is really happening in the project can be improved by having the information readily available to the members of the project team, although the caveat about openness is particularly relevant to financial information. Nevertheless, by establishing the project constituency that includes as many involved parties as possible, and facilitating knowledge sharing among those parties, issues related to project progress and project outcomes (and especially expected benefits) are visible to
all. So although some financial information may be unavailable for wide distribution, knowledge of progress and thus benefits will be available to senior decision makers.

In a similar vein, the concept of a project constituency and knowledge sharing can be used to illuminate the issues related to the interaction between senior management and the project management by way of steering committees and similar arrangements. In the example quoted in the previous section related to this issue, there was an identifiable disconnect between the project team and management, resulting in inappropriate focus of steering committee meetings, or failure to hold such meetings. More generally, when these committees are not privy to the day-to-day operation of the project team, knowledge can be withheld in a similar manner to financial knowledge discussed earlier in this section, the only difference being that it is now not available to senior decision makers as a result of action (or inaction) by the project team.

The type and level of commitment by management to the project can also be characterised from the perspective of the project constituency and knowledge sharing, although for this issue, external pressures and personal agendas will have an important part to play. Insofar as commitment is related to knowledge about what is happening within the project, then providing for more knowledge via explicit knowledge sharing within a project constituency can help. A third feature of the theory can also be of use in explaining failure related to commitment: a failure to expose and acknowledge the expectations of senior management. In this case, working through senior management’s expectations as part of the larger set of expectations provides an avenue to lessen the chances of lowered commitment to the project.

The third dimension to management-related issues is that of the expectations of the system by senior management. In this case, knowledge sharing about what is happening in the project, combined with the exposing of all expectations, can lessen the impact of unrealistic expectations. Being able to access knowledge about the development effort, and being able to have expectations examined and debated by other members of the project constituency, provides the avenue for reconciling possibly unrealistic expectations with what can be achieved, and with what is being achieved.

In broad terms (political pressures and personal agendas aside), adverse project outcomes that are related to external management practices can be characterised as a
breakdown in knowledge sharing. This is knowledge of both a substantive nature (what technology can do), a strategic nature (where is the project up to) and of shared expectations (what is the project trying to achieve). When the necessary knowledge is shared within a project constituency, realising the benefits of sharing becomes easier than if there is a knowledge gap between the project team and senior management.

A project environment founded on the principles of a project constituency and knowledge sharing (including the expectations of the project constituents) is able to address the issues of managerial processes, managerial commitment and understanding of technology that were identified in the reports. However, political pressures and personal agendas, as well as regulatory requirements, will mean that some of the issues will remain as significant. In the next chapter of this dissertation, extensions to the theory will be proposed that will go some way to addressing these remaining issues.

User Engagement

This theme is concerned with a second group who are traditionally outside of the project team: the users. Two significant issues are focused on: the involvement of users with the processes of the project and the attitudes of the users to the changes necessitated by the project. In terms of the IS project management theory, these issues are characterised as mainly resulting from a lack of understanding by the development team of the expectations of the user community, coupled with a lack of understanding by both parties (users and developers) of the nature of each other’s work. As with the previously discussed theme, the project constituency and knowledge sharing can be used to understand how these issues come about.

In the projects analysed in this research, the user community were without exception treated in the traditional way: as external to the project team, to be consulted if and when necessary for the development team to elicit requirements, and to provide feedback when requested (which may be ignored, as in the case of user acceptance testing described earlier). The CED Model of IS Project Management developed in the previous chapter conceptualises the users as equally involved in the project, to the extent that especially early in the project lifecycle, members of the user community may
outnumber developers as issues of scope, benefit analysis and business impact are discussed and resolved.

By reframing the way the project is established using the project constituency as a base, the issues related to the role of users in a project effectively disappears. By definition, the members of the user community are part of the project, and provided the constituency is managed properly (through the adoption of more than one management team as provided by the theory) then involvement is essentially mandatory. When knowledge sharing is also part of the project management approach, the opportunity for the sharing of understanding between the differing groups within the constituency is provided for.

However, of possibly greater importance is the need to share expectations, both positive and negative, and to engage in discourse to resolve contradictions and conflicts. Through this mechanism, the issue of acceptance of change is addressed, as issues are surfaced and dealt with. This is not to imply that all issues will be resolved to the complete satisfaction of all: in practice that will rarely be achieved; the goal is to at least agree a way forward that is accepted by those involved.

The CED Model of IS Project Management provides a sound explanation of the issues associated with the role of users in projects. By grounding the project in a project constituency, and using the concepts of knowledge sharing, exposing of expectations and resolution of differences through discourse, the lack of understanding between the various groups in the project is addressed.

Task Execution

This theme is more concerned with internal processes of the development effort, and at one level could be considered to be solely related to the mechanics of managing a project, such as task identification, methodology selection or implementation strategies. However, it is useful to consider a second dimension of these issues, a dimension that is related to the CED Model of IS Project Management, and in particular to the composition of the project constituency. An explanation of these issues based on the project constituency provides an illustration of how the fundamental concepts of the model provide a basis for IS project management.
The management of risk is a fundamental task of project management. The problem is to identify, assess and define mitigation strategies for the wide variety of risk faced by an IS project. Two extreme solutions lay in either the project manager undertaking this task, or everyone involved with the project getting involved. With the difficulties associated with recruiting suitably qualified project managers (discussed in the previous section of this chapter), the first of these solutions does not seem to offer the possibility of a sound outcome, a conclusion supported by the reports analysed in this research. The alternative, involving all parties to the project, is more attractive, as it draws on the skills of a diverse population, thereby increasing the likelihood of considering risk from many angles. In reality, this solution is impractical, so a lesser number of people will be involved in risk management. However, the principle underlying this is clear: a diversity of experience, skill and knowledge is likely to result in a more comprehensive set of risk items than requiring the project manager to be solely responsible. *With a project founded on a project constituency as defined by the theory, the opportunity exists to make risk management by a diversity of people a reality. In addition, ownership of these risks remains with those who identified them, providing incentive to manage the full list of risk items.*

The way the product satisfies the goals of the project and how the changes necessitated by the system are introduced into the business can also be related to the constituency. In this case, the link is again the diversity that the constituency provides, and *by the use of the concepts of expectations and discourse, the resolution of differences between what is needed and what is delivered can be resolved before the product is implemented.* Similarly, *how the product is implemented is an issue for the constituency as a whole, with differences to be resolved through expectations and discourse.*

The issue of skills possessed by the development team and how this affects the performance of tasks associated with delivering the product, while primarily a resource management issue, can also be indirectly addressed by good risk management. *With a wider set of risk items developed by the project constituency, the implications of inadequate and inappropriate skills can be better assessed,* and therefore brought to the attention of those responsible for allocating people to the project team. In a similar manner, problems that arise with executing project tasks can be assessed in the light of a risk management strategy developed by the project constituency.
The aims of this section of the dissertation were to use the CED Model of IS Project Management to understand the issues leading to adverse project outcomes as identified in the reports and to provide an insight into how the model provides a consistent framework for addressing these issues. Relating the issues to the concepts of the model satisfied the first of these aims. The second aim was more ambitious: it sought to establish a basis for establishing the project in the first instance, resulting in a fundamental change to how projects are conceptualised. This aim is achieved by demonstrating that the CED Model of IS Project Management provides a viable alternative way to frame IS projects.

6.6 Conclusion

The aim of this second part of the research study was to establish the credentials of the CED Model of IS Project Management developed in the previous chapter by using the model to understand and explain issues identified as contributing to adverse project outcomes. From a detailed analysis of individual reports a model of factors affecting project outcomes was developed. This model of factors was then discussed in terms of the CED Model of IS Project Management. From this discussion, it is evident that, based on this set of reports, the model not only provides a means of understanding the issues, it also provides a means of reconceptualizing how IS projects are established. In the following chapter of this dissertation, the implications of this piece of research are further examined with the aim of extending the model.
Chapter 7: Discussion and Conclusions

7.1 Introduction

In Chapter 5 of this dissertation, a theory-based model for the management of IS projects was presented, the CED Model of IS Project Management. This was developed through the action research project, described in Chapter 4, and assessed for validity through the meta-study, described in Chapter 6. It now remains to explore the implications of this model in the wider context of project success and failure that was described in Chapter 2. Therefore, this chapter takes the results and interim conclusions discussed in Chapters 4 and 6, and looks at the relationship of these results in the light of previous research. In addition, the model described in Chapter 5 is expanded to include the new insights gained in the two research tasks undertaken.

This chapter is organised as follows. The first three major parts present a discussion about the measures-based methodology and changes to the methodology suggested by the research, a discussion about the CED Model of IS Project Management and extensions suggested by the research, and a discussion about the research methods used. These are followed by sections on the implications of this research for IS project management in general, for IS theory and for IS practice. The chapter concludes by identifying areas of further research.

7.2 The Measures-Based Methodology

Introduction

The project management methodology applied in the action research project used processes based on a set of measures that were derived from the project’s objectives, as described in detail in Appendix A. These processes and the measures derived from the methodology were assessed by the project team in terms of its contribution to the improved management of the project. In particular, the processes and the measures derived from the methodology identified additional deliverables for the project, and the
measures that arose from the methodology initiated action by the project manager that was assessed as contributing to the overall success of the project.

In implementing the project management methodology, a number of issues and observations came to light. From the perspective of the project management office (PMO), the cost (in terms of time of members of the project team) of working through the detailed steps needed to be outweighed by the benefits, so it was incumbent on the project planning group in particular to pay attention to ensuring that the process was efficient. The focus on objectives, both those of the PMO and the longer-term ones of the business owner, gave the project team, and the project manager in particular, an improved understanding of the project, and provided a counterpoint to the task focus that had driven the project planning in the early stages. This cross-check (between a task focus and objectives focus) gave some degree of assurance that the risks faced by the project were being managed better, and this was supported by the measures themselves during the conduct of the project. In using the methodology, there was no identified need to delve deeply into its theoretical basis.

In practice, the measures were found to be supportive of the project management tasks: in the IS project that was the focus of the action research, two of the measures identified actions that needed to be taken (see Section 4.6). However, of equal interest was the observation that by giving attention to the events that were the subject of the measures, actions were the result. In any event, the measures provided a medium of communication between the various interested parties associated with the project.

Each of these aspects of the methodology is discussed in detail in the following sections, where reference is made to the larger context of project management.

*Identifying Project Deliverables*

The identification of deliverables for the project that had been previously missed during early project planning was an unanticipated benefit of applying the measures methodology. The initial project planning was carried out prior to the action research project getting under way, so the use of objectives as the starting point for establishing project outcomes was in reality a cross-check of the task focus adopted during early project planning. The project manager reported that he believed this opportunity to
consider the outcomes of the project from two perspectives increased the likelihood that the outcomes were fully identified. In this sense, risk was being managed.

This result demonstrates the inter-connectedness of the activities in project management: one activity has implications for other activities. It also highlights the iterative nature of the planning process: initial plans may need to be modified as those managing the project gain a greater understanding of the project. Any methodology proposed needs to recognise this interaction. It also suggests that some measure of redundancy in planning can be worthwhile: being able to check assumptions, or use another perspective can decrease the risk that activities and deliverables have been missed.

The use of a task-focus by the project manager reflects the planning guidelines that are contained in contemporary IT/IS project management texts under the heading of Work Breakdown Structures (for example, Phillips 2002, Hallows 1998, Project Management Institute 2000). This is characterised as a phased approach to planning, and typically follows the decomposition of project scope to phases to work units to tasks (Phillips 2002, p135). It is assumed that there is a lifecycle model that can be used to identify the phases of the project, such as requirements definition, hardware selection, software development and implementation. A variation on this (and similar to the objectives-based identification of outputs) is the Product Breakdown Structure (for example, Schwalbe 2002, Association for Project Management 2000).

While the product breakdown structure is in principle equivalent to the use of expectations to identify outcomes, there are some differences. The main difference is that the variety of outcomes identified by the use of expectations is greater than a focus on products alone. In the case of the product breakdown structure, focus is on product areas (Schwalbe 2002, p100), rather than specific outcomes. This leaves open the possibility of some outcomes being overlooked. The use of expectations focuses on the final (possibly long-term) outcomes, and by its incorporation of the social setting that the project is part of, will include a variety of outcomes. This need to look further than the product-focused outcomes has been recognised:
The sample [work breakdown structures] shown here seem fairly easy to construct and understand. Nevertheless, it is very difficult to create a good WBS. To create a good WBS, you must understand both the project and its scope and incorporate the needs and knowledge of the stakeholders.

Schwalbe (2002) p103, emphasis in the original

The potential of the project expectations to be able to identify activities and deliverables in addition to being the basis for measures is an idea that needs further development. In the expanded CED Model of IS Project Management, the expectations are used as the basis for the project scope and the management measures. In order to use these same expectations as the basis for deliverables in particular, it may be necessary to be more definitive as to what the members of the project constituency expect in terms of outcomes (rather than being expressed in general terms). The most likely way for this to happen is for the expectations to exist in some form of hierarchy, with the general expectations leading to specific outcomes. Early in the project the specific outcomes will be in a preliminary form, firming as the project progresses.

Managing Risk Through Measures

In terms of IS projects, risk relates to the occurrence of unplanned events that can have (usually) an adverse effect on the conduct of the project, by requiring additional work or unplanned expenditure. One of the goals in managing a project is to manage these risks through anticipation, evaluation and the development of contingency plans. Some of the risks (such as political events) cannot be managed to any great extent, but others can be, and often it is the case that the sooner the issue is recognised, the less impact it has on the project. So it was with this project in the case of the change in service delivery levels. By becoming aware of this change in service delivery at a relatively early stage in the project, the underlying issues could be identified and addressed, in this case by working with the staff of the centre being closed. Similarly, by becoming aware of the rise in outstanding issues, it was possible to modify practice to focus attention on the issues. In both cases, ignorance of the issues may have had significant consequences for the project at a later date.

The motivation to provide project managers with an early insight into potential problems lies at the heart of the purpose of the measures-based methodology proposed in this dissertation. Providing project management with tools that enable them to identify issues before those issues escalate is translated by the methodology into a
useable prescription for practitioners. The two instances of early insight encountered in this project may have been peculiar to this project, so further evidence of the ability of the measures to provide early insight of looming problems is required.

The use of early insights based on information from the project itself to assist in managing projects is a relatively new field. In the context of the strategic management of firms, the theory of weak signals (Ansoff and McDonnell 1990) provides a framework for incorporating information from events into normal management practices. This theory uses a range of response strategies (from simple ‘awareness’ through to ‘direct action’) compared to the knowledge of the event (from ‘sense of threat or opportunity’ through to an identified outcome) to process the information. In order to use this theory, there has to be access to the information, the recognition of the role of the information in management terms, and flexible management practices:

...it is [the] management flexibility which will be the principal difficulty in firms’ adaptation of weak signals management. 

Ansoff and McDonnell (1990) p390

The extent to which this flexibility is possible under current project management practices is not clear, given the prevalence of prescriptive project management tools (such as the use of work breakdown structures and Gantt charts), and the use of software tools.

In an attempt to understand the applicability of weak signal theory to project management, (Nikander and Eloranta 1997, 2001) conducted research aimed at developing a model for project managers. Their model, reproduced in Figure 7.1, contains two elements that relate to the current research. Firstly, the starting point is an observation (labelled A in Figure 7.1). This may be either an observation about an external event, or an internal event. While it is important to be cognisant of any information, if there is a structured attempt to look for relevant information, it may well come to notice more readily. Therefore, any structured method of collecting information about a project has the potential to add value. The use of measures that are directly related to the project is one such way of structuring the collection of information.

Secondly, the fourth step of the project management weak signals model (labelled B in Figure 7.1) is risk analysis, and it is this step that provides the link between the use of measures to collect information and the assessment of those signals for risk to the proje
ct. In this way the measures-based methodology makes a positive contribution to the management of project risk.

Process and results measures provide the distinction needed to be able to confidently identify a measure as being able to provide early warnings to project management, with process measures being those that relate to internal processes. By monitoring the process measures in a project, it should be possible to significantly improve the identification of potential problems. However, this assumes that measures can be characterised as process or results measures: it is not clear from the work done to date that this is possible, and if possible, what the rules are. In addition, there is the complication that processes in a project are not necessarily as discrete as, for example, a manufacturing process. If there is overlap of processes, then the distinction between process and results measurements is not at all clear. Therefore, it may be necessary to redefine the types of measures used in projects in order to cater for this lack of clear borders between processes.

Cost-Effectiveness

The host organization had a clear agenda to ensure that any changes to their project management approach was cost effective, that is, the cost of change did not outweigh the benefits. In the project that was part of the action research, the project planning group were conscious of this requirement, and kept the time spent specifically on working the methodology to a minimum. In a project of this type, there is no clear equation that could be used to balance cost versus benefit, as the benefits were intangible, and there is a finite probability that the issues would have arisen in any event. However, the opinion of the project team was that the increased visibility of risks, the availability of “hard” figures that could be used in discussions with those outside of the immediate project team, and the discipline of measuring - and thus giving attention to - issues within the project, outweighed the extra hours spent in working through the methodology.
In the broader context of project management, the use of any methodology carries with it an overhead. The question then becomes one of using the methodology for identified purposes, rather than merely following the rules. It is then possible (in most cases) to
identify value that is being added by each of the steps in the methodology, and make a judgment as to whether they are useful.

In a formal planning scenario, the effect of a change to the project management methodology should be reflected in the assumptions included in the cost model used. There is little research on the cost of the various components of an IS project: most look at the entire project and apply an algorithm (see Kemerer 1997 for an overview of cost models for software construction projects). It therefore becomes a subjective opinion as to the value of the change.

Being selective about which parts of a project management methodology to follow requires that those making this call are sufficiently experienced and knowledgeable in project management. It is therefore problematic as to whether this call should be left up to individual project managers: the evidence in the host organization for this research was that the project managers were relatively inexperienced, and therefore unlikely to be able to make an informed choice. In the context of the CED Model of IS Project Management put forward in this dissertation, the need for a group to establish and monitor use of the methodology is apparent.

Refining the Measures

The process used to identify the measures resulted in some thirty-eight measures being identified from the objectives. Each of these had a part to play in the management of the project; however, it was considered that monitoring such a number would not be cost-effective. Consequently, a smaller set was chosen as the set of measures to be monitored. The two main heuristics used in this choice were the importance of the underlying objective, and the cost of obtaining the measures. The first of these carried more weight. From a theory perspective, there was also the question of achieving a balance between process and results measures: in practice there were approximately equal numbers of each in the selected set.

The decision by the project planning team to select a subset of the measures by focusing on the underlying objectives reflected the confidence of the team in the set of objectives that had been identified for the project. On the first pass through (from objectives to questions to measures), there was little attention to the relative importance of the
objectives: this came as a second stage of identifying the measures. The identification of the measures as either process or results measures was the result of a separate analysis of the final measures set, undertaken as a verification and validation exercise. There was no conscious effort to create a final set that contained approximately equal numbers of process and results measures.

The selection of measures based on the relative importance of the underlying objectives supports the close link between objectives and the measures that can be identified to monitor achievement of the objectives. In the revised methodology, the link is between the measures and the underlying expectations; the resultant outcomes and (particularly) consequences also become important.

While there is little research on the use of performance measures derived from objectives in the field of IS projects, there is a substantial body of work in the use of performance measures in organizations in general. While some of these are focused at being complementary to periodic financial measures (Johnson and Kaplan 1991), others have a broader focus, taking into account objectives, strategies and plans (Otley 1999, Kloot and Martin 2000). The main thrust of this research is to identify the role that performance measurement has in the overall management of the organization.

The next step is to take these general performance measures and use them for day-to-day management purposes (Hronec 1993, Zairi 1994). This application is in line with the discussion (Appendix D) on process and results measures. It is when these measures are used proactively that they become useful for giving an early warning of possible future problems (Rivers 1999). The identification of these proactive measures from objectives offers project managers guidelines for their own projects (Lopes and Flavell 1998).

The importance of the objectives as used in the project that was the focus of the action research reported in this dissertation reinforces the importance of what evolved from the notion of objectives, the expectations. As will be developed in more detail later in this chapter as part of an extended theory-based model, the expectations are the source of the measures, scope and success criteria. The expectations directly influence the day-to-day operation of the project, and are used in the final evaluation of the project. The major issue that requires further consideration is how to assign relative importance to
the expectations, so that this can flow on to the measures selection process. At this stage of development of the theory-based model, the most promising area for understanding the relative importance of the expectations is through the project discourse, where members of the project constituency seek to reach accommodation on their possible inconsistent expectations. Part of this discourse can include discussions aimed at agreeing the relative importance of the expectations.

*Interpreting the Measures*

Once the measures were selected, the collection of the base data was incorporated into the reporting protocols for the project. As shown in Chapter 4, the measures were maintained as spreadsheets, and the result interpreted mainly through graphs. Two features of this process of monitoring are interesting: firstly, it is the trend of the data that is important, not the absolute value at any one data collection point, and, secondly, the majority of the measures do not show any trend of importance. Both of these results have implications for the use of the measures during the project.

In the case of the measure related to the number of critical issues, it was the change over several weeks that was the important information provided by the measures. In any one week, the absolute value had no particular meaning, as it was not possible to predict when important issues would arise. However, an especially high value in any one week would not have needed the measures graph to bring the situation to the attention of the project manager: it would have been evident from other sources that something was amiss. Therefore, it is the trend of the data that can reveal a more subtle development of a potential problem. The value of graphs is thus clear: provided that the graphs are constructed well, trends become evident.

This use of measures to identify emerging issues does not imply that all of the measures contain such information. Despite the prevalence of evidence that some IS projects fail, this does not imply that all or the majority of projects fail. It is therefore quite possible that projects will proceed to completion without any of the measures revealing any emerging problems. From this perspective, the measures are part of the management of risk: it is prudent to monitor the key indicators of the health of the project in order to reach a level of confidence that all is progressing well.
In the context of the use of measures for the management of IS projects, these results suggest that it is possible to use measures derived from objectives or expectations in a way that is similar to the current way progress and other facets of a project are reported. If this is so, then there will be a familiarity with such reports, both for use within the team, and for reporting to project management groups. This is borne out by a related finding for this project: the project manager commented at one point that the use of measures was not new (to him), but that the discipline of identification gave meaning to the measures, and structure to the reports used. Previously, it was more “hit and miss” that appropriate measures were being used.

In the context of reporting to the project steering committee, the set of measures provided the project manager with consistent ways of measuring progress. The project manager found that it was only necessary to highlight the exception cases; in this project the number of important issues and the service levels of the existing data centre. This reporting to the project steering committee, which has other projects to consider, supports the need for consistency of measures. If the measures used to report a particular project are drawn from a common pool, then between-project comparisons can be conducted. However, the use of such a common pool should not be at the expense of measures that are important to a particular project, as indicated by the expectations.

In his book *Vital Signs*, Steven Hronec (Hronec 1993) presents a model for achieving *quantum performance* (a level of performance that optimises value and service) within an organization, as shown in Figure 7.2. In this model, the focus is on cost, quality and time, driven by strategy translated into goals, then applied to the processes of the organization. This model identifies a sequence to be followed in developing performance measures, as shown in Figure 7.2. In many respects, this is similar to the measures-based methodology described in this dissertation, with the main difference being the source of the strategy (expectations), and the consideration of factors in addition to cost, time and quality. In the model shown in Figure 7.2, the steps labelled A and B identify the output and process measures. Therefore, the model shown in Figure 7.2 may provide a starting point for a more formal consideration of how to identify these two types in the measures-based methodology.
The adoption of a common pool of measures as a resource for each project has implications for the knowledge sharing that forms part of the theory-based project management model, in two ways. Firstly, the knowledge sharing involves information about the current measures being used in current and completed projects, and secondly, the experience of using these measures needs to be available to members of the project management team. These two items form part of the historical record for the organisation, and require a commitment by the organisation to establish and maintain information beyond the life of any one project.

![Figure 7.2: A Model for Using Measures to Achieve Quantum Performance](image)

From: Hronec (1993) p25; labels added

Starting with the idea that there is a need to maintain information about a project beyond the life of that project, it is then a small step to conceive of a more formal
knowledge repository that can contain information such as organisational strategies, staffing details, resources and other information used by a project. From this, it is then a small step to viewing the knowledge repository for a particular project as a subset of a larger organization-wide knowledge repository.

*Attending to the Measures*

The use of a set of explicit measures to aid in the management of a project revealed a phenomenon that has been observed in other settings: bringing an item into a persons span of attention causes further consideration to be paid that item, sometimes subconsciously. In the context of managing a project, having a list of measures that are being used caused attention to be paid to those measures and the implications of those measures without the values actually being used. As an example, being aware that a measurement is being made of service levels causes a consideration of this aspect of the project to be thought about in more detail: an example of heedful interrelations (Tsoukas and Chia 2002). The values for the measure are additional information, not the primary cause of consideration of that measure.

This finding suggests that the list of measures developed from an analysis of the objectives or expectations can exist in two forms: a formal set of measures (as was used in this project), and a checklist of the remaining measures that are regularly scanned so as to make a judgement (based on other information from the project) as to whether further analysis is warranted, that is, to “promote” a particular measure into the set that is monitored regularly. However, this presumes that additional information is available and that the person or persons making the scan of the second list are sufficiently experienced to be able to make the necessary connections.

The main point here is that the measures are not an end in themselves, but rather “a means for enhancing strategic dialogue throughout the organization” (deHaas and Kleingeld 1999, p233). That is, by bringing the issues implicit in the measures to the attention of people, dialog (in the sense of mentally considering them) is likely to occur. This need to bring items to the active attention of people before they are attended to has its root in cognitive psychology. Neisser’s theory of attention is one theory that is relevant:
People actively choose the information that they attend to. Cognition is guided by expectations. Expectations are not very specific but rather general anticipations about what sort of things we will perceive. Nevertheless, our expectations are powerful determinants of the information that we perceive; information is actively extracted from the environment, nor passively received.

From: Benjafield 1992, p37

Note that in this passage, the term *expectations* is used in a different sense from the use in other parts of this dissertation: in this passage it is used in the sense of what people are aware of. In the context of the research reported in this dissertation, it means that if people are made actively aware of issues, they are likely to seek out information about those events; conversely, if they are unaware of issues, the information about them will not come to their attention. Therefore, having the list of all possible measures divided into a subset of those being actively monitored and those acting as a checklist is a compromise that achieves a balance of cost of measurement versus the value of attention.

This suggests that further analysis needs to be carried out on the role of measures in managing a project. The current formulation of the theory-based model is that a subset of the measures is used in practice. A possible revision is that all measures can be used in some form. At this point, it is not clear what the implications of this extended use are for the knowledge sharing within the project and as a part of a knowledge repository.

### 7.3 The CED Model of IS Project Management

*Introduction*

The CED Model of IS Project Management developed as part of the action research reported in this dissertation was used as a framework to explain what had happened in a number of projects that had been reviewed due to perceived problems: the meta-study reported in the previous chapter. This meta-study produced a number of common themes across the projects, with implied additions and/or clarifications to the model that was developed in Chapter 5. This section of the current chapter discusses those changes as they relate to the model as a whole, and to current research and models in project management.
These additions and/or clarifications affect all of the five fundamental elements of the model, suggesting a richer set of interconnections between parts of the model than was identified in the initial version that was developed in Chapter 5. There are five essentially discrete additions and/or clarifications: the process of discourse, an expanded view of expectations, the actual management of the project, project evaluation, and project governance. Each of these will be discussed in this order, as there are dependent relationships arising from each of these.

*The Need for Discourse*

Communication between the parties involved in a project emerged as an issue in several of the themes that came out of the meta-study. This was across all areas of the project, with two areas standing out: communication with the user community, and communication with those who were in a position to influence the future of the project. In terms of the CED Model of IS Project Management, this is characterised as a failure to properly assemble and manage the constituency. The question then arises as to how these particular issues should be addressed.

In terms of the user community, the failure involved the two key areas of IS projects: getting the eventual end-users involved early in the project, so that the “real” requirements could be determined, and secondly, ensuring that these same users are involved during implementation. The importance of user involvement has been well established in the literature (for example, Choe 1998, Cooke-Davis 2002, Clarke 1999). Despite this, the message does not seem to have been heard or understood. The meta-study reveals that reliance is being placed on either a too-small sample of the user community, or through the use of people who are seen as being expert in what the system *should* do, not what it actually *needs to do*. This attitude was also prevalent in the host organization for the action research project, where reliance was placed on the managers and experts from the business units for advice on the requirements for the projects.

A second common thread in the meta-analysis was the failure to manage the political environment for the projects. This took three forms: relationships between the project team and the next level of responsible management, relationships with eventual users who need to be co-opted to use the product, and regulatory bodies who have the power
to review the project. While the projects analysed in the meta-study were all government projects, similar relationships exist within commercial organizations. While the issue of how executive management and regulatory bodies relate to the project constituency will be specifically addressed later, the focus here is on the need for communication between these parties.

The importance of communication has been recognised as an important factor in successful projects (Waterson, Clegg and Axtell 1997), including by the host organization for the action research project. However, this is often interpreted as communication from the project team to the business clients and the eventual users of the system, and is characterised as primarily a one-way flow from the project teams to these groups, although usually some mechanism for feedback is present. This is essentially horizontal communication; vertical communication occurs from the project team (especially the project manager) through steering committees to executive management and external bodies. Especially within government, reporting tends to be through the established hierarchy, with filtering occurring at each level. The result can be that a sanitised and possibly simplified picture is presented to these parties.

This presents a very real dilemma. It is unlikely that power relationships and reporting lines will be modified simply to accommodate a revised way of managing projects. Therefore, the CED Model of IS Project Management needs to treat this as a constraint, and be designed accordingly. Therefore, the first change is to modify the definition of the constituency to recognise that there will be some people who, while certainly involved with the project, will not (either through choice or direction) be able to engage in free communication with other members of the constituency. This again involves the issue of project governance that is discussed below. The implication is that a revised definition of project constituency is required, as follows: “the project constituency involves all those involved with a project where there is the capability of open communication”. Those that are excluded by this definition (such as audit bodies) are catered for by proxies (see below).

The question then becomes one of how this communication is to be managed. Under existing project management practice, communication is seen as one of the responsibilities of the project team (those that are producing the product). In the theory-
based model, there is a wider set of possibilities, arising from the expanded constituency. Therefore, the role of communication (discourse) management within a project is defined as separate from the day-to-day management of the tasks associated with the project (such as software development). This gives it the necessary profile as being one of the keys to project success.

One avenue for tackling the political problems is by looking for a greater degree of agreement at the senior management levels as to the purpose of a project. Insofar as this is possible within any organization (government or commercial), one proposal to actively achieve this is through configurational theory (Sauer, Southon and Dampney 1997). The main proposition of this theory is that it is an incompatible configuration of the organization that leads to eventual project failure through encouraging failure-related behaviours. Thus, a prerequisite for project success is an organization whose structure and strategy is consistent with the aims of the project. This is consistent with the CED Model of IS Project Management proposed in this dissertation, as the organizational environment (as expressed through its configuration) is complementary to and supportive of the project constituency.

The way members of the project constituency communicate can be analysed in terms of the Theory of Communicative Action (Habermas 1984). When acting as part of the project constituency, members are in a social action situation, with an orientation towards reaching understanding, that is, they are involved in communicative action (Habermas 1984, p285). “Communicative action leaves room for alternative courses of action which can be evaluated in communication processes until a mutual consensus is achieved with benevolent intention.” (Wigand, Picot and Reichwald 1997, p69), although the interpretation of the Theory of Communicative Action that is used in the context of this dissertation considers that it is the intent to work towards understanding that is important (Cecez-Kecmanovic 1999). In the context of the CED Model of IS Project Management proposed in this dissertation, the focus of the communication processes is on the expectations of the constituents, and in particular moving towards a common understanding of the different points of view inherent in those expectations. While merely evaluating alternatives may not necessarily lead to consensus, undertaking this evaluation within the principles of communicative action (which assumes good intent), does provide the basis for reaching a mutually acceptable (though
not necessarily optimal from any one point of view) outcome. This ideal of communicative action forms a key part of the theory-based model developed in this dissertation.

Within an organization, and in particular within the project constituency, communicative action in the form of a discourse leading to coordination of action plans and accommodations will rarely occur spontaneously: there is a need for some person or group to act as mediator of the activity. With the importance of the communicative processes to the functioning of the project constituency, it is proposed that the role of a communication coordinator should be a role with equal visibility to the role of managing the development tasks associated with the project (the conventional project manager). This is shown in Figure 7.3.

Figure 7.3 defines the role of the communication coordinator as being to mediate and facilitate discourse between members of the project constituency in order to reach shared, inter-subjective understanding about the project’s expectations.

![Figure 7.3: Incorporating Accommodation into the Model](image)

**Project Evaluation**

A considerable part of Chapter 2 is devoted to a discussion of the ambiguity associated with success criteria for projects, with the major conflict being between the short-term
objectives of the project team, and the longer-term objectives of the users of the end product. Expectations express the anticipated outcomes of the project, so a refinement process to turn these into criteria for judgement of success is one use of expectations. It is likely that in their raw form, the expectations will not be in a form that permits a judgement as to whether they have been realised. However, it should be possible to transform them into a suitable format. Note that there is now no clear, single criterion: the judgement as to success and failure can only be answered in the context of the underlying expectation.

Being able to use expectations as the source of criteria for evaluation of the project requires that the expectations be comprehensive. In particular, they need to be able to distinguish between the short-term goals (such as cost and time) and longer-term goals (such as staff productivity). This is related to the earlier discussion about the process of discourse: in order for these expectations to be translated into evaluation criteria, they need to be made explicit during the determination of the expectations.

The availability of a clear path from the project constituency to explicit project evaluation criteria provides an opportunity for meaningful judgments as to whether a project has been a success or failure. However, this cannot be a binary judgement, unless all criteria are satisfied (success) or not (failure). In the majority of cases, it will be a weighted judgment, and then the value of such a judgment (that is, expressed in terms of success or failure) needs to be questioned. In effect, there is a multi-dimensional model of project evaluation.

While there will be commonality of the dimensions of evaluation from project to project, essentially each project is unique. This is a departure from many current techniques that attempt to prescribe evaluation criteria independent of the project. For example, was the product delivered according to the plan? In terms of the multi-dimensional model of project evaluation based on expectations, this question has little meaning. Under the multi-dimensional model, the question is phrased as, was the product delivered in a way that all those involved accepted it as appropriate under the circumstances?

The notion of evaluation criteria based on expectations was discussed by Lyytinen and Hirschheim (1987) in their survey of IS project failures. In their view, expectation
Failure had as the criteria the values of the stakeholders and their perceptions of the information system. This model was expanded into the notions of correspondence failure (criteria: quality), process failure (criteria: time and cost), and interaction failure (criteria: user attitudes). The multi-dimensional model described in this dissertation is consistent with the model of Lyttinen and Hirschheim, but extends it by explicitly defining how the expectations are identified, and how accommodations are reached to reconcile possibly initially conflicting views. Lyttinen and Hirschheim also make the observation that the notion of expectation failure is a formative assessment: it provides an explanation as to why a situation of success or failure was reached. On the other hand, the derived notions are classified as summative assessments: they do not provide diagnostic information.

Interaction between the developers (technical staff) and the users has been the focus of an organizational model of IS failure (Sauer 1993). In this model, failure is characterised as resulting from a breakdown in communication between these two groups, resulting in a widening gap between what the developers perceive as being required and what the users need. A similar organizational model considers a lack of fit between the information and its organizational context as a source of failure (Sauer, Southon and Dampney 1997). In this model, if the system as it is being developed does not reflect the way the organization is constructed, then the information system is unlikely to succeed in the long term. Both of these related models are consistent with the model described in this dissertation. However, the CED Model of IS Project Management developed in this dissertation adds a means whereby these organizational issues can be addressed in a structured way: through discourse and by the makeup of the constituency.

In a study based on organizational narratives, Fincham (2002) characterised success and failure in terms of complex interacting themes related to how organizations respond to circumstances surrounding the information systems. In this model, organizational narratives that address culture, strategy, power blocs and dominant opinions are seen as the forces within which an information system is introduced. In terms of the CED Model of IS Project Management developed in this dissertation, this is recognition of the complexity of the discourse that is necessary in order that the constituency have an agreed way forward. As these narratives are adopted and discarded, alternative paths
of action can emerge, hence the change in the expectations. The model described here provides a way for the narrative debates to be conducted.

In bringing together the notions of expectations and discourse within a project constituency, the CED Model of IS Project Management described in this dissertation provides a framework within which the ideas of alternative models can be adapted in a pragmatic sense: to enable those concerned with initiating a new project to have a set of guidelines to follow. In terms of the model, an extension to the model shows that a refinement of the expectations into evaluation criteria is one use for expectations, as shown in Figure 7.4.

This use of expectations for deriving evaluation criteria is one use of expectations; using expectations as a source of measures for managing the project and as a way to scope the project are two others.

![Figure 7.4: Using Expectations as a Source of Evaluation Criteria](image)

*Project Management and Execution*

Using expectations as a source of measures for managing the project has been discussed at length earlier in the current chapter. In that discussion, the need to undertake a clarification of the expectations was identified, and in the context of the ongoing discourse discussed above, this need is satisfied. On the other hand, the process of
discourse to reach accommodation on the expectations implies that there is a continuing refinement of the expectations. This is the realisation of the ongoing change in the expected outcomes of the project, the opposite of the traditional call for stability in what the project is to achieve. Therefore, there needs to be recognition in the use of the measures that the underlying expectations may be in a state of continual change. The management of this change is another role of the communications coordinator.

Implicit in the expectations is the extent of the project, or the scope. In traditional IS project management terms, one of the first steps in a project is to agree a set of scope statements with the business owners, and for these to remain relatively stable during the project. In the model described here, the boundary becomes less rigid, changing to reflect the changing expectations. Again, it is unlikely that the original form of the expectations will adequately define the boundaries of the project, so some refinement activity will be required.

Given these two key uses of expectations in the project, the identification, clarification and refinement of the expectations becomes central to the conduct of the project. While the use of expectations in the derivation of measures was addressed earlier in this chapter, the means of refining expectations for deriving scope statements needs further exposition.

Current texts on IS project management offer little guidance on how to generate scope statements. Schwalbe (2002) assumes that it is an early stage of the project, but does not indicate a source. Hallows (1998) recommends the identification of major inputs and outputs, and implies that the user should be involved in the determination of these. Phillips (2002) defines the scope as defining the project deliverables and as a major baseline. Beyond recognising the “user” is involved in some way in defining the scope, none of these authors offer a process by which the scope can be defined so as to reflect the intent of all parties to the project. The CED Model of IS Project Management described in this dissertation provides a framework that is consistent with these admonitions, yet provides a way in which scope management is an integral part of the ongoing management of the project. There is a close relationship between the scope statements as derived from the expectations and the information shared by the members of the project constituency: the refinement process (and many other tasks associated
with the project) will require constant reference to shared understandings. Similarly, there will be a need for constant reference to the members of the constituency regarding the detail of undertaking the tasks associated with the project.

A related issue is how the project is managed. The traditional approach is to form a project team, comprised mainly of the system developers, lead by a project manager. In the description of the model in Chapter 5, the notion of a project management team was introduced, whose role is to oversight the project. In traditional project organizations, it is the steering committee (Hallows 1998), with additional responsibilities. The project management team comprises those members of the constituency who, through their knowledge or formal organizational positions, are in a position to influence decisions regarding the project. It reports to the organization executive, and has responsibilities regarding the internal working of the project, including budgetary and staffing responsibilities. The overall status of the project is one of the focus points for the project management team.

Day-to-day management of the tasks associated with the project is seen as the responsibility of a “task manager”, a peer of the communications coordinator who is responsible for the process of discourse. In traditional projects, the day-to-day tasks would be the responsibility of the project manager, but in IS projects the reality is that decisions regarding funding rest with the steering committee or other decision-making body.

In terms of the model, the use of expectations for project execution and management requires means of refining the expectations, and an extension to the model is shown in Figure 7.5.

*Project Governance*

The reports that were used as the basis of the meta-study were all produced by government bodies charged with the responsibility of protecting the public’s interest in government affairs. In these cases, reviews of IS projects were conducted to provide information to decision makers (including members of the government) on (particularly financial) aspects of the projects. In order to undertake this work, these bodies had considerable power to investigate the projects and the organizations undertaking them.
This external review of projects by such a body is an example of the need to differentiate between management and governance.

Figure 7.5: Using Expectations for Measures and Scope

The cases reviewed were all government projects, and in the tradition of open government, these reports are in the public domain (one reason why this type of project was selected for analysis). In the private sector, there is no such requirement for public disclosure, although the activity of reviewing major projects would be a matter of interest to auditors in the case of publicly listed companies. In both cases, there is a role for external review bodies with the authority to inquire into the conduct of the projects.

One of the issues that these reviews look at is the decision-making structure, and the use made of independent quality reviews. The major issues identified in the meta-study were the inadequate directions provided by the executive management and the
reluctance to take advice from the independent reviewers. In those projects where this was identified as an issue, the conduct of the project was compromised.

In terms of the CED Model of IS Project Management, these issues are interpreted as a failure to correctly assemble the constituency and establish the reporting relationships to those outside of the constituency. Using the revised definition of the project constituency described in an earlier section of this chapter, the model needs to cater for the situation where parties with an interest in the project have to remain independent of the project. In government projects, this may be mandated by legislation.

The issue of separating project governance from project management in the government sector has been addressed in detail by the New Zealand Controller and Auditor-General (Macdonald 2000). In his report, a clear distinction was drawn between these roles:

- Governance and oversight are undertaken by those with the authority to approve projects and the use of resources for those projects. Chief Executives, Ministers and Parliamentarians have a governance role.
- Management is about the delivery of projects. Project sponsors and project managers have a management role.

Successful projects occur when the specific accountabilities and responsibilities of the multiple players are formalised, understood and well executed. Likewise, projects fail when any or all of those responsibilities are not met.

In the past, oversight and governance has often been addressed by “ignore unless there is a problem”, then review and criticise. Active execution of oversight and governance responsibilities is as important as effective execution of management responsibilities.

From: Macdonald (2000), p21, emphasis in the original

These roles as envisaged by Macdonald (2000) are illustrated in Figure 7.6.

In Figure 7.6, the direct, legal accountability is clearly shown, and reflects the organizational lines of accountability. The steering committee is shown as being advisory to the project manager and project sponsor, however, in the day-to-day conduct of a project, it is usually the steering committee that effectively manages the project, as its recommendations usually carry considerable weight. The role of independent quality assurance is considered to be a management role, and is distinguished from the central agencies (such as audit offices) that provide oversight to the senior executive.

Both of these represent an organizational view of how projects are managed: the CED Model of IS Project Management presented in this dissertation is more concerned with the principles of how the project is constituted and managed. Individual
organizations will need to implement these principles within their existing organizational structures. Therefore, in a commercial organization such as the host organization for the action research project, there existed a project management office that had line supervision responsibilities of the project managers, and the business owners exerted their influence through the steering committee.

![Diagram of project governance and project management]

**Figure 7.6: Separating Project Governance and Project Management**

From: Macdonald (2000) p22

In terms of the principles for project management that is reflected in the CED Model of IS Project Management, the steering committee becomes a meeting of members of the project constituency, and is the highest decision-making body within the project. It reports to a senior executive who is part of the project governance structure. Independent quality assurance is seen as an external function (part of project oversight) as it needs to be able to express an opinion independently of the project. In this sense it
is similar to the central agencies shown in Figure 7.6. An extension to the model incorporating these ideas is shown in Figure 7.7.

**Figure 7.7: Governance and Oversight in The Model**

Figure 7.7 also shows how proxies are used instead of the governance and oversight groups in the project constituency. The purpose is to be able to represent the expectations of these groups without directly involving them, in order to better take the project forward. As an example, the government auditor cannot be part of the project, however, the expectations of the auditor in respect of audit controls, and adherence to government guidelines and adoption of prescribed standards should be incorporated into the set of expectations for the project. This is modelled by having proxies represent these expectations. Note that this is a role, not necessarily a person: if other members of the constituency have the necessary expertise, they can fulfil the role of proxies in addition to their other roles in the constituency (although any possible conflicts of interest have to be recognised and catered for).

**The Expanded Model**

This part of the chapter has looked at the implications for the CED Model of IS Project Management proposed in this dissertation in light of the research findings, and in comparison to other models and research. An expanded model that incorporates the extensions suggested by this discussion is shown in Figure 7.8. This Expanded
CED Model of IS Project Management can only reflect the basic features discussed, and act as a reminder of the interrelatedness of the concepts embodied in the model.

The indeterminacy of the expectations that result in changing measures, changing success criteria and changing project boundaries reflects the reality of many projects, as economic, political and internal forces cause change, especially in projects that cover a significant time period. What the Expanded CED Model of IS Project Management achieves is a way to control the changes, and provides a way to move the project forward, or provides a context within which to terminate the project: when the constituency cannot reach satisfactory accommodations. In conjunction with the redefinition of the way the project is managed, the importance of the role of knowledge manager thus becomes clear: to ensure that the process of discourse is pursued in order to reach an accommodation on the expectations, or, to identify when this is not likely to be achieved and institute appropriate action.

### 7.4 Reflections on the Research Methods

**Action Research**

Action research was chosen as the primary methodology for this research as the nature of the situation called for a methodology that would both enable the theory to be developed as part of the research and involve all concerned with the project. The environment for the research, an IS project in a commercial organization, meant that the research imperatives had to coexist with the business imperatives to complete the project. As the project unfolded, these two needs usually caused few concerns.

**The Five-Stage Iterations** The framework adopted (described in Chapter 3) identified five stages in each phase: diagnosis, planning, action, reflection and learning. Each of these stages had a defined purpose within the methodology, and the results presented in Chapter 4 used these stages as the framework for that discussion. However, it was not expected that each stage would be identifiable as a distinct event, and this subsequently proved to be the case.
There are two discernable reasons for this. Firstly, the nature of the research is such that the setting of the research (a commercial organization) predisposes the members of the organization to adopt their standard work practices. Secondly, the time frame of the project, together with the business pressures for timely completion, meant that advantage had to be taken of opportunities for saving time. In hindsight, neither of these features of the project proved to be detrimental to the research, rather the opposite was the case.

This research was essentially research-in-practice, that is, the value of the findings is based on the close correspondence of the theory development to actual practice. Every IS project is unique, and it is not possible to anticipate every situation that will occur during the life of a project. The goal is to be able to handle the issues as they arise. Any
theory of IS project management has to be able to cater for this diversity, and by having the theory emerge out of practice provides one way of ensuring that the need to be able to cater for diversity is satisfied. By its very nature, action research as a methodology provides the framework for this.

The members of the organization supported this research-in-practice approach. While the organization was committed to the research, there remained a focus on results that could be applied to their situation. This translated into practice that was centred on outcomes rather than process. This did not mean that the structure of the process was ignored, rather that the purpose of the process was considered more important than the execution of a series of predetermined steps: the situation dictated what was done. This caused the researcher to carefully examine (sometimes after the event) what had occurred, in order to ensure that the spirit of the methodology was not compromised. In the end, no particular stage of the five stages was totally ignored, and it was possible to analyse the project in terms of the five stages.

The second environmental feature is related to the time constraints of the project. While the project manager and the majority of his staff were engaged fulltime on the project, other members of the project planning group had other responsibilities. Meetings had to be scheduled well in advance, and as much achieved as possible in those meetings. While the agenda for each meeting addressed the stages as identified by the methodology, there was no attempt to use this as a mechanism to constrain the meeting or to curtail discussion. To do so may have resulted in lost opportunities to gain knowledge about the project. More importantly, there was a dynamic interaction discernable between the five stages, especially between a stage and its successor, such as between the planning and action stages. This resulted in what effectively was pre-validation of the stages in the context of the project.

This validation within the five stages resulted in a rich framework for understanding the methodology, and is illustrated in Table 7.1. In this table, the second iteration is used as the model, with strong interactions defined as being with a stage one step removed, medium interactions being defined as being with stages two steps removed, and weak interactions being defined as being with stages three steps removed. Interactions with stages more than three steps removed are not considered in this analysis.
<table>
<thead>
<tr>
<th>Primary Stage</th>
<th>Strong Interaction Stage</th>
<th>Medium Interaction Stage</th>
<th>Weak Interaction Stage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnosis</td>
<td>Planning</td>
<td>Action</td>
<td>Reflection</td>
</tr>
<tr>
<td></td>
<td>In attempting to understand the project in terms of the project management methodology being trialed (understanding the problem situation), scenarios are a useful means of moving towards a plan to further the project. In the diagnosis stage (of project phase 2), operational issues needed to be addressed, and several ways of addressing these were proposed in the meetings. Through scenarios that looked at impacts on the project plan, choices could be made based on the actual situation at hand.</td>
<td>Actual events that were to unfold could not be foreseen, but by drawing on experience from past projects, the scenarios referred to above had a degree of reality checking included in them.</td>
<td>The main benefit of this was to recognise the implications of choices made regarding alternative understandings of the project formed during the diagnosis stage. This provided information and insight that improved the understanding gained during the diagnosis stage.</td>
</tr>
<tr>
<td>Planning</td>
<td>Action</td>
<td>Reflection</td>
<td>Learning</td>
</tr>
<tr>
<td></td>
<td>In the context of the project, changes to the project plan (including additions) were made in light of what was happening at the time. Although it was acknowledged that events would not unfold exactly as planned, the planning was informed by practice.</td>
<td>This considered the implications of the changes to the plan in terms of the primary project goal (completion) and the research objective (evaluation of the project management methodology). Any changes to plans were assessed in these terms.</td>
<td>The planning process involved a deepening understanding of the methodology and its impact on the project, so at the point of planning, it was recognised that learning was in fact taking place.</td>
</tr>
<tr>
<td>Action</td>
<td>Reflection</td>
<td>Learning</td>
<td>Diagnosis</td>
</tr>
<tr>
<td></td>
<td>When carrying out the planned tasks (especially those directly related to the methodology, such as the production of the documentation) it was evident that a degree of analysis was taking place. This analysis was used to modify how the task was being performed.</td>
<td>While an analysis of what was learned occurred later, the project (and particularly the use of the methodology) was very much a learn-through-doing exercise. Thus, the process of learning commenced here.</td>
<td>Action can raise more issues that require addressing. In this second phase of the project, the completion of tasks opened up more possibilities for further work. An example from the documentation of the methodology was the question of the extent to which theory was...</td>
</tr>
</tbody>
</table>
There is a clear link between reflection and learning if reflection includes an increased understanding of the subject matter. In considering the use of the methodology and its impact on the project, it was evident that there was an increased understanding of each, and the interaction of methodology and the conduct of this project.

As understanding increases, there is an awareness of the need to consider how the issues raised can be addressed. In this project, consideration was given to how the project management methodology could be made accessible to other projects, that is, what the parameters were for this to take place.

Possible ways of addressing the issues relate to how the project plans could accommodate the alternative scenarios, that is, provide a reality check for possible courses of action.

In line with considering what the issues were to be addressed, how these would be incorporated into the project plan was being considered.

As discussions about what had been learned were taking place, how consequential issues could be addressed was also a consideration, albeit a minor one.

### Table 7.1: Revised Action Research Framework

<table>
<thead>
<tr>
<th>Reflection</th>
<th>Learning</th>
<th>Diagnosis</th>
<th>Planning</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>There is a clear link between reflection and learning if reflection includes an increased understanding of the subject matter. In considering the use of the methodology and its impact on the project, it was evident that there was an increased understanding of each, and the interaction of methodology and the conduct of this project.</td>
<td>The formal analysis of the lessons learned from the project phase raised a number of issues to be addressed, and in order to move forward, it is necessary to consider these issues in the context of the project. Therefore, a degree of understanding of the issues was being gained at the time that the learning phase was in progress.</td>
<td>As understanding increases, there is an awareness of the need to consider how the issues raised can be addressed. In this project, consideration was given to how the project management methodology could be made accessible to other projects, that is, what the parameters were for this to take place.</td>
<td>In line with considering what the issues were to be addressed, how these would be incorporated into the project plan was being considered.</td>
<td>As discussions about what had been learned were taking place, how consequential issues could be addressed was also a consideration, albeit a minor one.</td>
</tr>
</tbody>
</table>

From the above analysis of how each stage interacts with later stages, it is evident that the interaction model of action research is considerably more complex than five separate stages, with defined transitions between each stage. Elements of the activities and focus of all stages are evident in each separate stage, with the extent of the importance varying. So, while it is convenient to use the five stages as a framework for analysis and discussion, a more comprehensive model with interactions is shown in Figure 7.9.

This characterisation of the action research cycle highlights the importance of the interactions of the human participants in the process. This is supported in this research by the way in which the members of the project team and the project planning group in
particular interacted during the life of the project. It also reinforces the notion that action research is essentially a creative process involving people, and creativity for many people involves looking at many aspects of a situation: as an example, in this project it involved considering how to act when understanding the situation.

This model for action research also illustrates the difference between methodology and method. As used in this dissertation, methodology is defined as a set of guiding principles that are used as the framework for (in this case) the research. A similar definition is used for the project management methodology being trialed in this research, where the methodology specifies a set of principles to be followed for projects in general. A method is then the procedures used in a particular application. The model of action research illustrated in Figure 7.9 defines a set of principles, including the effective overlap of the stages, to differing degrees. In a particular project, such as this one, the realisation of the methodology is through what actually happened in the project, and these actual events constitute the methods for the project. The test is whether they are consistent with the methodology.

**The Three Project Phases** Over the life of the project, three iterations of the circle were identified, and as with the five stages of the circle, these iterations were not expected to be distinct. However three phases of the project were readily identifiable, and corresponded to timeframes identified in the project plan. From a methodological point of view, the issue arises as to whether these particular iterations were appropriate in the context of the project.

Action research as a research methodology is based in participation and collaboration as the basis for addressing problem situations. In this project, many people were involved, bringing with them a variety of expectations as to the outcomes of the project. These expectations ranged from the delivery imperatives of the project's business owners to research outcomes of the researcher. This variety shaped the way in which the project was conducted, and the way the learning iterations were conceived. By tacit agreement reached during the various meetings (especially at the start of the project) three major divisions of the timescale were seen as the most appropriate way of satisfying the variety of expectations. The main reasons for this number was the balance that had to be achieved between sufficient detail as reflected by the number of iterations and the
number of meetings that would result from the iterations. It was also agreed that the real
time spent on each iteration was sufficient to allow adequate time for reflection on the
progress of the project in the context of the methodology.

Figure 7.9: A Revised Model of Action Research in Information Systems
It is debatable whether it is possible or desirable to develop general principles for the number of iterations of the action research cycle that should be used in a particular application. The emphasis of action research on collaboration and learning means that the participants and their expectations will dictate the course of the research project, and this must be different for each project. To attempt to place constraints on the way the research project unfolds is antithetical to the philosophy of the methodology. While this project had three identifiable iterations, with different participants and in different circumstances a different number of iterations may be appropriate, but this needs to emerge as the project progresses.

Action research proved to be an effective way to use an IS project to understand and develop a methodology for managing IS projects. The focus on collaboration and learning enabled a theoretical base for the methodology to evolve from practice.

*Meta-Study*

The second part of the research study reported in this dissertation was a meta-study. This term has been used in the same way as in quantitative research: the analysis of existing studies to determine what information can be obtained from taking the studies as a set. In quantitative studies, statistical techniques have been developed as part of this higher-order analysis (Hunter, Schmidt and Jackson 1982, Rosenthal 1984, Glass, McGaw and Smith 1981), and applied to IS research (Chau 1999). In the qualitative research arena, there is less material to draw upon, although the principles are evident in literature surveys that seek to determine the common themes of bodies of related research. In this research, there has been a conscious attempt to adopt a set of methodologically sound methods: cases described from a similar perspective, a stated framework for the analysis and a consistent use of coding of the material.

As was discussed in Section 3.5 of this dissertation, examples of the rigorous application of meta-study to IS research were difficult to locate, so there is no precedent that can be used for comparison, either as to outcomes or in the application of the methodology. With this caveat in mind, I believe that the use of meta-study was an appropriate and powerful method for theory validation. It was an appropriate method as it enabled the use of data not used in the formulation of the theory-based model: a form
of triangulation. This data was in a form that required analysis techniques that supported interpretation and synthesis: meta-study provided these.

That the use of meta-study was a powerful method for this research is demonstrated by the complexity and rich inter-connectedness of the themes that emerged during the synthesis stage. The base data was prepared according to guidelines published by professional bodies (typically the National Audit Offices in collaboration with the peak accounting bodies of each country represented in the reports), so it is reasonable to assume that the quality of the data was high. Therefore, the emergent themes and their rich inter-connectedness have a validity grounded in professional practice. Meta-study enabled these themes to be identified in a consistent, repeatable manner.

The question then arises as to whether the same results could have been achieved by other research approaches. In the case where the research is not carried out until the project is essentially finished and been identified as a “failure”, one approach would be to interview personnel and examine project records in order to interpret events. The crucial point is who does the interpretation. As a research project, presumably it would be the researcher(s) who would carry out this task. However, the processes used by those writing the reports used in the meta-study reported in this dissertation would be similar, and possibly more comprehensive compared to research-oriented processes, given constraints of budget, time and political sensitivities that impact researchers. However, one area where specifically research-oriented processes may be of greater value is in the level of detail that could be used in the analysis stages of the research. Overall, meta-study based on independent, professionally prepared reports appears to be a sound research practice.

The use of meta-analysis (a term used by some authors rather than meta-study) has been recognised as a methodologically complex approach and a framework based on six levels of analysis has been proposed as a means of assessing the use of meta-analysis (Matarazzo and Nijkamp 1997, pp800-801), and these six levels are now used as a contrast for the four-step approach adopted in the research described in Chapter 6.

The real-world level. Social phenomena exhibit uncertainty due in part to the human behavioural content, and this variability may result in a complex set of issues that need to be considered. As has been argued elsewhere in this dissertation, IS projects are
inherently complex, human-centred activities, and there will of necessity be a large number of issues that will need to be taken into account in any attempt to detect any common themes. The use of qualitative methods of analysis presents the opportunity to both cater for these and to extract emerging commonality across the cases analysed.

The study level. This requires a consistent identification, definition and description of the problem space. In this research, the cases chosen all relate to the same type of project (government), and are all described from a common point of view (independent auditing bodies). This level also requires the formulation of a model as the basis of analysis: this research is based on a well-defined model prior to analysis.

The pre-meta-analysis level. It is necessary to define the units of study and the objectives of the study. In this research, the use of the model to explain the reported failure of IS projects was a clear objective for the research.

Study selection level. The cases chosen were obtained by searching for publicly available documents that satisfied the criteria of report source and report subject. While this limits the results to this class of studies, it does provide the necessary consistency across the studies in terms of focus of the report and the objective of the report.

Meta-analysis level. The use of a consistent qualitative analysis method (coding with theme emergence), gives the research a sound basis for reporting the results, as it enables cross-case results to be combined.

Implementation level. This is the re-application of the results to the real world, including the identification of new studies that are relevant to the problem being studied. The results of the analysis conducted in this research have been fed back into extensions of the model: further research is required to evaluate these extensions.

These six levels of analysis provide an alternative framework for evaluating the use of meta-study in this research. Using these levels of analysis, the research reported in this dissertation qualifies as being methodologically sound. The selection of cases, the use of a predefined model for analysis and the use of a consistent method for analysis represent sound practices as prescribed by the levels described above.
The “end result” of the meta-study was a set of themes that was used as the basis for evaluating the model of IS project management. The use of themes to understand the success and failure of IS projects is not well represented in the literature, however Fincham (2002) discusses the use of themes in understanding narratives related to IS projects: “Themes … have no plot or outcome … but are more about the dramatization of events and provide the interpretative link between stories and episodes.” (Fincham 2002 p5). Therefore, themes are used as the link between stories: the common set of ideas. In the context of looking to understand IS project success and failure, and to evaluate the model proposed, “success/failure more resemble generic themes that recur across different stories.” (Fincham 2002 p5).

Themes, and not explicit success and failure factors, emerge as the appropriate level of explanation for these projects. What is being sought are the common links that recur in projects, and from the research reported here, the themes of communication, involvement and participation emerge as credible linking ideas. These ideas are embedded in the theory-based model of IS project management described in this dissertation. It may be that thematic analysis is a more appropriate term for this type of research.

This use of themes to talk about IS project management may go some way to addressing one of the current issues in IS research: the accessibility of research finding to practitioners (Moody 2000), as illustrated in Figure 7.10. IS research that reports on the themes that emerge from examining a number of studies in a consistent way (as occurs in meta-study), and discussing the implications of these themes in terms of general practice (rather than reporting individual stories of project failure that may not be easily related to the needs of a particular project manager), enables knowledge gained from research to be made available in a concise, useful format.

From the discussion in this section, it is apparent that meta-study offers some promise as a research approach for IS researchers. By accessing high-quality, independent sources of data on matters related to IS and their use, IS researchers have the opportunity to expose and analyse complex situations, and be able to engage practitioners in a dialogue that both can benefit from.
7.5 Implications for IS Project Management

In Chapter 1 of this dissertation, the research agenda was stated as being:

To develop a people-centred methodology and supporting model for IS project management that increases the likelihood of project success.

This research agenda has been satisfied: the Expanded CED Model of IS Project Management has been developed and tested against a set of IS projects; a measures-based methodology for managing IS projects derived from this model has been defined; and this methodology has been confirmed in practice as contributing to improved IS project management.

The model developed in this dissertation represents a move from IS project management based on modernist managerialism to practice more suited to the knowledge economy. In making this move of perspective, the focus changed from a dominant task orientation, the hallmark of current practice, to a balance between tasks.
and people and their relationships. The necessity to undertake tasks in a consistent, disciplined manner has not been lost: however, this part of managing an IS project is now seen as a means to an end rather than an end in itself.

The Expanded CED Model of IS Project Management represents a consistent framework for managing IS projects, as it goes beyond explanation of why IS projects run into trouble. It provides a set of principles that can be used in conducting a project. The initial focus is on the composition of the constituency, and the model prescribes who should be members, including the need for proxy members. The key to a successful constituency lies in identifying the diversity of interests, and ensuring that all of the members can take part. While it is clearly impractical to literally involve everyone in every discussion and decision, uncensored two-way communication paths need to be established from the beginning. This represents a change from much current practice, where much smaller groups represent interests, with intermittent communication to those outside of these groups.

Once the constituency is established, the management teams need to be established. This represents another major change, as the model identifies a new role, a role responsible for conducting the discourse surrounding the expectations and managing the sharing of knowledge. In addition, a project management team manages the project, additional to the management of the tasks involved in realising the projects outcomes. Given the change to a focus on the expectations of the constituency, it would be expected that the technical bias evident in the projects analysed in this research would be counter-balanced by issues arising from the constituency in its explication of the project outcomes.

The explicit gathering of the expectations and their clarification through discourse and accommodation becomes one of the key steps in a project, with much of this work needing to be undertaken before the development activities that have traditionally been the “start” of an IS project commence. The project timeframe expands to include some time for the commencement of the refinement of the expectations. These expectations then provide a documented set for the development of the project scope, success criteria and the measures used in the day-to-day management of the project. The model ties previously loosely coupled elements together into one concept.
The Expanded CED Model of IS Project Management provides the basis for a set of methodologies, such as how to define expectations and derive scope statements, the reporting relationships of the management groups, and the day-to-day management of projects through the use of measures. This last methodology has been developed in this dissertation, and is a practical example of how the model can be translated into practical guidelines. By providing the necessary theoretical base, the model enables methodologies to be developed that are derived from a common philosophy, rather than be speculative and ad-hoc. In effect, the model provides a base against which to assess IS project management practice. Although the model has been developed from one action research project, a start has been made to validate it against other cases, supporting the implicit claim of generalisability (Lee and Baskerville 2003) of the model implied by applying it to IS project management practice.

7.6 Implications for IS Theory

Extending beyond the management of IS projects, the question arises as to what relationship the model developed in this dissertation has to the broader field of information systems theory. The debates about the foundations of the discipline are ongoing, however, the Expanded CED Model of IS Project Management developed here may contribute to theories of IS. Although explicitly targeted at one particular aspect of IS (projects), there are some elements of the model that can be used as a starting point to explore avenues for the development of theories concerned with IS. Prime among these elements are the constituency and expectations.

One aspect of the debate about IS is the social aspects, and in particular the relationship between people (including their social systems and beliefs) and technology. By framing the question in terms of the expectations of the organizational constituency of its systems, the Expanded CED Model of IS Project Management can be seen as providing the model for how these expectations are discovered, reconciled and used in the realisation of actual information systems. Thus, there is a possible parallel between project-specific expectations and organization-specific expectations, and the process of accommodation and management of a knowledge base may also have parallel application.
There is also an important relationship between the Extended CED Model of IS Project Management and systems science as applied to IS. Systems science is an approach to explaining the world based on an understanding of richly interconnected parts; a related concept, systems thinking, refers to discussions about these systems without necessarily adopting any particular paradigm (Flood 1990). The Extended CED Model of IS Project Management developed in this dissertation contains many features of systems thinking: for example, the model is both conceived of, and represented in, interconnected parts, each part may be examined in its own right yet the full meaning of the model is only apparent when the whole is assembled (the notion of emergent properties). A fundamental aspect of systems thinking is the use of systems-based methodologies.

As applied to management in general, Jackson (1991) identifies five variations of systems-based methodologies: organizations-as-systems (organisms), hard (technically oriented), organizational cybernetics (control theory), soft (interpretivist, cultural) and emancipatory/critical (exposing power relationships with a commitment to serving human interests). In relation to these varieties of systems methodologies, the Extended CED Model of IS Project Management recognizes both the importance of “hard” methodologies (as illustrated by the inclusion of accepted project management planning and control methods), as well as the “softer” methodologies (in the explicit recognition of people in projects). However, it is the last of the above system-based methodologies (specifically as incorporated in Critical Systems Thinking) that is singularly commensurate with the Extended CED Model of IS Project Management: the common adoption of a critical attitude. Critical Systems Thinking has been defined as having between three and five major commitments (or basic principles): critical awareness, emancipation and methodological pluralism (Midgley 1996), together with social awareness and acceptance of multiple systems theories and use of multiple systems methodologies (Jackson 1991, 2000), although the question of the implied primacy of methodology choice over argumentation and discourse has recently been questioned (Ulrich 2003).

A major contributor to Critical Systems Thinking has been emancipatory systems thinking, especially the Critical Systems Heuristics of Ulrich (1983), where the emphasis is on what should be done, rather than on how (the focus of hard or
mechanistic systems approaches). Thus, Critical Systems Heuristics is critical (exposes presuppositions and preconceptions), considers systems (looks the totality of relevant issues) and is based on heuristics (in that the setting helps to reveal the relevant features of the situation). In these three ways, the Extended CED Model of IS Project Management is aligned to Critical Systems Heuristics of Ulrich, exhibiting similar characteristics. In one sense the Extended CED Model of IS Project Management is one methodology for IS project management, yet as has been discussed in detail in Section 3.3 of this dissertation, the development of multiple methodologies for practically undertaking IS projects is supported. Therefore, there is no inconsistency between Extended CED Model of IS Project Management and Critical Systems Thinking insofar as its acceptance of multiple theories and methodologies is concerned.

This synergy between systems-based approaches and the Extended CED Model of IS Project Management provides a rich field for further research, as systems science has long been considered by many to be the basis for information systems (Xu 2000). Extending this body of knowledge to possibly include IS project management has the potential to further define the IS discipline.

### 7.7 Implications for Practice

The implications of this research for practice are significant. One of the stated aims of this research was to provide project managers with tools that would increase the likelihood of success. As discussed above, the Expanded CED Model of IS Project Management that supports the specific measures-based methodology implies several changes to practice, not the least being the mind set that needs to be brought to a project. In many organizations, this will represent a significant change to the management culture of the organization, and it may be that many organizations are not ready for the change. Therefore, a step-wise process to move from current practice to recommended practice is required.

The first step may be to change the management structures, by redefining the role of steering committees to formally recognise its responsibilities and to include an early version of the group responsible for identifying the expectations. Enabling sharing of expectations, and using the expectations to derive scope, success criteria and measures
is likely to be an easier task, as IS projects in particular are familiar with adopting procedures and guidelines.

However, a more profound change in fundamental management philosophy is implied by the theory: a move away from managerialism. Most current management training (including degree programs) adopt the managerialist approach to management, and in the project management field, this is reflected in the published *Bodies of Knowledge*. Until there is a degree of acceptance that alternative management philosophies may be more appropriate in some circumstances, adoption of the approach outlined in this dissertation is likely to be on a piecemeal basis. However, the Expanded CED Model of IS Project Management and derivative methodologies can be used to varying degrees within existing management approaches.

### 7.8 Further Research

Both the Expanded CED Model of IS Project Management and the specific measures-based methodology derived from it offer many areas for further research. There are four broad groupings: extending the ideas into the development of a theory of information systems, further refinement of the theoretical base of the model, the development of further methodologies derived from the model, and the refinement of the measures-based methodology. The notions of a constituency and their expectations are reflected in other disciplines besides information systems, so more theoretical development is possible. This would also be relevant to the model of IS project management. In all of these, the empirical evaluation of the Expanded CED Model of IS Project Management through practice remains as a high priority task.
APPENDIX A

Description of the Generalised Scorecard Methodology
In developing a project management model, I needed a starting point: an idea that could be adapted to IS project management to provide the starting point for the development of a model. In this initial stage, the focus would be on a methodology that could be used by practitioners. This appendix describes a methodology that is consistent with this aim, a methodology based on the measures used in the management of the project. As this methodology is based on the use of measures, Appendix D discusses in detail the use of measures in management. The starting point is the use of the project objectives as the basis for these measures.

The inspiration for the methodology described here was the Balanced Scorecard (Kaplan and Norton 1992, 1996) and similar managerial tools such as the Tableau de Bord (Lebas 1994). In the Balanced Scorecard, four perspectives (financial, customer, process and learning and growth) are used to identify the objectives for (especially) strategic planning within organizations. Taking the notion of perspectives (or points of view) in a more general sense than used in the Balanced Scorecard and applying them to the IS project management model, the first need is to generalise the four perspectives of the Balanced Scorecard into a structure that can be applied to essentially any management problem.

In implementing the balanced scorecard, additional perspectives have been proposed so as to define a scorecard that is focused on the particular needs of the developing organization (Olve, Roy and Wetter 1999). In making these extensions, the new or revised perspectives are particular to the application, and as such, do not generally display universality of application. The question that needs to be addressed is whether a set of general perspectives can be defined in such a way that application-specific sets can be derived. If a general set of perspectives can be defined, the opportunity exists to also have a set of general performance measures for each perspective, thereby offering the opportunity to establish a set of consistent performance measures across many applications.

The initial, tentative, general framework has seven perspectives. In proposing this set of perspectives, the focus has been on providing a framework that can be applied to as many situations as possible, and it is to be expected that alternatives will be proposed, as more insight is gained into the need and applicability of such a general set of perspectives. With each perspective is a typical question that can be posed to assist in the identification of appropriate performance measures, a subject that is addressed in more detail in the next section of this chapter. The set of general perspectives is shown in Figure A1.

The Stakeholder Perspective

The stakeholder level is the highest level, in that it represents the interests of the business, project or activity owner or sponsor. In a business context, this represents the shareholders, in projects, the project owner, in government, the minister (as representing the people) and so on. Thus, it may not necessarily involve purely financial measures (as in the Kaplan and Norton model), but the more general concept of ownership. Measures derived from this perspective are related to the goals of the stakeholder(s). Investors in companies will be interested in financial measures (both short term and longer term), whilst the public at large may require feedback on the extent to which a particular government department is fulfilling its social obligations (for example, job creation, medical standards, education, protection of the environment). On the other hand, a project manager charged with constructing a new information system, the measures are likely to be related to the value added to the business and the organization
overall, so will include value-related measures, market share measures and internal efficiency measures.

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Is the owner satisfied?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recipient</td>
<td>Are the objectives of the customer satisfied?</td>
</tr>
<tr>
<td>Process</td>
<td>Are the processes effective and efficient?</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>Are the resources managed effectively and efficiently?</td>
</tr>
<tr>
<td>Philosophy</td>
<td>Is everyone going in the same direction?</td>
</tr>
<tr>
<td>Knowledge</td>
<td>Are we learning from experience?</td>
</tr>
<tr>
<td>People</td>
<td>Are the staff equipped to do their job?</td>
</tr>
</tbody>
</table>

Figure A1: A General Set of Perspectives as the Basis of a Project Scorecard

The Recipient Perspective

The recipient level specifies the interests of the end recipient of the service or product, who may or may not actually pay for the product or service. In a business context, this may be those that buy the products or receive the services, in a project management environment, this may be the end users. In government, this may be the general population. The defining characteristic of this level is that performance measures of the clients are highly correlated to the performance measures at the stakeholder level in a cause and effect relationship. For businesses (whose stakeholder measures include financial measures), a link between profit, earnings, and similar measures and customer behaviour, as indicated by metrics such as customer satisfaction, product image and brand recognition, needs to be determined. For government sector organizations, measures for this perspective include education outcomes, community health measures, and similar end-user measures. Note that there is a subtle but distinct difference (particularly for government-related organizations) between measures for the stakeholder and recipient perspectives: at the stakeholder level, it is generally the community as a whole that is concerned with the outcomes, and as such is often set by the political agenda as expressed through the ballot box, whereas the recipient
perspective is focused on the sector of the community that is affected by the policy or program.

*The Process Perspective*

The process level includes those activities that are immediately apparent or affecting the clients. In the business context, this may include the production lines, service departments, design shops, and so on, whilst in the government context, it includes services such as health care providers and social service shopfronts. In the information systems project management arena, it is the actual activities related to the project, including requirements gathering, database design, code generation, testing and implementation. Again, the defining characteristic is that activities at this level directly affect and are correlated to the client level. In the Kaplan and Norton business model (Kaplan and Norton 1992), this corresponds to the process level. Measures for this perspective derive from such considerations as effectiveness of delivery, quality, responsiveness and efficiency.

*The Infrastructure Perspective*

The infrastructure level addresses the resources available to the organization, business, or project to accomplish its goals. Included here are the information systems assets, plant, equipment, people and so on. While the process level looks at how the products and services are produced, the infrastructure addresses the adequacy or otherwise of the resources that are available for the processes. By separating infrastructure from process, the need for effectiveness at infrastructure provision is highlighted as an important issue. As with all of the perspectives, relationships exist between the perspectives, and the link between infrastructure and process is strong. Examples of the measures that can be applied to this perspective include measures of technological suitability, location of resources, and maintenance and replacement regimes.

*The Philosophy Perspective*

The philosophy perspective deals with the underlying ideas, principles, procedures and rules that are used as the basis for using the infrastructure in the operations of the organization, business or project. This perspective rests on the assumption that successful businesses, organizations and projects are the result of sound practices that are well documented, communicated and followed. Therefore, the measures at this level reflect the rigour, level of documentation and extent of understanding of the rules and procedures in place. The assumption is that effective use of the infrastructure in its operations stems from relevant rules and procedures at this level. By proposing this perspective, it is not asserted that all organizations need a rigid methodology or set of procedures and rules. To the contrary, and as for all of the framework perspectives, a particular perspective is included for a particular application only if it can add value. Thus, whilst medical establishments will need to establish, communicate and enforce safe working practices, a small community organization will have little need for formal procedures. However, the important point is that the importance of the perspective needs to be considered, and not assumed to be of little importance.

*The Knowledge Perspective*

The next perspective is that of knowledge, and reflects the skills, organizational memory, expertise and information base of the organization. In its simplest form, it represents the extent to which the organization knows what it is doing. In its richest form, it represents the collective information available to progress the aims of the
organization. There is much current activity in the area of knowledge management, and this work is of direct relevance to this perspective. Traditionally, the measurement of the knowledge perspective has been related to data and information storage effectiveness and accessibility, and these measures are relevant. However, organizations are beginning to appreciate that a significant amount of the knowledge possessed and used by an organization is not represented in these systems, and that new knowledge representation, storage and communication frameworks need to be developed. Therefore, an important measure for this perspective is the extent to which an organization has progressed to becoming a knowledge-based organization.

The People Perspective

The most basic level is that of people. At this level, due recognition is given to the value of people to the organization, and may be reflected in morale, corporate wisdom, unofficial communication networks, and so on. It is possible to combine this perspective with the knowledge perspective, yet to do so would remove the visibility that people deserve to be afforded within an organization. Measures applicable to this perspective are focused on the individual, in the sense that changing performance figures for this perspective will involve altering individual characteristics (such as levels of training) or collective characteristics (such as morale).

Using the Meta-Perspectives

The initial set of objectives is identified from the project scope, and the meta-perspectives are used to identify the objectives that might have been overlooked in this step. The next step is to pose a series of questions that lead to measures. The process of identification of measures is similar to the Goal-Question-Metric (GQM) framework (Abdel-Hamid, Sengupta and Sweet 1999, Basili 1992, Basili, Caldiera and Rombach 1994, Fuggetta, Lavazza, Morasca et al. 1998, Sylaidis, Nanakis and Kopanas 1997, van_Latum, van_Solingen, Oivo et al. 1998) that is used to identify metrics that can be used to assess whether goals (such as production targets) have been met. In the context of IS project management, the basic concept is to move from objectives to questions to measures. The process involved in this step is, for each objective, to pose a series of questions, which, if answered, enable a judgement to be made as to whether the objective has been met. Further, each question should if possible be posed in terms of observable features of the project, such as behaviour, interaction, or tasks completed, meetings held and training courses conducted. The aim of this step is to identify a set of variables that measure some feature of the project, and that have a role to play in judgements regarding the meeting of objectives.

The next and final step of the methodology is to select from among the many measures identified in the previous step those that are *most relevant* to the project at hand. The term "most relevant" is used to acknowledge that reality dictates that not all measures identified can actually be measured or should be measured. In effect, the selection of measures to be used is a benefit-cost trade-off: so much time and money may be expended in measurement that no actual work is completed. The consequences identified in the first step are used to assist in the selection of those measures to be used: outcomes that have significant consequences (positive or negative) are candidates for measurement before others with lesser consequences. It should also be noted that the same measure might satisfy more than one outcome, possibly indicating a more useful measure. Also, some measures arising from the questions may not be directly measurable: in this case, indirect measures may be needed.
The final issue to be discussed is that concerning process and result measures, and how the methodology identifies these types of measures. As discussed above, the framework used to elicit outcomes is based on the Balanced Scorecard (Kaplan and Norton 1992, 1996). The Balanced Scorecard defines a set of perspectives that call for a focus on performance in strategic areas in addition to the financial area – the customer, process and learning and growth perspectives. By establishing a cause-and-effect chain between activities in the various perspectives, it is possible to develop a set of performance indicators that changes the focus of the manager away from the lag indicators described above, to lead indicators – performance measures that, if they are favourable, can point to success in the future. For example, by establishing a causal link between a corporate knowledge base, the processes dependent on this knowledge base, the customers who are the beneficiaries of these processes and the ultimate financial performance, then the success in establishing a corporate knowledge base is demonstrated to be positively correlated to future financial success. By identifying the key performance measures for an organization, and establishing the cause and effect chain, some degree of confidence will exist in predicting future performance based on the full set of performance measures.

References


APPENDIX B

Results of Analysis of Objectives
<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Business Owner</th>
<th>Efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Goal</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Has the efficiency of the CC been improved?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Completeness of Facilities Plan (Note 1)</td>
<td>Project report</td>
<td>Weekly</td>
</tr>
<tr>
<td>Quality of Facilities Plan</td>
<td>Review by external parties</td>
<td>Monthly</td>
</tr>
<tr>
<td>Comparisons to industry benchmarks</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Economic Leverage</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Will the economic advantages of moving to CC be maintained?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Completeness of Economic Leverage Plan (Note 2)</td>
<td>Project report</td>
<td>Weekly</td>
</tr>
<tr>
<td>Quality of Economic Leverage Plan</td>
<td>Review by external parties</td>
<td>Monthly</td>
</tr>
<tr>
<td><strong>Timely Delivery of CC</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Will the CC be operational on time?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Degree of adherence to project plan</td>
<td>Project report</td>
<td>Weekly</td>
</tr>
<tr>
<td><strong>Recipients</strong></td>
<td>Users (CC Staff)</td>
<td>Ease of Use of Site</td>
</tr>
<tr>
<td><strong>Goal</strong></td>
<td></td>
<td>Is the CC supportive of efficient practices?</td>
</tr>
<tr>
<td>Architectural / ergonomic quality of site</td>
<td>Review by external parties</td>
<td>Monthly</td>
</tr>
<tr>
<td><strong>Training</strong></td>
<td></td>
<td>Are the staff adequately trained?</td>
</tr>
<tr>
<td>Completeness of Training Plan</td>
<td>Project report</td>
<td>Weekly</td>
</tr>
<tr>
<td>Completeness of training in detail</td>
<td>Project report</td>
<td>Weekly</td>
</tr>
<tr>
<td>Completeness of training of initial staff</td>
<td>Project report</td>
<td>Weekly</td>
</tr>
<tr>
<td><strong>Supportive Technology</strong></td>
<td></td>
<td>Does the technology support the work practices of the staff?</td>
</tr>
<tr>
<td>Assessment by staff of quality of systems</td>
<td>Survey</td>
<td>Monthly</td>
</tr>
<tr>
<td><strong>Process</strong></td>
<td>Project Execution</td>
<td>Adherence to time frames</td>
</tr>
<tr>
<td>Infrastructure Philosophy</td>
<td></td>
<td>Is the project plan complete and being monitored?</td>
</tr>
<tr>
<td>Completeness of project plan</td>
<td>Project report</td>
<td>Weekly</td>
</tr>
<tr>
<td>Adherence to reporting schedules</td>
<td>Project report</td>
<td>Weekly</td>
</tr>
<tr>
<td>Degree of adherence to project plan</td>
<td>Project report</td>
<td>Weekly</td>
</tr>
<tr>
<td>Are outstanding action items being cleared in a timely manner?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average time to close action items</td>
<td>Project report</td>
<td>Weekly</td>
</tr>
<tr>
<td>Number of outstanding action items</td>
<td>Project report</td>
<td>Weekly</td>
</tr>
<tr>
<td>Knowledge</td>
<td>Project Staff</td>
<td>Skillset</td>
</tr>
<tr>
<td>-----------</td>
<td>---------------</td>
<td>----------</td>
</tr>
<tr>
<td>People</td>
<td>Project Report</td>
<td>Adherence to training plan</td>
</tr>
</tbody>
</table>

**Notes**

1. The Facilities Plan covers the establishment, use and ongoing maintenance of the physical infrastructure.
2. The Economic Leverage Plan covers the items that initiated the move to _____ including the availability of lower-cost staff. The plan should address how these factors will continue to be a positive for the overall operation of the call centre, e.g., how staff will be recruited and retained.
APPENDIX C

The Final (Complete) Set of Measures
## Project Perspectives / Metrics Derivation

<table>
<thead>
<tr>
<th>Perspective</th>
<th>Goal</th>
<th>Question</th>
<th>Metric</th>
<th>Data Source</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management</td>
<td>Efficiency</td>
<td>Has the efficiency of the CC been improved?</td>
<td>Completeness of Facilities Plan</td>
<td>Status update</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Quality of Facilities Plan</td>
<td>Review</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Comparisons to industry/other areas or benchmarks</td>
<td>kPI reports from Enterprise, ADBI, AA</td>
<td>1</td>
</tr>
<tr>
<td>Economic Leverage</td>
<td>Will the expected economic advantages of moving to be maintained?</td>
<td>Completeness of Benefits Realisation Plan</td>
<td>Status update</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Quality of Benefits Realisation Plan</td>
<td>Review</td>
<td>2</td>
</tr>
<tr>
<td>Timely Delivery of CC</td>
<td>Will the CC be operational on time?</td>
<td>Degree of adherence to project plan</td>
<td>Team meeting</td>
<td>weekly</td>
<td></td>
</tr>
</tbody>
</table>

### Internal and External End-Users

To at least maintain existing levels of end-user satisfaction during transition

Have established KPIs been met?

- KPI Analysis
- Have appropriate new KPIs been established?
  - Completeness of Benefits Realisation & SL Targets Plans
  - Quality of Benefits Realisation & SL Targets Plans

Productive Work Environment

Is the CC design supportive of efficient practices?

Architectural / ergonomic quality of site.

Training

Are the staff adequately trained?

- Completeness of Training Plan
- Quality of training material
- Completeness of training of initial staff

Effective and Efficient Tools

Does the technology support the work practices of the staff?
Assessment by staff of functionality of systems

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Business Process</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of outstanding action items</td>
<td>project database</td>
<td>weekly</td>
</tr>
<tr>
<td>Number of late action items</td>
<td>project database</td>
<td>weekly</td>
</tr>
<tr>
<td>Have issues been identified, allocated to owner and reviewed?</td>
<td>project database</td>
<td>weekly</td>
</tr>
<tr>
<td>To proactively manage project risk</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is the Risk Mitigation Plan current, complete and being monitored?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Completeness of Risk Mitigation Plan</td>
<td>review status updates</td>
<td>monthly</td>
</tr>
<tr>
<td>Quality of Risk Mitigation Plan</td>
<td>review status updates</td>
<td>monthly</td>
</tr>
<tr>
<td>Degree of adherence to risk mitigation task list</td>
<td>status updates</td>
<td>monthly</td>
</tr>
<tr>
<td>Frequency of Risk Plan review</td>
<td>meeting minutes</td>
<td>monthly</td>
</tr>
<tr>
<td>To ensure that changes to scope are properly costed, sized and assimilated</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is the Change Management Plan current, complete and being monitored?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Completeness of Change Management Plan</td>
<td>review</td>
<td>monthly</td>
</tr>
<tr>
<td>Quality of Change Management Plan</td>
<td>review</td>
<td>monthly</td>
</tr>
<tr>
<td>Number of raised changes</td>
<td>project database</td>
<td>monthly</td>
</tr>
<tr>
<td>To ensure that the Technical Infrastructure Configuration meets industry best practice</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are the design elements based on industry best practice?</td>
<td>design review</td>
<td>1</td>
</tr>
<tr>
<td>To ensure that external service providers conform to contract conditions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are the contracts complete?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quality of external service provider contracts</td>
<td>legal &amp; business expert review</td>
<td>2</td>
</tr>
<tr>
<td>Are contract deliverables being monitored?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>External service provider task completions</td>
<td>status updates</td>
<td>weekly</td>
</tr>
<tr>
<td>To ensure that adequate facilities are available for project staff</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Have all required facilities been provided?</td>
<td>plan reviews</td>
<td>2</td>
</tr>
<tr>
<td>Number of outstanding infrastructure items</td>
<td></td>
<td></td>
</tr>
<tr>
<td>To create operational documentation for CC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is the documentation being created according to schedule and of the required quality?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adherence to task completion schedule</td>
<td>status updates</td>
<td></td>
</tr>
<tr>
<td>Quality of operational documents</td>
<td>reviews</td>
<td></td>
</tr>
<tr>
<td></td>
<td>fortnightly</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 each</td>
<td></td>
</tr>
</tbody>
</table>

**Project Staff**

- To ensure that all project team members have “bought in” to the project
  - Do project staff exhibit pro-project attitudes?
  - Ratio of positive vs negative comments
- To ensure that the members of the project team have appropriate skills
  - Do the project members have the correct skills?
- Currency of skills audit
- Adherence to training plan
- To ensure that members of the project team remain motivated
  - Are the contributions of team members appropriately recognised?
  - Proportion of team receiving awards
- team meetings, hr
- monthly

- survey project staff
- role description and skill review
- when staff appointed weekly when training starts
- status updates
- team meetings, hr
- monthly
APPENDIX D

The Role of Measures in Project Management
**Introduction: The role of measures**

The project organization has been proposed as an effective method of organising tools, materials and methods to achieve defined objectives in a defined timeframe. At the heart of the project organization is the desire to actually get something accomplished: to undertake a series of tasks in order to achieve the previously defined objectives. We thus have the notion of projects having as their primary focus the *production* activity: the performance of a set of tasks to produce the required output as defined by the objectives. Functionality, time and cost are the key performance measures in this view, and research has looked at the factors that impact these measures (for example, Yetton, Martin, Sharma et al. 2000). These measures are also used during the project for managing the progress, although there has been research undertaken to include more non-financial measures (for example, Lopes and Flavell 1998, Rivers 1999).

The bases of the management of the production tasks are the lifecycle models and project management methodologies that are articulated in texts on project management, and embodied in the *Bodies of Knowledge* of the various professional project management associations (Project Management Institute 2000, Association for Project Management 2000). At their centre lay the classical management concepts of planning, acting and monitoring, with the first of these acknowledged as a key step towards a successful project. During the project, status reports, budgets, schedules and meetings are used as control mechanisms. With an often unstated assumption that there will be no major unforeseen events during the project, the purpose of these controls is primarily for scheduling: the allocation of resources to tasks as they become due for action according to the plan. Thus, in this environment, the project manager’s main role is to action the plan prepared previously: if the plan is followed, the project will finish successfully.

Various lifecycle models provide the larger framework: how will the product be delivered (all at once or piece by piece), what will be delivered (physical artefacts) and the steps required (problem analysis, option generation, selection and build). In this scenario, the role of monitoring during the project assumes the role of confirming that all is on track, and that the next tasks can be started according to the plan. (Note that the assumption of no major unforeseen events does not preclude *variability* during the execution of the plan – for example, staff absences would not be considered as ‘unforeseen’, but it would be assumed that other staff can be recruited or reassigned to cover such events.) In this somewhat ideal project world, the measures used to monitor the project do not need to be complex: tasks completed, budget reports, test results. The project manager has time to react, as presumably the problems are of a minor nature, and can be solved in a straightforward manner in line with the project plan. This type of project does exist in some industries: the building of project homes comes to mind (done many times before so strategies for handling variations are well understood, known materials, a flexible labour pool). However, this type of project is not typical of information systems projects, with their inexact requirements and variety of people involved. These information systems projects face real problems when measures designed for much simpler projects are used to manage unforeseen circumstances and people-related issues.
Systems theory, process and results measures

Systems theory (see, for example, van_Gigch 1974) is concerned with constructing the whole from the parts, or, any system can be decomposed to finer and finer levels of detail. In this way, complex systems can be analysed and understood. New systems can be similarly constructed from the parts. This approach is particularly applicable to information systems, in that increased complexity is built up from simple routines. Code fragments are combined to assemble the whole. Attributes are assembled into databases.

In the standard feedback model of a system (see Figure B1), the output is measured, compared to the expected outputs (or goals), and if a discrepancy is detected, a change made to the inputs in order to influence later output. In this view of a system, the system itself is viewed as a black box, that is, its internal workings are unknown. In terms of IS project management, it is possible for a project manager to view processes (that is, systems) as black boxes: for example, the process of requirements elucidation can be managed by making a judgement of the completeness and quality of the requirements documentation, and controlling this documentation by providing more analysts or seconding more user representatives – all of these are inputs to the process.

An often-used variation to the black box view of systems is to allow variations to the process inside of the black box, that is, change the internal processes (see Figure B2). In this variation, a comparison of the outputs against goals results in both changes to the inputs, and alterations to the internal processes. In the example of requirements elucidation, this may correspond to adding an additional review step during the writing of the requirements documentation. This extended model of the feedback system used in IS project management can be related to the plans that form the mainstay of the control system commonly used: the project plan that is based around tasks and milestones. To continue with the above example, the requirements elucidation phase will typically be broken down into a number of tasks, each addressing some aspects of the functionality of the target system. As each of these tasks is completed, changes will be possibly be made to similar tasks, both as adjustments to inputs (more user involvement), or to the process used (more internal reviews).

Figure B1: A Simple Feedback System

From the above discussion, it is evident that the feedback model has some shortcomings, depending on the validity of underlying assumptions. However, there is an alternative model: the feedforward model. This model uses internal measures from the system as the basis for control of the processes within. In this model, the internal processes are monitored (that is measured) and these measures used as triggers to modify those same processes. Returning to the example from an IS project, this may be
the monitoring of user interactions during the requirements elicitation phase, and using this information to improve this part of the overall process. The essence of this model is that these internal measures are deliberately made visible outside of the process, and actively used to manage the system. This visibility has a major implication for time, in that adjustments to the process are made as the process is running. Compare this to the feedback model, where adjustments are not made until after the event. In terms of IS project management, the focus is changed from monitoring the end product of a task, to monitoring how the task is being performed. For example, it is concerned with the process of testing, not the results of testing.

As with the feedback model, there are assumptions underlying the feedforward model. The assumption of initial suitability of process still applies, however, with the focus now on changing process as events happen, rather than at some later time, the capacity to alter processes dynamically is enhanced. Nevertheless, the initial process does need to be appropriate so that major adjustments are not required: to have to so is likely to impact the project plan.
More generally, four conditions are required to be met before a process can be said to be controlled (Otley and Berry 1980):

- Objectives for the system must be specified
- Measurements must be possible
- A model of expected output must exist
- Alternative courses of action must be available

A control system satisfying these requirements is shown in Figure B3, from Ottley and Berry (1980, p236). These principles have been used to design performance measurement systems in contemporary organizations, where result and process measures are explicitly defined and used for proactive management (deHaas and Kleingeld 1999). A model for IS project management based on system theory, and feedback and feedforward measures is shown in Figure B4 (adapted from deHaas and Kleingeld 1999, p244).

![Figure B3: A Control System](From Ottley and Berry 1980, p236)

As shown in Figure B4, two types of measures emerge: process measures, and results measures (Hronec 1993). The former is concerned with measuring what is happening within the black box, and are used to change how processes are operated. This is in order to affect the results measures, which are measures of the result of the processes in the black box. Traditional project measures have been concerned with results measures, however, process measures can be used to improve quality.
Figure B4: Feedforward Model with Process and Results Measures
(adapted from de Haas and Kleingeld 1999 p244)

The link to quality

The focus on internal process measures has been adopted in several management approaches over the last few decades, and is known by several names. The Japanese management approach known as KAIZEN embodies this idea (Imai 1986). The theme of KAIZEN is improvement in processes, “since processes must be improved before we get improved results” (Imai 1986, p16). This thinking produces a clear distinction between process-oriented measures (improvement) and results-oriented measures (productivity).

A similar approach (again from Japan) is hoshin kanri, or target-means deployment (Akao 1991). This approach separates the “what” from the “how”: what to achieve is seen as being answered by result-focused measures, whereas the question of how to achieve these results is answered by process-focused measures. Total Quality Management (TQM) can also be analysed from the perspectives of two types of measures (Zairi, 1994). Software quality has been shown to be linked to process improvements (Ravichandran and Rai 2000). Quality can be characterised as negative (minimum levels) or positive (customer driven). Negative quality is seen as reactive, and based on (quality) measures on output. On the other hand, positive quality is about customer expectations and is proactive, focusing on process.

Vertical management

So far in this discussion of measures, the focus has been on horizontal processes, that is, on measures related to processes that follow one another, as in measuring the completion of one task (in terms of its output) in order that later, dependant tasks may commence. The argument has been made that internal measures, or process measures (derived from a feedforward model) are more appropriate for managing within task, as this allows timely adjustments to processes in order to produce the required output. However, the result measures are appropriate for control purposes between tasks, as
there is a need to coordinate processes. The result measures can also be used for vertical control, that is, for control purposes related to higher levels of management, such as for project steering committees (deHaas and Kleingeld 1999).

Therefore, both types of measures have their place in IS project management. The process controls provide a means for proactively managing projects, focused as they are on events as they occur, with the aim of producing product that is right first time. The product is managed through result measures, which are used for overall process control, and for vertical reporting. Result measures fall into two categories: short term and long term, and these are sometimes at odds with one another. For example, a short-term result measure may be adherence to the project budget, and a project may score well on this criterion; long-term measures may be related to the ongoing contributions that the system is making to the organization. By compromising delivered functionality in order to meet the short-term measure, the long-term measure may be adversely affected. This need to consider both long and short-term measures (especially in relation to financial measures) has been a topic of interest in the management accounting discipline for some time (Johnson and Kaplan 1991). It is necessary that a balance be struck between short term and long-term measures.

**Summary**

This discussion has concentrated on the types of measures that can be used in IS projects: process measures and results measures. The former are concerned with proactively managing quality, the latter for vertical management. Both have an important role in managing IS projects.

Two final observations can be made about the use of measures in the management of projects. Firstly, the proactive management of projects by the use of signals from the environment (Ansoff and McDonnell 1990) has been shown to improve project outcomes (Nikander and Eloranta 1997, 2001). The measures available in the project context may contain similar information, so assisting in identifying future problems. The second observation is that not all of the measures are open to change, that is, some of them may be unable to be changed. It is therefore important to concentrate on those measures that can be used to change the processes, the so-called "malleable variables" (Majchrzak 1984).

**References**


APPENDIX E

Sample Questionnaire

This appendix contains a sample of the questionnaire distributed to the project managers of the client organization. Note that preliminary material relating to the purpose of the questionnaire and the participant authority form have been omitted.
Section A

A1. If you have post-secondary qualifications (e.g., a TAFE Diploma), what is the title and specialisation of this/these qualifications?
[Example: Diploma in Networking, Associate Diploma in Accounting]
Type response here>

A2. If you have an undergraduate degree, what discipline(s) did you major in?
[Examples: marketing, accounting, computer science, economics]
Type response here>

A3. If you have post-graduate qualifications, what is the title and specialisation of this/these qualifications?
[Example: Master of Commerce (Finance)]
Type response here>

A4. Have you had any training (external or in-house) specifically on project management? Give details such as provider(s), length of course(s), focus of course(s), qualification gained.
[Example: PMIA course, 5 days, IT project management, Certified Project Manager]
Type response here>

A5. Using “responsibility for resource and task scheduling” as a definition of project management, how many years experience do you have? Use the indicated categories as approximate guidelines.
Small: less than six months duration, less than five project team members: _____
Medium: six – eighteen months duration, 5 – 10 project team members: _____
Large: longer than 18 months, more than 10 project team members: _____

A6. What type of project were these?
[Example: business process re-engineering, IT system development]
Type response here>

A7. Prior to being appointed as a ‘project manager’, what was your work background, and for what period(s) of time?
[Example: Accountant, 6 years; Internal Audit, 3 years]
Type response here>
Section B

In this section, it is your opinion and perceptions that are important.

In answering these questions, use the following definitions:
-3 Strongly Disagree
-2 Disagree
-1 Slightly Disagree
0 No Opinion
+1 Slightly Agree
+2 Agree
+3 Strongly Agree

To record your answer, place the cursor on the line underneath the scale and type any character.

Example:

Today is a nice day for a walk.

[  -3  -2  -1   0  +1  +2  +3  ]

B1. My company recognises the need for project management. This need is recognised at all levels of management, including senior management.

[  -3  -2  -1   0  +1  +2  +3  ]

B2. My company has a system in place to manage both cost and schedule. The system requires charge numbers and cost account codes. The system reports variances from planned targets.

[  -3  -2  -1   0  +1  +2  +3  ]

B3. My company has recognised the benefits that are possible from implementing project management. These benefits have been recognised at all levels of management, including senior management.

[  -3  -2  -1   0  +1  +2  +3  ]

Appendices 25
B4. My company (or division) has a well-defined project management methodology using life cycles.

<table>
<thead>
<tr>
<th>Disagree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>-3</td>
<td>+3</td>
</tr>
<tr>
<td>-2</td>
<td>+2</td>
</tr>
<tr>
<td>-1</td>
<td>+1</td>
</tr>
</tbody>
</table>

B5. Our executives visibly support project management through executive presentations, correspondence, and by occasionally attending project team meetings/briefings.

<table>
<thead>
<tr>
<th>Disagree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>-3</td>
<td>+3</td>
</tr>
<tr>
<td>-2</td>
<td>+2</td>
</tr>
<tr>
<td>-1</td>
<td>+1</td>
</tr>
</tbody>
</table>

B6. My company is committed to quality up-front planning. We try to do the best we can at planning.

<table>
<thead>
<tr>
<th>Disagree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>-3</td>
<td>+3</td>
</tr>
<tr>
<td>-2</td>
<td>+2</td>
</tr>
<tr>
<td>-1</td>
<td>+1</td>
</tr>
</tbody>
</table>

B7. Our lower- and middle-level line managers totally and visibly support the project management process.

<table>
<thead>
<tr>
<th>Disagree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>-3</td>
<td>+3</td>
</tr>
<tr>
<td>-2</td>
<td>+2</td>
</tr>
<tr>
<td>-1</td>
<td>+1</td>
</tr>
</tbody>
</table>

B8. My company is doing everything possible to minimise “creeping” scope (i.e., scope changes) in our projects.

<table>
<thead>
<tr>
<th>Disagree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>-3</td>
<td>+3</td>
</tr>
<tr>
<td>-2</td>
<td>+2</td>
</tr>
<tr>
<td>-1</td>
<td>+1</td>
</tr>
</tbody>
</table>

B9. Our line managers are committed not only to project management, but also to the promises made to project managers for deliverables.

<table>
<thead>
<tr>
<th>Disagree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>-3</td>
<td>+3</td>
</tr>
<tr>
<td>-2</td>
<td>+2</td>
</tr>
<tr>
<td>-1</td>
<td>+1</td>
</tr>
</tbody>
</table>

B10. The executives in my organisation have a good understanding of the principles of project management.

<table>
<thead>
<tr>
<th>Disagree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>-3</td>
<td>+3</td>
</tr>
<tr>
<td>-2</td>
<td>+2</td>
</tr>
<tr>
<td>-1</td>
<td>+1</td>
</tr>
</tbody>
</table>
B11. My company has selected one or more project management software packages to be used as the project tracking system.

<table>
<thead>
<tr>
<th>Disagree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>-3</td>
<td>+1</td>
</tr>
<tr>
<td>-2</td>
<td>+2</td>
</tr>
<tr>
<td>-1</td>
<td>+3</td>
</tr>
</tbody>
</table>

B12. Our lower- and middle-level line managers have been trained and educated in project management.

<table>
<thead>
<tr>
<th>Disagree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>-3</td>
<td>+1</td>
</tr>
<tr>
<td>-2</td>
<td>+2</td>
</tr>
<tr>
<td>-1</td>
<td>+3</td>
</tr>
</tbody>
</table>

B13. Our executives both understand project sponsorship and serve as project sponsors on selected projects.

<table>
<thead>
<tr>
<th>Disagree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>-3</td>
<td>+1</td>
</tr>
<tr>
<td>-2</td>
<td>+2</td>
</tr>
<tr>
<td>-1</td>
<td>+3</td>
</tr>
</tbody>
</table>

B14. Our executives have recognised or identified the *applications* of project management to various parts of our business.

<table>
<thead>
<tr>
<th>Disagree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>-3</td>
<td>+1</td>
</tr>
<tr>
<td>-2</td>
<td>+2</td>
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<td>+3</td>
</tr>
</tbody>
</table>

B15. My company has successfully *integrated* cost and schedule control for both managing projects and reporting status.

<table>
<thead>
<tr>
<th>Disagree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>-3</td>
<td>+1</td>
</tr>
<tr>
<td>-2</td>
<td>+2</td>
</tr>
<tr>
<td>-1</td>
<td>+3</td>
</tr>
</tbody>
</table>

B16. My company has developed a project management curriculum (i.e. more than one or two courses) to enhance the project management skills of our employees.

<table>
<thead>
<tr>
<th>Disagree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>-3</td>
<td>+1</td>
</tr>
<tr>
<td>-2</td>
<td>+2</td>
</tr>
<tr>
<td>-1</td>
<td>+3</td>
</tr>
</tbody>
</table>

B17. Our executives have recognised what must be done in order to achieve maturity in project management.

<table>
<thead>
<tr>
<th>Disagree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>-3</td>
<td>+1</td>
</tr>
<tr>
<td>-2</td>
<td>+2</td>
</tr>
<tr>
<td>-1</td>
<td>+3</td>
</tr>
</tbody>
</table>
B18. My company views and treats project management as a profession rather than a part-time assignment.

<table>
<thead>
<tr>
<th></th>
<th>Disagree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>[ ]</td>
<td>-3  -2  -1  0   +1  +2  +3</td>
<td></td>
</tr>
</tbody>
</table>

B19. Our lower- and middle-level line managers are willing to release their employees for project management training.

<table>
<thead>
<tr>
<th></th>
<th>Disagree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>[ ]</td>
<td>-3  -2  -1  0   +1  +2  +3</td>
<td></td>
</tr>
</tbody>
</table>

B20. Our executives have demonstrated a willingness to change our way of doing business in order to mature project management.

<table>
<thead>
<tr>
<th></th>
<th>Disagree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>[ ]</td>
<td>-3  -2  -1  0   +1  +2  +3</td>
<td></td>
</tr>
</tbody>
</table>
Section C

C1. Do you have explicit completion criteria for your projects, and, if so, who develops these?
Type response here>

C2. From the point of view of your completion criteria, how successful were these projects? What contributed to these outcomes?
Type response here>

C3. How successful were the projects from the owner’s perspective? What did they perceive as the factors affecting the project outcomes?
Type response here>

C4. Do you usually measure your progress (during the project) towards meeting the completion criteria? If so, what measures do you use? Do you have a formal data collection process? How reliable do you believe these measures to be?

[A ‘measure’ is any attempt at quantifying some aspect of the project, such as budget, number of tasks completed, leave days taken.]

Type response here>

C5. How do you identify and manage the risks associated with your projects? What are the major risks? Are these risks associated with the measures identified in C4?

[A risk is defined as any threat to the successful completion of the project.]

Type response here>

C6. Is there any subjective information you use in managing your projects, such as informal feedback from peers, conversations with users, gossip among team members?
Type response here>

C7. Taken overall in your management of projects, what is the relative importance that you place on a) task completion, b) budget monitoring, c) quality, d) people (in the team or others), e) methodology, f) user involvement, g) risk management?

Type response here>

C8. What do you believe is the most important skill required of a project manager?
Type response here>

C9. Any other comments about how you manage projects.
Type response here>
APPENDIX F

Measures Monitored
## Project Metrics

<table>
<thead>
<tr>
<th>Metric</th>
<th>Data Source</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Degree of adherence to the overall project schedule</td>
<td>Team meeting and adhoc reports</td>
<td>Weekly</td>
</tr>
<tr>
<td>Degree of adherence to the detailed training plan (a drill down of detail from the overall project plan)</td>
<td>Status update</td>
<td>Weekly</td>
</tr>
<tr>
<td>Degree of adherence to the budget</td>
<td>SL, Invoices, timesheets and internal hourly rates</td>
<td>Monthly</td>
</tr>
<tr>
<td>Issue resolution:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. % updated at least once a month</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Average time outstanding for all outstanding high priority issues</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>PI service centre KPIs and quality levels</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Risk Management - % of risks where mitigation has been actioned</td>
<td>Team meeting and adhoc reports</td>
<td>Monthly</td>
</tr>
<tr>
<td>% of External Service Provider deliverables that have been delivered as planned</td>
<td>Team meeting, project plan, status update</td>
<td>Weekly</td>
</tr>
<tr>
<td>Number of new change requests raised and the total to date</td>
<td>Change log</td>
<td>Forthnightly</td>
</tr>
</tbody>
</table>
APPENDIX G

Methodology User Manual

This appendix contains a copy of the process document that was prepared during the action research project as part of the learning process for the project members. The version as presented is the first version, and reflects the process that was adopted during the first iteration of the action research method.

Note that the pages numbers in the Table of Contents refers to the version used in practice, not to this copy. In addition, the pagination for this copy is different for this copy in order to conform to the standard layout.
xxx/UWS

Project Measurement Framework

Process Manual

Ver 1.2 (March 2002)
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Introduction

This document briefly describes the process for linking project goals to project measures, with the aim of increasing the probability of project success. The process, termed the Project Measurement Framework (PMF), is based on research conducted at the University of Western Sydney and refined in collaboration with xxx. As an evolving process, there remain some issues to be further developed, and potential users are encouraged to provide feedback.

The fundamental principle of the process is that by understanding the goals of a project, ranging from the explicit goals of the business users to implicit goals such as quality, a set of key measures (indicators or metrics) can be identified and used by the project manager to increase the likelihood of project success. Through a structured process of goal identification, measure definition, indicator and metric derivation, and selection and monitoring, the focus moves from reliance on measures derived from historical events (such as last month’s budget figures), to analysis and action based on “early warning” of potential problems.

Of course, the real situation lies somewhere between these two extremes. There is too much variability, and too many unknowns, to be able to claim that any approach is infallible. Rather, the aim of using the process is to increase the likelihood of success: the extent of this increase will depend to some degree on the extent to which the process is followed. There is a well-documented body of research underlying the process, so the challenge is to translate this research into a practical set of steps that can be used to add value that is well in excess of the cost.

Many experienced project managers will already be using many of the ideas encapsulated in the measurement process. The idea of monitoring not just explicit metrics (such as budget), but also the more intangible indicators (such as team morale) are not new ideas. However, what has been missing is some framework that can be used by less experienced project managers, across a variety of projects. Considerable attention is paid in managing projects to the concept of risk management. By their very nature, technology-related projects are never the same as another (unlike some undertakings, such as building a project home), so there is the always-present risk of the unknown. Risk management is about recognising risks, and putting in place processes to manage these risks. The Project Measurement Framework is thus essentially a risk-management tool, designed to assist in the identification of project risks, and provide a way of managing those risks. Risks can never be eliminated (at least not at an acceptable cost): we can only minimise them by judicious use of whatever means are at our disposal.

In the following chapters of this manual, the steps of the PMF are described in detail, with the aim of enabling a person who has some familiarity with managing projects to incorporate the process into their way of working. If it is not clear what needs to be done, the responsibility rests with the author (but please provide some feedback so the deficiency can be addressed).

As a final word, please keep in mind that the goal is to improve the chance of project success, not to identify indicators and metrics for their own sake.
Chapter 1: Overview

Definitions

The following provides a definition of terms used throughout this manual.

Measure – a characteristic of interest (especially of a project); for example, the success of a project.

Indicator – a measure with a finite set of values (often binary) that is used to assess the status of the measure; for example, an indicator relating to compliance to reporting schedules.

Metric – a measure with a potentially infinite set of values that is used to provide a numerical estimate of the measure; for example, a metric relating to the number of unresolved issues in a project.

Outline of the Process
A Brief Background

The origins of the PMF are in the Balanced Scorecard (BSC), developed by Robert Kaplan and David Norton of the Harvard Business School, first published in 1992. This was conceived as primarily a strategic management tool, and its main use today is as a planning and monitoring tool for management objectives. The BSC considers objectives, their interrelationships and measurement from four perspectives:

Financial
Customer
Internal Business Processes
Learning and Growth

There are two major characteristics of the BSC that commend it as a management tool:

There is a traceability of cause and effect from (for example) objectives (and therefore actions) from the process perspectives through the customer perspectives to the financial perspective (that is, processes affect customers, who affect financial performance).

There is a move away from lag measures (what happened in the past) to lead measures (what may happen in the future); this enables a more proactive management approach.

The BSC has been adopted by many organisations worldwide (including …), and has met with considerable success when applied consistently.

The BSC has as its main focus the financial perspective, and for commercial strategic planning this is quite appropriate. However, this perspective (with its implied focus of matters financial) is not universally appropriate for other uses of the BSC. This has led to a more generalised model, the Generalised Scorecard Model (GSM), which defines seven meta-perspectives, or definitions of perspectives that can be applied in particular uses of a BSC-like management framework. These meta-perspectives are:

Stakeholder
Recipient
Process
Infrastructure
Philosophy
Knowledge
People

Note that the BSC of Kaplan and Norton can be derived from this: financial from stakeholder, customer from recipient, internal business processes from a combination of process, infrastructure and philosophy, and learning and growth from a combination of knowledge and people.

For project management, the perspectives defined depend on the characteristics of the project, but are able to be derived from the seven meta-perspectives. Note that the perspectives are used to group and clarify the objectives, and are a convenient way of understanding the relevance of the objectives.

The text written by Kaplan and Norton on the BSC gives little detail on how to identify the measures that are defined and monitored as the way of ensuring that objectives are
met. Therefore, a technique pioneered in Europe for process measurement is used as a way of identifying measures. This is the Goal-Question-Metric (GQM) approach. The basic idea is that, given a goal (objective), one or more questions are posed that relate the goal to the metric (measurement) that provides a quantification of the goal.

The result is a set of measures that are defined as either indicators or metrics, and a selection of these made based on relevance and value, to give a small (~10) set of indicators and metrics that are used by the project manager. The final step is to identify the source of the data for each of the measures.

The process is iterative: it is common practice to revisit previous steps in order to incorporate greater understanding gained by the analyses. Even when the monitoring phase is under way, there may be a need to go back to any point in the process to ensure that the process is supporting the project.

By following the process as defined, the set of measures are sufficient, in that all project objectives have been addressed. Although there will be some relationship, they are also efficient, in that no smaller set will address all project objectives.
Chapter 2: Analyse Goals

Current management wisdom has it that the identification of goals is at the root of sound management practice. This premise is the starting point: unless the goals of the project are known, understood and accepted, then any project management technique will fail. The PMF is no different: unless the goals of the project are known, the outputs will be at best incomplete, at worst misleading.

**Step 1: Identify and clarify the goals of the stakeholders**

At first glance, this is deceptively simple – they are usually detailed in the project charter, and take the form of “to develop and implement a system that …”, or “to improve the efficiency of …”, or “to add new functionality to …”. These are all valid goals. The main problem is that there is sometimes no way of knowing whether these goals have been met or not when the project is “complete”. To increase our confidence in having met these goals (that is, having undertaken a successful project), the first task is to express the goals of the business owner in a way that permits a judgment as to whether or not the goals have been met.

**Task 1A: Recast the goals of the business stakeholders**

**Description**

This task may require rewriting the business objectives in such a way as to focus on activities or deliverables that the project manager has responsibility for and that can be demonstrated as having been met.

**Relationship to previous tasks**

Strictly speaking, as this is the first task in the PMF, this does not apply. However, it is highly desirable that the business goals (objectives) be traceable to higher-level corporate objectives. For reasons that will be explained in the next chapter, these corporate objectives should ideally be expressed in the terminology of the Balanced Scorecard. This will lay the foundation for traceability of project objectives to corporate objectives.

**Entry criteria**

A complete set of business objectives.

**Details of Task and Example**

Business objective: “Improvements in the ability to administer and handle clients calls resulting in an improved ability to meet key performance indicators.” From a project perspective, there is no way of demonstrating whether or not this objective has been met at the conclusion of the project. This criticism can be answered in a number of ways, two of which are:

Specify an amount by which the processes should be improved by at some specific time (say within three months of project completion).

Define one or more derived objectives that relate to what the project can do in order to satisfy the business objective.
The first is the classic quantification of goals (objectives) advocated by management texts, yet the figure is rarely based anything rational: “… resulting in a 10% cost reduction to meet …” – why 10%?, why not 20%?; why look at only cost (or time)? The quantification of goals for the purpose of judging project success is unlikely to yield any truly meaningful targets. [However, this is not the same thing as attempting to quantify goals for the purpose of better expressing and communicating them.]

The second approach holds more promise. This moves the responsibility for the outcomes into arena controlled by the project manager: the focus is on what the project manager can do (that is, has responsibility for). For the above example: “Analyse, design and implement process improvements to the way client calls are administered and handled.” Note that the jump has been made from a what to a how: the focus is on a concrete activity. In this case, there is no explicit quantification of the objective (some derived objectives may have one), but there is an implicit quantification in the sense of the quality of the steps taken to undertaken the task – these implicit objectives are addressed later.

Task completion criteria
A table such as the following:

<table>
<thead>
<tr>
<th>Corporate Objectives</th>
<th>Business Objectives</th>
<th>Explicit Project Objectives</th>
<th>Implicit Project Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Customer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Process</td>
<td>1 …</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 Improvements in the ability to administer and handle client calls resulting in an improved ability to meet key performance indicators.</td>
<td>Analyse, design and implement process improvements to the way client calls are administered and handled.</td>
<td>1 Apply industry best practice to the process improvement task 2 Adopt (or develop) a Quality Plan</td>
</tr>
<tr>
<td></td>
<td>3 …</td>
<td></td>
<td></td>
</tr>
<tr>
<td>People</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Task 1B: Validate the project objectives with the business stakeholders.

Description
The aim of this task is to obtain agreement from the business stakeholders for the project objectives, and to establish the completion criteria for each project objective.

Relationship to previous tasks
Continues the process of goal (objectives) identification and clarification.

Entry criteria
A table of project objectives (both explicit and implicit) such as that produced by Task 1A.

Details of Task and Example
The business objective described in Task 1A resulted in (at least) one explicit project objective. This objective now becomes the criteria by which the success (or otherwise) of the project in relation to the underlying business objective is measured.

*It is absolutely vital that the business stakeholders agree to this revised objective.*

In this example, the implicit assumption is that an improvement in the processes used to administer and handle client calls is all that is needed to meet the business objective. This assumption should be tested, such as:

The processes may not be the issue, staff skill levels may be.

Revised HR practices may be needed as well.

The point is that everyone needs to be clear on what the business objective *means*, and what has to be *done* by the project. This step will often mean considerable dialog between the business stakeholders and the project manager.

[NB: This need for clarification would exist even if the PMF were not used: many projects flounder due to poor and/or misunderstood business objectives.]

The implicit project objectives may not need to be discussed with the business stakeholders. However, they are used to establish the completion criteria: “… if the project implements process improvements, and these revised processes are based on industry best practice and the tasks are performed according to accepted quality standards, then your business objective will have been met …”.

Task completion criteria

Sign-off by the business stakeholders to the set of completion criteria derived from the project objectives.

---

**Task 1C: Recast the goals of the other stakeholders**

**Description**

The preceding discussion has assumed that the major stakeholder in any project is the business owner, and in many cases, will be the only stakeholder. However, there are some projects where there are other stakeholders that need to be explicitly considered as far as project objectives are concerned. One example would be where there are legal constraints (such as privacy regulations) that override general business objectives.

**Relationship to previous tasks**

This task cannot be done in isolation from clarifying the business objectives – they are related, and there is scope for a degree of overlap. It is important to keep in mind that the purpose of the exercise is to have a clear set of objectives, not to artificially allocate objectives to a particular group of people.

**Entry criteria**

It is recommended that the objectives of the business owner be clarified before this task commences.

**Details of Task and Example**
A typical objective would read something like “… to ensure compliance to the Privacy Act in respect of all customer data …”. The aim is to turn this into objectives that can be controlled by the project manager, in a similar manner to the business objectives.

Task completion criteria
A table such as:

<table>
<thead>
<tr>
<th>Corporate Objectives</th>
<th>Stakeholder Objectives</th>
<th>Explicit Project Objectives</th>
<th>Implicit Project Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Customer</td>
<td>1 …</td>
<td>1 Analyse and document the implicit requirements embodied in the Privacy Act</td>
<td>Ensure that all requirements are included in the system design through extensive stakeholder involvement.</td>
</tr>
<tr>
<td></td>
<td>2 Ensure compliance with the provisions of the Privacy Act in respect of customer data.</td>
<td>2 To incorporate the requirements of the Privacy Act in systems design.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 …</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Process</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>People</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Step 2: Clarify the goals of the recipients**

Attention now turns to the second of the meta-perspectives: the recipients. Under this heading, we ask the question “Who will be using the product or service that this project produces?” In the more general case, the answer will be the end consumer, either the purchaser of a product or the user of a service. Note that the focus has widened from the generic ‘customer’ of the BSC, to be a more inclusive term, enabling such entities as charities to use the GSM as a basis for planning and managing.

Thus, the key is to identify the recipients: exactly who are the ultimate end-users?

**Task 2A: Identification**

**Description**

This task involves considering who will use, benefit, interact with, operate, access, or otherwise be involved in some way with the output of the project. Sometimes this will be clear from the project objectives, however there are often less obvious recipients that should be considered. For example, in a banking application, it is tempting to only consider the staff at the teller stations as the recipients, but what about the customers in front of them, internal auditors, the taxation authorities, OHS inspectors, supervisors, and so on?

**Remember**: the whole purpose of the exercise is to reduce the risk associated with the project, and one of the more significant risks is missing requirements until late in the project: anything that assists in identifying project tasks is helping to reduce risk.
Relationship to previous tasks
There are no prerequisites for this task.

Entry criteria
A sound understanding of the project.

Details of Task and Example
Consider a project to design a new automated teller machine (ATM): some recipients would be:

Users (i.e. customers of the owning bank and other institutions), including visibility, reach and keyboards for the blind

Security guards who restock the machine

Security staff who monitor the immediate surrounds (can you photograph the keyboard)

Auditors

Bank staff who have to replace supplies such as receipt slips

Cleaners

Architects who design the surroundings or integrate it into existing buildings

Manufacturers

The major trap here is to list everyone, just in case! This is clearly not helpful, and it is a matter of judgment as to who should be included in the list. In the end, the test has to be related to the project goals: in this example, a perfectly adequate ATM can be designed with little reference to the above, relying instead on the skills of the project team to consider such issues. Maybe this is the difference between adequate design and excellent design: what are the goals of the project?

Task completion criteria
Two lists:
A list of primary recipients, who have a clearly identified stake in the project, with documented reasons why they are considered primary recipients.

A list of secondary recipients (the rest): this list can be an input to the requirements definition phase (or similar) of the project.

Task 2B: Analyse their goals

Description
Once we know who the recipients are, we have to list their goals, and then translate these into project objectives, in a form similar to that above.

Relationship to previous tasks
Follows the task of identifying the recipients.

Entry criteria
A list of primary recipients.

Details of Task and Example
As an example, consider the internal auditor as a recipient for a retail banking system. At the simple level, there are two goals for this recipient:
To incorporate adequate controls into the system
To be able to verify that the controls are working

From a project perspective, this is about thorough requirements analysis and design, so the project objectives will relate to analysis and design practices, and to user involvement.

Task completion criteria
A table such as:

<table>
<thead>
<tr>
<th>Corporate Objectives</th>
<th>Recipient Objectives</th>
<th>Explicit Project Objectives</th>
<th>Implicit Project Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Customer</td>
<td>1 …</td>
<td>1 Analyse and document the implicit requirements for the auditors.</td>
<td>Ensure that all requirements are included in the system design through extensive stakeholder involvement.</td>
</tr>
<tr>
<td></td>
<td>2 Ensure that audit controls are built into the system and that these controls can be verified in operation.</td>
<td>2 To incorporate these requirements into systems design.</td>
<td></td>
</tr>
<tr>
<td>Process</td>
<td>3 …</td>
<td></td>
<td></td>
</tr>
<tr>
<td>People</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Step 3: Clarify the goals relating to process**

The next meta-perspective to be considered is that of process. Here the focus is on the processes that the project team undertakes, NOT the processes that may be developed as part of the output of the project team. Therefore, in defining this set of goals, the issues to be considered revolve around what the project produces and how the project team carries out its tasks.

**Task 3: Analyse goals**

**Description**

The key to this set of objectives is to focus the actual activities that each member of the project team (including the project manager) undertake in order to fulfil the requirements of the project. Objectives must express goals that are under the control of the project team.

**Relationship to previous tasks**

A convenient way to start deciding these objectives is to consider what (product or service) is delivered to each of the recipients, and then consider how these are produced. Therefore, this task should follow the task of determining the goals for the recipients.

**Entry criteria**
A set of objectives for the recipients.

Details of Task and Example

A typical objective for process that addresses the what might be: “To develop a training package for the system users that permit certified progression through staged levels of competency.” Note that in this example, some attempt has been made to add additional detail to the standard “… produce a training package …”, as this makes the next step easier.

At this point, it is necessary to distinguish between the objectives at the stakeholder level, and the what objectives at the process level. For the former, the focus is on corporate objectives, that is, such issues as improvement in efficiency, a greater return on investment, or an increased level of service to the public. At the process level, the focus is on specific products (and how they are produced), that will satisfy these higher level objectives.

There is a clear relationship between these higher level objectives and the products that satisfy them, but that is exactly the point of this process: establish a set of cause-and-effect relationships at the various meta-perspective levels.

Continuing the above example, it is now necessary to consider how the project team would satisfy this objective. Possibilities include: “… adapt the training package from Project X for this project “…”, “… issue a contract to an external provider “…”, “… buy an existing package “…”, or “… develop a new package “…”. It would be usual (desirable?) to include a quality objective also: “… that meets Australian Standard xxx …”.

As another example, consider a project that includes the development of a computer-based information system. The what objective may be: “To develop a Customer Information Systems that supports the call centre operators and provides customers with an online interface to their own data.” The corresponding how objective may be: “… through the development of a web-enabled database system that is both scalable and portable across multiple platforms, conforming to the interface requirements of the corporate information architecture ….”.

Note that these objectives start to cross over into preliminary design (especially selection of alternatives), so it may not be clear at the beginning of the project exactly which how will be selected. This is quite normal! It may be necessary to have a simpler (preliminary) objective like: “… undertake a preliminary study to assess and select an appropriate architecture for the system ….”.

The process of objective identification and refinement is an iterative process.

Task completion criteria

A table such as

<table>
<thead>
<tr>
<th>Corporate Objectives</th>
<th>Product or Service Objectives</th>
<th>Project Process Objectives</th>
<th>Implicit Project Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Customer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Process</td>
<td>1 …</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
2 To develop a Customer Information Systems that supports the call centre operators and provides customers with an online interface to their own data. To develop a web-enabled database system that is both scalable and portable across multiple platforms, conforming to the interface requirements of the corporate information architecture

1 Apply industry best practice to the development process
2 Adopt (or develop) a Quality Plan

Step 4: Clarify the goals relating to infrastructure

This meta-perspective looks at the *wherewithal* the project team needs to complete its task, and in doing so, specifically considers the quality of the infrastructure, and its efficient and effective use. For some projects, this meta-perspective may not yield any objectives, especially those that are “standard”, that is, require little in the way of additional or new infrastructure, or do not involve the use of “leading edge” technology. The focus is therefore on identifying those items of infrastructure that may pose a risk because of the need to acquire them, learn how to use them, or apply them in new ways: this is where “bleeding-edge technology” is accounted for.

Task 4: Analyse goals

Description

Does the project need any new (or additional) infrastructure? Is the use of this something that the project team has to learn? Will this be used in way that has never been done (successfully) before? If the answer to any of these questions is “yes”, then it is necessary to formulate objectives to recognise their importance to the project team.

As before, the important thing to keep in mind is that the objectives must be phrased in such a way that the project team is responsible for the meeting of the objectives.

Relationship to previous tasks

This task can be performed independently of preceding tasks.

Entry criteria

Completion of preliminary design to the extent that infrastructure needs are known.

Details of Task and Example

Consider a computer-based information system that keeps track of where vehicles are by the use of Global Positioning System information. This system is likely to involve several unknown technologies for many project teams, and test equipment will need to be acquired and used as part of the development process. An appropriate objective may be: “… to research and acquire GPS equipment compatible with the corporate information architecture …”, and also “… to establish a communications protocol for the GPS equipment based on Australian Standard yyy …”.

Appendices 46
In these objectives, consideration needs to be given to acquisition, learning and use of the equipment, that is, those things that carry the greatest risks.

Task completion criteria
A set of objectives relating to infrastructure that are expressed in a way that the project team can action them.

Step 5: Clarify the goals relating to the philosophy of the project

Of all of the meta-perspectives, this is conceptually the most difficult to describe. Think of this as reflecting the project's cultural environment: the organisational culture, reflecting the values and practices of the management and staff, and the professional culture, reflecting the "way things are done around here". Of these two variations on the environment, the second is the more important. What we want to do is to formulate goals that reflect the objectives that the project has to achieve, yet are often not articulated.

Some examples may assist. Some organizations actively encourage individuality in their project teams, while others focus on team results. Therefore, the former organization may set an objective of "… to consciously organise tasks around individual skills …", while the latter may have "… to organise the project staff into teams so that skills are as transferred as much as possible …". Another example: there may be an emphasis on a particular development method and supporting management reporting, or this may not be an issue, and teams are freer to choose their method and reporting scheme.

Note that no value judgement is implied here: the aim is to explicitly recognise what is expected of the project team.

Task 5: Analyse goals

Description
Are there any management styles, implicit or otherwise, that may have a significant impact on the way the project is run. Are there any technical guidelines that have to be followed? Is there a particular project reporting method that has to be followed? For the majority of projects, the answer is usually 'yes', however, it needs to be established if these are significant for the project, that is, pose a risk to its successful execution.

Sometimes the project will have goals that are incompatible with established guidelines, rules and procedures, and it is desirable that these be brought out into the open and resolved as soon as possible.

Consider a project that involves developing a new GUI for front-line staff, to run under Windows XP. It may be that the organization has a standard relating to development methods that would make this project difficult to execute, as it may be more targeted towards traditional business systems that use technology dating from the 1980s. This project may need to move to a truly object-oriented method, and this need, given the technical guidelines of the organization, needs to be expressed as an explicit objective for the project.

Relationship to previous tasks
Does not need to follow any other task.
Entry criteria
None.

Details of Task and Example
Continuing with the above example, the objective may read something like: "… to investigate, adapt and adopt an object-oriented development approach that provides a reliable method for interfacing with Windows XP objects …". This objective then provides the project team with a set of tasks that can be measured and monitored, and discussed in management meetings and so on with the explicit understanding of the implications of the tasks and their relevance to the project.

Task completion criteria
A list of objectives relating to the environmental culture.

**Step 6: Clarify the goals relating to knowledge**

Knowledge is about ensuring that the project team has access to current knowledge relevant to the tasks they are undertaking. There are two main aspects to this: knowledge that resides in people, especially users, and knowledge that is available generally, such as in knowledge bases.

Many IS-related projects fail due to insufficient communication between the developers and those for whom the project is being undertaken. Two major reasons for this can be identified: politics and arrogance. The former revolves around the notion of control: those who "own" the project sometimes feel that they fully understand the needs (especially business needs) of the project, and no not let their staff be involved. Arrogance has its roots in a few people believing that they are the source of all information about the project, and do not recognise the need to tap into other sources of information. Objectives can be formulated that recognises these somewhat unpleasant truths (of course, overcoming them is quite another matter).

The second aspect of the knowledge objectives relates to ensuring that the project team has timely access to such mundane things as existing system documentation. At a potentially more important level, it is about ensuring that current knowledge in the world at large can be brought to bear on the project: very few projects are totally new (true for a research lab), so there is some information somewhere that can be of use. Libraries and the Internet are obvious sources, yet rarely are these resources made available, much less encouragement forthcoming for their use. (An oft-quoted reason is that there is no time for this background research: translation - we have the time and money to reinvent the wheel or to do a second-class job, but no time to learn from others.)

If the preceding meta-perspective (philosophy) is the most conceptually difficult to get a handle on, this is the most emotionally-charged: very few business owners and project managers will own up to the issue of knowledge being a problem for their project.

**Task 6: Analyse goals**

Description
The focus is on the two aspects of knowledge described above: identifying those who can provide information on the needs and goals of the project, and providing access to
relevant knowledge that is relevant to the project (in terms of both product and method). For the former, ask "who really knows how things work", and "who are the real users", and for the latter, assume the default stance of needing to know everything about the project.

Relationship to previous tasks
None.

Entry criteria
None.

Details of Task and Example
Consider the example of a project undertaken with the aim of developing a loan calculator (these were popular in the late 1980s, and every lending institution boasted about their own; this example is based on actual events). In this case, the retail banking group may be the business owner, and will likely specify the "requirements", that is, describe in general terms what the software has to do. The project team will have no problem understanding these requirements (as they have probably have some personal experience with them), and so development proceeds. The end product is delivered on time and to budget, and is a showcase example of the programmer's art: all acclaim the project to be a success.

The system is deployed to the lending staff and receives few accolades, potential customers do not see it as providing any information not available from rival lenders. From the project manager's view, the project was a success, so too from the view of the business owner, yet no real competitive advantage accrued from the system. Assuming that the system was developed to enable some marketing to be launched (which many were), then the system did not fulfil its goals.

At this level, objectives can be formulated relating to knowledge: the source of requirements, in that the lending staff and customers should be included as sources of knowledge, such as "... to identify and use information from both direct und-users (primarily lending staff) and indirect users (customers), as well as marketing staff ...". In addition, objectives can be formulated relating to research on other products (which in fact were done), but also on what else could be included as part of the delivered functionality, such as "... to research similar products and additional features ...".

Note: there would also be objectives at the stakeholder level for this system. Also note that the project should be considered from as broad a view as possible: what value is it adding to the organization? While political considerations may make this difficult, simply taking the view that the project team will deliver what the owner says is sometimes taking the easy way out. The hard questions need to be asked.

Task completion criteria
A list of objectives relating to knowledge in its two forms.

**Step 7: Clarify the goals relating to people**

Just about every organization says it, yet a much smaller proportion live it: "people are our greatest asset". This meta-perspective recognises people as the pedestal upon which projects are built. Other meta-perspectives have also recognised people as important facets of a project, but this one alone has people as its sole focus. It is interesting to ask why people are acknowledged as key to organizations, yet ask why the reality falls way short of this. The answer (especially for technology-related projects) may be related to
the fact that most project managers (and many of their supervisors) have a technical, rather than a psychology, background: they are much more comfortable and knowledgeable about matters technical, much less so about matters dealing with people and their individuality.

People are the means to get projects completed, yet there are few theories and practices that allow this key resource to be managed consistently and effectively, in the sense that people are "one" resource. Certainly some tasks can be characterised in terms of the people resources required: building a house, planting a crop or building a bridge. Yet many others defy this: how long does it take to code a module of C++ code? Putting aside the issue of not knowing exactly what is module is, much less how large each is or how many are required, each programmer will undertake the task at differing rates, and this does not necessarily depend on technical expertise, and can vary from day to day.

The objectives for this meta-perspective are somewhat "softer" than at most of the other levels. They talk about issues such as motivation, team interaction, personal differences and whole of life pressures.

Be warned: many organizations find this meta-perspective to be too difficult to explicitly form objectives for, and revert to being an organization that pays lip-service to its staff.

Task 7: Analyse goals

Description

A practical way to approach the formulation of goals for this meta-perspective is to return to the aim of this process: to minimise risk. This allows us to pose questions such as what impact particular individuals will have on a project, and then formulate objectives to cater for any potential risk. Similarly, we can pose questions relating to team functioning in a multi-cultural environment, and frame objectives (and thus actions) to make this a positive for the project.

Relationship to previous tasks

None, except that all of the objectives relating to people are inter-related, as discussed in the next chapter.

Entry criteria

Some understanding of people.

Details of Task and Example

People have already been considered in several of the other meta-perspectives, as stakeholder, recipients and as a source of knowledge. These aspects need not be repeated here. What needs to be considered particularly are the issues concerned with people that comprise the project team, including the traditional team staff, the steering committee or similar, and any other people who are involved in the management of the project (conceptually right up to the board of directors for some projects).

A framework for this is as follows (although this is by no means an exhaustive list):

Team staff

Project manager

Experience

Prejudices
Life goals
Team members
  Experience
  Prejudices
Life goals
Relationships
  Within the team
  External to the team
Pressures
  Work related
  Personal
External staff
  Direct managers (steering committee)
    Experience
    Prejudices
    Political pressures
Corporate governance
    Experience
Typical objectives may thus be: "… to ensure that task assignments and schedules are set with due recognition of individual circumstances, and that a mechanism for negotiation is in place and operating …", or "… to prepare briefing material for senior managers as to the technical issues that may have an impact on other areas of operation of the organization …".

Focus on possible areas of risk, but try to resist the temptation to assume that there are no risks, … and watch the movie *Patch Adams*.

Task completion criteria
A set of project objectives that recognises people as the key resource for the project.
Chapter 3: Codify Perspectives

The previous chapter explained in some detail how objectives are formulated for each of the seven meta-perspectives. The examples given were chosen to highlight aspects peculiar to each of the meta-perspectives, but it should be remembered that not all meta-perspectives are equally relevant for a particular project being considered. Some projects are concerned primarily with organisational change, while at the other end of the spectrum, others may be more related to the technical infrastructure. While the set of objectives identified for a particular project can be built to some extent on those for a similar project, each must be treated on its own merits.

This chapter is concerned with defining the perspectives relevant to a particular project (or possibly, to a set of projects) in order to provide focus from a project management perspective. This is similar to the Balanced Scorecard and its four perspectives: financial, customer, internal business processes and learning and growth. The perspectives are defined to highlight (for management purposes) the important aspects being managed. Likewise for projects: we need to have a set of perspectives that managers can use to focus on particular aspects of the project. Some organisations may wish to have a similar set of perspectives for a number of projects to enable comparisons to be made between them – this is acceptable, however the relevance of the particular set needs to be reaffirmed on a regular basis.

There is no “magic number” of perspectives, with seven being the maximum (the number of meta-perspectives). Four would be the most common, but three or five would not be unusual. However, two or six would be quite uncommon, and one or seven not very useful. Hence, the initial cut should be aimed at three to five perspectives. As with other parts of this process, the tool should be used to fit the need, so be prepared to vary the initial number of perspectives if circumstances warrant.

To illustrate how perspectives are identified, a set of objectives for each of the seven meta-perspectives will be defined for a particular project, and this set used throughout the chapter. The project is a real-life example, the French Railway Ticketing System.

The French Railway Ticketing System

The French Railway System, SNCF, is famous for its high-speed trains (TGV) and the quality of its engineering. In 1989, a contract was signed to modify the SABRE system of airlines reservations fame. The contract called for the creation of the SOCRATES computerised reservation system by 1993, at a projected cost of US$210M. One of the largest implications of the decision to base the new system on SABRE was a fundamental change to the way fares were calculated. Airlines go to great lengths to maximise their revenue by automatically changing the fares based on demand, how far in advance you book, where you sit, distance, and so on.

This was a new idea for train travellers, who were used to far much less variability in the pricing. One of the aims of the system was to identify peaks in demand and force prices up, thus encouraging passengers to utilise other, under-utilised, services. These changes required that much of the initial development be carried out in secret, due to the political and commercial issues involved. Despite some early problems, the system was phased in from the start of 1993.
The above description leaves many questions unanswered, however, it is possible to develop an initial set of objectives.

**Objectives for the French Railway Ticketing System based on the meta-perspectives**

**Stakeholder**

1. To provide the travelling public with a convenient ticketing system, as reflected by passenger surveys and passenger numbers.
2. To provide a means of maximising the revenue from the TGV network through load monitoring and pricing flexibility.

**Recipient**

3. To provide passengers with a ticketing system that enables convenient bookings, including the selection of times, class, and seating, in a time that at least matches world best practice.
4. To enable ticketing agents to use the system for the benefit of their customers, in that it is as convenient to use a ticketing agent as an SNCF booking office.
5. To provide train schedulers with the information required to maximise usage (in terms of passenger loads).
6. To provide operating staff (especially conductors and station staff) with such information that enables them to provide passengers and potential passengers with up-to-date and accurate information about routes, schedules and fares.

**Process**

7. To modify the SABRE airline reservation for use by SNCF.

**Infrastructure**

8. To understand the pricing algorithms underlying SABRE in order to adapt them for use in SOCRATES.

**Philosophy**

9. To develop a system that acknowledges both the technical focus of SNCF and the needs of the travelling public.

**Knowledge**

10. To conduct research into past and current uses of SABRE and computer-based ticketing systems.
11. To consult with all user groups in order to document and use their experience and knowledge.
12. To undertake a review of all base data (including route and scheduling data) to ensure accuracy.
13. To ensure that all team members understand the principles of ticketing systems.

**People**

14. To recruit a development team that is experienced in ticketing and reservation systems.
15. To ensure continuity of team membership by implementing career progression strategies.

**Step 8: Group objectives**

The seven meta-perspectives are the starting point for the determination of objectives for the project. However, the names assigned to these meta-perspectives are not necessarily meaningful when it comes to managing the project. The phase of refinement described in this chapter is concerned with re-arranging (grouping) the objectives into perspectives that are meaningful to the project.
Task 8: Assign Keywords

Description

The first part of this task is to prepare a list of keywords that can be used to typify the objectives. The best analogy is to consider these keywords as the retrieval keys that we would use if the objectives were stored in some sort of repository. We are familiar with this sort of idea when we use keyword searches of the Internet when we are not sure of the site we need.

Relationship to previous tasks

Requires a set of objectives.

Entry criteria

Completion of all previous tasks.

Details of Task and Example

There are (at least) two ways to approach this. The first involves identifying common ideas or themes for the project, by considering the project overall. The second is through a step-by-step analysis of each objective to isolate keywords. If those developing the objectives are very familiar with the system (and there has been good communication with the stakeholders), then the first is the quicker route. On the other hand, the second is more reliable, and it is this method that will be described here.

As an example, take objectives 6: “To provide operating staff (especially conductors and station staff) with such information that enables them to provide passengers and potential passengers with up-to-date and accurate information about routes, schedules and fares.”

If this were to be stored, and we wanted to then retrieve it with a keyword search, the keywords that would appear most useful are ‘staff’, ‘information’ and ‘passenger’.

As another example, take objective 11: “To consult with all user groups in order to document and use their experience and knowledge.” Appropriate keywords would be: ‘user’, ‘experience’, and ‘knowledge’.

Task completion criteria

A table such as

<table>
<thead>
<tr>
<th>No</th>
<th>Objective</th>
<th>Keywords</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>To provide the travelling public with a convenient ticketing system, as reflected by passenger surveys and passenger numbers</td>
<td>Passenger, quality</td>
</tr>
<tr>
<td>2</td>
<td>To provide a means of maximising the revenue from the TGV network through load monitoring and pricing flexibility</td>
<td>Revenue</td>
</tr>
<tr>
<td>3</td>
<td>To provide passengers with a ticketing system that enables convenient bookings, including the selection of times, class, and seating, in a time that at least matches world best practice</td>
<td>Passenger, quality</td>
</tr>
<tr>
<td>4</td>
<td>To enable ticketing agents to use the system for the benefit of their customers, in that it is as convenient to use a ticketing agent as an SNCF booking office</td>
<td>System user</td>
</tr>
</tbody>
</table>
To provide train schedulers with the information required to maximise usage (in terms of passenger loads)

To provide operating staff (especially conductors and station staff) with such information that enables them to provide passengers and potential passengers with up-to-date and accurate information about routes, schedules and fares

To modify the SABRE airline reservation for use by SNCF

To understand the pricing algorithms underlying SABRE in order to adapt them for use in SOCRATES

To develop a system that acknowledges both the technical focus of SNCF and the needs of the travelling public

To conduct research into past and current uses of SABRE and computer-based ticketing systems

To consult with all user groups in order to document and use their experience and knowledge

To undertake a review of all base data (including route and scheduling data) to ensure accuracy

To ensure that all team members understand the principles of ticketing systems

To recruit a development team that is experienced in ticketing and reservation systems

To ensure continuity of team membership by implementing career progression strategies

<table>
<thead>
<tr>
<th>Step 9: Name and validate perspectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>The focus now changes to the keywords. By using synonyms and undertaking a frequency count, potential groups start to emerge. These are given names to reflect the keywords. Any duplicate objectives are removed.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Task 9: Reorganise, Consolidate and Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
</tr>
<tr>
<td>The goal is to produce approximately four groups based on the keywords.</td>
</tr>
<tr>
<td>Relationship to previous tasks</td>
</tr>
<tr>
<td>Follows the identification of keywords.</td>
</tr>
<tr>
<td>Entry criteria</td>
</tr>
</tbody>
</table>
Completion of the identification of keyword task.

Details of Task and Example

The keywords (total = 30) from the above table are:

- Passenger, quality
- Revenue
- Passenger, quality
- System user
- Staff, usage
- Staff, passenger, information
- SABRE
- SABRE, pricing
- Technical management, passenger
- SABRE, research
- User, knowledge, experience
- Quality, information
- Team, ticketing
- Team, ticketing, reservations
- Team, career

Rearranging these by frequency, and assuming some synonyms, we get:

- 7 Technology (includes SABRE, usage, ticketing and reservations)
- 5 Information (includes knowledge, experience and research)
- 4 Passenger
- 4 Team (includes career)
- 3 Quality
- 3 Staff (includes technical management)
- 2 User (includes system user)
- 2 Pricing (includes revenue)

Now comes the grouping, and this may require re-reading the objectives:

- 2 Pricing (includes revenue)

- 4 Passenger
- 3 Staff (includes technical management)
- 2 User (includes system user)

- 7 Technology (includes SABRE, usage, ticketing and reservations)
- 3 Quality

- 5 Information (includes knowledge, experience and research)

- 4 Team (includes career)
The groupings have been chosen to reflect the (assumed) underlying meanings of the objectives. For example, the ‘quality’ objectives have been grouped with the ‘technology’ objectives as it is mainly a technical issue about ensuring quality (such as the rigour in designing screens). The order has also been chosen to reflect the overall order of the meta-perspectives.

We now assign names to each of the groups. For the above example, suggested names are as follows:

Financial
Pricing (includes revenue)

User
Passenger
Staff (includes technical management)
User (includes system user)

Technology
Technology (includes SABRE, usage, ticketing and reservations)
Quality

Research
Information (includes knowledge, experience and research)

Project Team
Team (includes career)

The next step is to reassemble the objectives under the perspectives, duplicating where necessary if keywords belong to more than one perspective. For example, under the ‘Research’ perspective, the following objectives occur:

To provide operating staff (especially conductors and station staff) with such information that enables them to provide passengers and potential passengers with up-to-date and accurate information about routes, schedules and fares

To conduct research into past and current uses of SABRE and computer-based ticketing systems

To consult with all user groups in order to document and use their experience and knowledge

To undertake a review of all base data (including route and scheduling data) to ensure accuracy

Each perspective is examined to ensure that all of the objectives do in fact refer to that perspective. In the above example, the first of these does in fact not belong in this perspective: it refers to information that is to be provided by the system, rather than information used by the team to complete the project. The other keywords will ensure that it is included in another perspective (sometimes it will be necessary to explicitly move the objective into another perspective).

Task completion criteria
A set of perspectives and their associated objectives, such as:

<table>
<thead>
<tr>
<th>Perspective</th>
<th>Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial</td>
<td>To provide a means of maximising the revenue from the TGV network through load monitoring and pricing flexibility</td>
</tr>
<tr>
<td></td>
<td>To understand the pricing algorithms underlying SABRE in order to adapt them for use in SOCRATES</td>
</tr>
<tr>
<td>User</td>
<td>To provide the travelling public with a convenient ticketing system, as reflected by passenger surveys and passenger numbers</td>
</tr>
<tr>
<td></td>
<td>To provide passengers with a ticketing system that enables convenient bookings, including the selection of times, class, and seating, in a time that at least matches world best practice</td>
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<tr>
<td></td>
<td>To enable ticketing agents to use the system for the benefit of their customers, in that it is as convenient to use a ticketing agent as an SNCF booking office</td>
</tr>
<tr>
<td></td>
<td>To provide train schedulers with the information required to maximise usage (in terms of passenger loads)</td>
</tr>
<tr>
<td></td>
<td>To provide operating staff (especially conductors and station staff) with such information that enables them to provide passengers and potential passengers with up-to-date and accurate information about routes, schedules and fares</td>
</tr>
<tr>
<td></td>
<td>To develop a system that acknowledges both the technical focus of SNCF and the needs of the travelling public</td>
</tr>
<tr>
<td>Technology</td>
<td>To provide train schedulers with the information required to maximise usage (in terms of passenger loads)</td>
</tr>
<tr>
<td></td>
<td>To modify the SABRE airline reservation for use by SNCF</td>
</tr>
<tr>
<td></td>
<td>To understand the pricing algorithms underlying SABRE in order to adapt them for use in SOCRATES</td>
</tr>
<tr>
<td></td>
<td>To develop a system that acknowledges both the technical focus of SNCF and the needs of the travelling public</td>
</tr>
<tr>
<td></td>
<td>To conduct research into past and current uses of SABRE and computer-based ticketing systems</td>
</tr>
<tr>
<td></td>
<td>To provide the travelling public with a convenient ticketing system, as reflected by passenger surveys and passenger numbers</td>
</tr>
<tr>
<td></td>
<td>To provide passengers with a ticketing system that enables convenient bookings, including the selection of times, class, and seating, in a time that at least matches world best practice</td>
</tr>
<tr>
<td>Research</td>
<td>To conduct research into past and current uses of SABRE and computer-based ticketing systems</td>
</tr>
<tr>
<td></td>
<td>To consult with all user groups in order to document and use their experience and knowledge</td>
</tr>
<tr>
<td></td>
<td>To undertake a review of all base data (including route and scheduling data) to ensure accuracy</td>
</tr>
<tr>
<td>Project Team</td>
<td>To ensure that all team members understand the principles of ticketing systems</td>
</tr>
<tr>
<td></td>
<td>To recruit a development team that is experienced in ticketing and reservation systems</td>
</tr>
</tbody>
</table>
To ensure continuity of team membership by implementing career progression strategies

Note: The process described above is tedious and inexact. This probably explains why most people will want to use the first of the methods described to determine perspectives. Do not get hung up on this task – it is not a critical component of the process. The important thing is to identify objectives for each of the meta-perspectives, and to organise these into about four groups to reflect the important ideas or foci of the project from a management point of view. However, do not stay with the seven meta-perspectives: at least work out about four groups based on your best guess.
Chapter 4: Frame Questions and Define Measures

The first major part of the process is now complete: the objectives have been identified and organised into perspectives. The next major step is to use the Goal-Question-Metric framework to derive metrics that enable us to judge whether the objectives have been met. This chapter is concerned with framing the appropriate questions.

The general idea is that, in order to determine whether the objective has been met, we (subconsciously) ask questions. For example, in seeking to know if a project was successfully completed, we are implicitly asking if time, cost, scope and quality targets have been met; to be able to answer these implicit questions, we have to have the appropriate information at hand: hence the use of measures (or metrics).

Once the questions have been posed, the next step is to propose one or measures that provide the evidence required to answer the question. These measures are of one of two types: indicators, that typically have only two values, and metrics, that can have an unlimited number of values (usually continuous).

**Step 10 (Repeated): Write question(s)**

This step is repeated for every objective.

The key to this task is to understand what questions you would ask to ascertain if the objective has been met (note that you may need several questions for each objective). This has to be a complete set: you are not allowed to ask any more questions.

**Task 10: Formulate one or more questions**

**Description**

Implicit in every objective (if it is a well-expressed objective) are a series of questions, that, if answered, will indicate whether or not the objective has been met. It is important to realise that the answers may be indirect, that is, provide circumstantial evidence. For example, for the objective “… to minimise staff turnover by actively monitoring and promoting staff morale …”, one questions may be “… what is the current state of team morale?”; the answer may be “… last month’s staff survey indicates that there are no major problems …”. This is an indirect answer, because it does not directly provide a measure of staff morale (which may not even be measurable), but rather another measure from which staff morale can be implied.

**Relationship to previous tasks**

This task should follow objectives definition.

**Entry criteria**

An objective.

**Details of Task and Example**

Consider the objective: “To undertake a review of all base data (including route and scheduling data) to ensure accuracy”. To judge whether this objective had been met, the
following questions could be asked: “Have all possible sources of data been identified? Have review standards been developed? Has a review of these sources been undertaken? If not, is there a plan, and is this plan being adhered to? Have the outcomes of the reviews been folded into the project plan?” Posing questions for an objective requires an understanding of the objective and how that objective will be satisfied, that is, the tasks involved.

The important feature of each question is that it can be answered by objective data – it should not give a subjective judgement. This is not always easy to adhere to. In the above example, the question “Have all possible sources of data been identified?” depends to a certain extent on a subjective judgement about “all possible sources”. The answer is unequivocal (‘Yes’ or ‘No’), but there is an implicit reliance being placed on the credibility of the person providing the answer – making this judgement is beyond the scope of the current discussion (although we could ask “Is the person identifying the data sources sufficiently knowledgeable of the data sources?”, but this can lead to an inordinate number of questions, possibly without end).

Task completion criteria
A set of one or more questions for each objective.

**Step 11 (Repeated): Identify measures**

This step is repeated for every question.

Once the questions have been framed, we next look for evidence that would enable us to answer the question, in the form of a measure in its widest sense. The goal is to specify precise measures, but this may not always be possible: the refinement process can wait a little longer.

**Task 11: Define measures**

**Description**

The key to this step is to ask the question “What information would enable me to answer the question?” The information will likely be of varied forms.

**Relationship to previous tasks**

Further refines the questions into measures that can be related to characteristics of the project.

**Entry criteria**

A set of questions.

**Details of Task and Example**

Consider the question: “Have all possible sources of data been analysed for relevance?” The task is to seek information that will enable the question to be asked. Note that there is the trivial information reflected by the answers ‘Yes’ and ‘No’, but this is not what we are after.

If we analyse the question, it is apparent that there are two items of information: the number of possible sources of information, and, for each of these, a judgement as to whether they have been analysed. From a project perspective, continuous measures, or
measures that vary over time, are often more useful than simple binary (‘Yes’ and ‘No’) measures.

In this case, we can propose a measure of percentage of possible data sources that have been analysed. Note that this measure requires that some figure for the total possible data sources be ascertained (and this may vary over time), and at any point in time (during the project), the number that have been analysed.

As another example, consider the question “Is there a training plan?”. This certainly invites the response of ‘Yes’ or ‘No’, and this response could be quite appropriate. However, it is also possible to look a little deeper, and ask associated questions about the quality (for example, in terms of completeness or adherence to standards). This illustrates a general family of questions that have a similar form: the primary question that can be answered with a simple ‘Yes’ or ‘No’, and associated questions that provide information about other characteristics that may be of interest. At this point, it is recommended that all possible questions, and their associated measures, be identified. For this example, the measures could be existence of a training plan, percent completeness of the training plan.

This also illustrates a characteristic of this process: iteration. Be prepared to revisit previous steps in need: here to add further questions to the set. Remember that the goal at this point is to identify all possible questions and their measures: a selection of those to be used in practice will be made later, based on pragmatic considerations.

Task completion criteria
A set of measures.

**Step 12 (Repeated): Refine Measures**

This step is repeated for every measure.

Although detailed here as a separate step, the refinement of the measures will usually be done as part of the previous task: with experience it becomes automatic. However, it is an important task, and needs to be discussed.

**Task 12A: Refine indicators**

**Description**

We are quite familiar with “indicators”: for those who drive, a common indicator is whether a door is open or the handbrake is on. In the sense used here, indicators are the same: they tell us whether a certain state of affairs exists, or not. Thus, they are typically binary in nature (like the indicators on a car). However, they can have a limited set of values in certain circumstances, and the use of multiple values can make this type of measure very useful. For those familiar with the Balanced Scorecard, the familiar red and green indicators can be supplemented with (say) orange.

**Relationship to previous tasks**

Improves the quality of the measures defined in the previous step.

**Entry criteria**

A set of measures.

**Details of Task and Example**
For each measure, determine if the set of possible values is discrete (that is, can be enumerated), or continuous (there is an infinite set of values). Indicators are the previous type, provided that the set of possible values is small (2 – 4 would be a typical set of values). In addition, it is useful to write a one-sentence definition of the indicator so that others can understand the meaning of the indicator.

For example, the measure *existence of a training plan*, has two values, ‘Yes’ and ‘No’, and is thus an indicator. On the other hand, the measure *number of issues raised last week*, while having a discrete set of values (they are integers), the set is not small, and thus the measure is not an indicator (it is a metric).

The description of the indicator should express what the indicator measures in (usually) business or technical terms, as an expansion of the name. It may be desirable to include the purpose of the indicator in the description.

Note that it is possible to define an indicator from a metric, and this may be desirable in some circumstances. This is done by defining a small number subsets of the set of possible values for the metric. For example, while the measure *number of issues raised last week* is a metric, we can define (say) three subsets: a set that indicates that “all is well” (say, 1 – 10), a set that indicates that things are “satisfactory, but requires monitoring” (say, 11 – 20), and a set that indicates that there is “trouble” (say, >20). We then have a measure of *issue status*, that has three discrete possible values, and is thus an indicator.

**Task completion criteria**

A definition and a set of values for each measure that is classed as an indicator.

---

**Task 12B: Refine metrics**

**Description**

Continuing with the car example, a metric is represented by the odometer: there is theoretically an infinite set of values (for the analog type), although in practice we would use a much smaller set.

This task is similar to the previous task, except that the goal is to define the set of values for each metric (but this not imply enumerating them).

**Relationship to previous tasks**

Improves the quality of the measures defined in the previous step.

**Entry criteria**

A set of measures.

**Details of Task and Example**

This is similar to the previous task: write a description and specify the set of values for each metric.

**Task completion criteria**

A definition and a set of values for each measure that is classed as a metric.
**Step 13 (Repeated): Validate measures**

As each task in this process is completed, there is the danger that each subsequent step causes the output of each step to move further away from where we started. This step is included to guard against this by introducing a reality check.

**Task 13: Relate measures to objectives**

Description

The objectives of the project are one of the key elements of the process described here, and so it is desirable that the indicators and metrics defined are able to be related to the objectives. Of course, they all should be, but sometimes it is possible to lose sight of what we are trying to achieve, and the process becomes an end in itself.

The task is therefore to ask the question “Does this measure make sense in the context of the project objectives?” Part of answering this will be to identify the objective(s) that a measure relates to.

Relationship to previous tasks

This task can be done at any time during the identification / refinement of the measures.

Entry criteria

A set of objectives and a measure.

Details of Task and Example

The use of measures in managing a project is a means to an end: the goal is to satisfy the project objectives. Therefore each measure must be able to shown to contribute to this goal (although it may be indirectly). This is a value judgement.

Take the measure *number of issues raised last week*. Although this example has not been derived from an actual objective in this manual, we can assume for sake of argument that the following objective exists:

To analyse, design and implement process improvements to the way client calls are administered and handled.

Is the measure relevant to the objective? In carrying out the analysis tasks associated with the objective, there will be some amount of communication between parties, and questions (*aka* issues) will be identified for resolution. As time goes on, it is desirable that the number of these issues decrease as the analysis nears completion: therefore the measure is relevant to the objective.

On the other hand, consider the objective:

To incorporate the requirements of the Privacy Act in systems design.

Is the same measure relevant to this objective? By a similar line of argument, it can be concluded that the measure is indeed relevant to this objective.

Some measures will apply to several objectives. This is a desirable state of affairs, as we are able to judge if several objectives are being met by measuring one characteristic of the project: this is cost-effective.

Task completion criteria

Assurance of the relevance of each measure, and an association between measures and objectives.
Chapter 5: Select Indicators and Metrics

If you have been following the process described above, you will by now have a large set of measures (indicators and metrics). A typical project may have up to fifty measures defined. The overhead involved in maintaining this number of measures is rarely justified: it can be costly, and there will in any case be some redundancy amongst the measures.

This part of the process is designed to ensure that the measures that are actually used in the management of a project are cost-effective and actually useful.

A word of warning. There is the danger that expediency reins at this point, and too many measures are thrown out, under the guise of budget and time constraints. Unless you are absolutely sure that a measure cannot add value, do not throw it out: the short-term saving may be at the cost of meeting project objectives. This is like deciding if your car tyres are correctly inflated by looking at the tyre profile instead of using a tyre gauge – most people think they can do it, but most people are wrong, and it can be a very expensive mistake.

Step 14 (Repeating): Assign priorities

This step is repeated independently for every measure.

This involves another value judgement: this time as to the relationship between the measure and the critical issues (or risks) faced by the project. It is not part of the process described in this manual to undertake a risk assessment, however this process is essentially one of risk management, so the identified project risks are important. Thus, the first task in this step is to assign a value for “importance” to each measure.

The second task in this step is to try to judge the cost of maintaining the measure. Again, this will be subjective, however will most likely be based on prior experience.

These two pieces of information are then combined to produce a final set of measures: those that are both important from a risk perspective, and cost-effective.

Task 14A: Assign importance

Description

Each project will have its own unique risk profile, and to some extent this will be reflected in the objectives (key risks are often identified through specific objectives). However, it should be apparent that many measures are defined in addition to those that are derived from key risk objectives. A judgement has to made as to whether these measures should be maintained and monitored.

Relationship to previous tasks

Provides a cross-reference between measures and key risks.

Entry criteria

A risk assessment for the project and a set of measures.
Details of Task and Example

The assignment of an “importance” rating depends on the risk assessment for the project. The following scale can be used:

5  High risk
4
3  Marginal risk
2
1  Low risk

The values are not in themselves important – it is the relative ranking given, and the need to be consistent.

As an example, take the measure *number of issues raised last week*. For a project that includes redesigning key procedures for a variety of users, this measure could attract a ranking of 4 or 5. For a project that is more concerned with replacing an existing system, then a ranking of 2 or 3 may be appropriate.

Task completion criteria

A ranking for each measure.

Task 14B: Assign cost

Description

This is similar to the above task, with the aim being to assign a relative cost of maintaining the measure.

Relationship to previous tasks

Assigns a cost weighting to each measure.

Entry criteria

A measure.

Details of Task and Example

As with the risk weighting, a scale can be used:

5  High cost
4
3  Average cost
2
1  Low cost

The goal here is to be consistent.

Task completion criteria

A cost weighting for each measure.
Step 15: Form final set

At the end of the day, the goal is a set of measures that will be used as an aid to managing the project. The analysis covered so far in this manual has been leading to this point.

Task 15: Define set

Description

There are two ways to define the final set of measures: one way based on intuition, and one way based on analysis. Both have their place, and one can be used as a check on the other. The analysis path is described here.

Relationship to previous tasks

Selects a set of measures for the project.

Entry criteria

A set of risk and cost weighted measures.

Details of Task and Example

Each measure is given a numeric score, based on the formula

\[
\text{Score} = \text{risk weight} \times \text{risk factor} + \text{cost weight} \times \text{cost factor} / \text{use factor}
\]

Risk weight and cost weight are allocated in the previous task, and is the highest value if a measure is assessed more than once (as may occur if a measure is used several times).

Risk factor and cost factor are chosen on a project-by-project basis, and are related to one another. They assign a relative importance to each of these factors. As a starting point, suggested values are:

\[
\begin{align*}
\text{Risk factor} & \quad 2 \\
\text{Cost factor} & \quad 1
\end{align*}
\]

Use factor is a count of the number of times a measure is used to satisfy more than one objective. For example, if a measure can be used for three objectives, this factor has the value ‘3’.

To complete this task, the measures are arranged in descending order of score, and the measures with the highest scores constitute the set of measures for this project. There is no “magic number” for the size of this set, however between 6 and 12 is a reasonable target.

Task completion criteria

The final set of measures.
Step 16 (Repeate): Identify data source and assign a reporting frequency

This step is repeated for every measure in the final set.

A measure is derived from base (or source) data. That is, it reflects some basic characteristic of the project, and this relationship has to be defined to enable the measurements to be made. Of particular interest is the quality (how reliable is the underlying data) and the currency (is it up to date).

Task 16A: Identify the data source and its quality and currency

Description

Some sources may provide a wealth of data, however the value of this data may be compromised by the fact that it is out of date. This does not imply that the measure should not be used, merely that this information about its currency should be understood by those using the measures. In a similar manner, some assessment of quality of the data (in terms of its reliability) needs to be made.

Relationship to previous tasks

Provides information for management about the measures.

Entry criteria

A measure and some knowledge about the environment of the project.

Details of Task and Example

As an example of this task, consider the measure number of issues raised last week. The source for this measure is likely to be an issues register (manual or automated), and should be accurate and current. Therefore, the reported measure can be afforded some weight in management deliberations.

On the other hand, the measure average team absentee rate, although derived from (presumably) accurate personnel records, may be one or two months late by the time it is reported. It needs to be interpreted with care.

Task completion criteria

For each measure, specification of the data source and an assessment of its currency.

Task 16B: Define frequency

Description

This task looks at how often each measure should be reported, and, indirectly, the maintenance schedule for the measure. Some measures have a high degree of volatility (and are likely to be current), and these should be reported more frequently than those that are inherently more stable.

Relationship to previous tasks

Can be undertaken when measures are defined.

Entry criteria

A measure and an understanding of the overall project management approach.

Details of Task and Example
This judgement is tied up with the overall project management approach to be applied to the project. If the standard reporting period is weekly, then it makes sense to report most measures on a weekly basis. However, even then, there will be some measures that are reported less frequently, possibly monthly.

Those measures that relate to key risks and are based on volatile base data should be reported more frequently than other measures. While cost may also be a factor in this decision, it should not override the imperative of risk.

For example, the measure *number of issues raised last week* may be a critical measure of task volatility and should be reported at least weekly.

Note that some measures may need to be reported on a daily basis, such as the measure *outstanding priority one issues* associated with user acceptance testing.

Task completion criteria
A specification of the frequency of reporting for each measure.
Chapter 6: Monitor Indicators and Metrics

In the context of a project, the tasks described in this manual are only the start. The real work is in using the metrics to better manage the project, and this requires planning and effort.

Planning is important, in that the maintenance of the measures should be part of the project management tasks undertaken by the project manager and others involved in the project. If the maintenance of the measures is integrated into the overall set of tasks, the cost of maintenance will be much less than if one-off exercises are undertaken to collect and analyse the data.

This chapter will be expanded to include examples of how the maintenance tasks can be undertaken in the project environment.
Chapter 7: A Final Word

The French Railway Ticketing System described earlier was implemented on schedule in February 1993. It was less than a runaway success (excuse the pun). Some of the problems included delays of up to 45 minutes to issue a ticket, total lack of knowledge of towns like Rouen and totally inaccurate prices. Trains passed through the French countryside virtually empty due to the system having incorrect loading data. Railway authorities suspended the requirement to have a ticket before boarding the train: they could be purchased on board. The result was that passenger traffic fell by almost 9% in the first nine months of 1993.

The reasons for this project going off the rails (sorry!) are many and varied, but the lack of a clear understanding of what had to be achieved is surely one of the more important.

To claim that the problems would have been solved by applying the process described in this manual is certainly not warranted. However, a clear understanding of the objectives, and the judicious use of key metrics would have helped.
APPENDIX H

Report on Questionnaire

This appendix contains the report on the survey of project managers as provided to the management of the host organization.
Summary

The main aim of the survey was to collect information about current project managers as part of the research being carried out into the use of metrics as a project management tool. Besides the demographic information, there were two parts to the survey. The first part (Section B) was a series of questions related to perceived attitudes and opinions of current practice. The second part (Section C) contained free-form questions on practices related to the current use of metrics in particular, and success/completion criteria in general.

A total of six responses were received from … project managers. Numerically this is a low number, but does represent a reasonable response rate of those asked to participate. Therefore, although the conclusions outlined in this report are probably representative, statistical validity for the results cannot be claimed.

The results from an analysis of Section B indicated that the … project group are seen (by themselves) as having reached the stage of having a set of common processes for the management of projects. On one scale of the development of project management within an organization, this is the second of five steps: the remaining ones are to have a singular methodology across the organisation, then to benchmark with other organizations, and finally to initiate a culture of continuous improvement throughout the organization. The major issue is that there is an expressed lack of confidence that line management is supportive of (or does not understand) the way projects are being managed.

An analysis of the responses in Section C show a commitment to planning of tasks and budgets, and the measurement of these, as a way to manage projects. In addition, there is an expressed commitment to risk management. However, there is a reported lack of involvement of the end-users in projects.

Overall, the results show a group moving towards a methodologically sound set of practices related to the management of projects. However, there is a need to look at the relationship between the project teams and the line units, both from the aspect of project management methodology, and the need to involve end-users in their projects rather than relying exclusively on business experts. There is also the opportunity to more explicitly use a range of measures, especially longer-term measures of success, to ensure that the organisation is achieving its best from the projects.
Comments on the Demographic Information

Note: respondents were assured that any identifying information provided on the survey would be removed prior to reports such as this one being prepared; consequently this section in particular is very general in nature, as it would be easy to identify individuals if specific instances were quoted.

Formal Qualifications
Most respondents had a Bachelors Degree, with an emphasis on computer science.

Training in Project Management
In-house short courses common, with some extended education at an advanced level.

Experience
Highly variable, ranging from less than six months in small projects, to many years over a variety of project sizes.

Project Type
The type of project was almost equally balanced between business-related projects and IT-development projects.

Background
Balance between the business analyst path and software development.

Summary
The characteristics are of a group that has sought to have a mix of experience and qualifications between the “technical” staff and the “business” staff. It is not clear whether individuals were recruited because of their experience, or because of their ability as project managers (although there is a relationship between these).
Comments on the Survey of Attitudes

The questions in Section B are taken from a text that describes the stages an organization goes through in establishing project management practices (Kerzner, H 2001 Strategic Planning for Project Management Using a Project Management Maturity Model, Wiley). Five levels of adoption are identified:

1. a common language for talking about projects and project management
2. a set of common processes, shared by a few groups
3. the adoption of a singular methodology across the organisation
4. the use of benchmarking to adopt best practices
5. a commitment to continuous improvement

There are a set of questions for each level, and the questions posed in the questionnaire relate to the second level. With this level, there are five life cycle stages.

The Embryonic Phase

This is the recognition of the need for project management, its potential value to the organization, how it can be applied to the business, and that change may be necessary. The survey indicates that this phase has been achieved.

Acceptance by Executive Management

This phase involves having visible executive support, demonstrated by an expressed understanding, sponsorship of initiatives and a willingness to change the way the company does business. The survey indicates that this phase has been achieved.

Acceptance by Line Management

This phase involves visible line management support, supported by commitment to project management and education, demonstrated by a willingness to have their employees involved in project management activities. The survey indicates that this has not been achieved.

The Growth Phase

This phase concerns the beginning of the development of a project management process for the organisation, indicated by a methodology, the use of project management software and a commitment to planning. The survey indicates that this has been achieved.

The Initial Maturity Phase

This phase indicates a readiness to progress, indicated by the adoption of a cost/schedule control system and the development of a project management educational curriculum. The survey indicates that this has been achieved.
Summary

The group appears to be moving towards the end of this second stage, in readiness for a move to a wider organizational use of project management techniques. However, the reported perception that there is little line management support is a matter for concern. It may be that there needs to more communication between the project managers and the line managers, and that there is in fact an understanding and support in the line divisions; or it may be that the line divisions are not supportive (or at least not aware of) the need for project management within the organization.

Comments on Current Practices

The questions in Section C were aimed at identifying practices related to the use of metrics in project management.

Completion Criteria (C1)
Time and cost were the most common criteria, with project-specific criteria being mentioned in some cases. The emphasis was on those criteria that could be estimated within the timeframe of the project. Measures related to how the end-user perceived the system were not mentioned explicitly: the emphasis was on process measures as identified by the project owners/sponsors. The time and cost criteria were quantified, as were some of the project-specific measures, but it was not uniform.

Measuring Progress (C2)
All respondents reported measuring progress. Cost and time versus budget and plan were the most common, with the measures judged as reliable. Other measures were seen as ad-hoc.

Risks (C3)
Risk assessment was done during project initiation, often in a workshop environment. Risks were monitored through regular reviews of logs. There were no common themes on what the major risks were.

People Involved in Project (C4)
Two major types of involvement: specialists (typically IT), and business. Communication channels (team meetings, documents) were the most common way of managing the diversity of people involved. The most interesting outcome of this question was that the real end-user (rather than the business owner or manager of the function) was not mentioned as being involved in the project: reliance appeared to be placed on the experts from the area affected by the project being able to interface with the project team.

Management of People, Task and Risk (C5)
Management of communication received a major vote as being important, with quality, relationships and sponsorships also being mentioned. No agreement as to the most important.

Measures Used (C6)
There was no agreement as to extra measures beyond those listed in C2.
Summary

There were four items of interest to emerge from these questions: a strong commitment to the use of budget and plans as a way of managing progress, a clear recognition of risk as an important part of the overall project management task, a reliance on time and cost as prime measures, and, possibly less positively, a lack of involvement of users in projects, especially in the initial stages (requirements definition). The first three of these are related to internal processes, and reflect an emerging project management methodology. The last is also related to how the projects relate to the organisation as a whole, and this may need some development.
Interpretation of the Results

Note: The reader is again cautioned about inferring too much from the small number of respondents to the survey.

Internal Processes

The results of the questionnaire (Section B) and the open questions (Section C) support the view that current project management practice is at the stage of establishing common procedures, and that the project managers are adopting these procedures. From the survey, it is apparent that the project managers recognise the importance of these procedures, and the use of the project charter and initial planning with the business owner are used well.

External Relationships

There are two aspects to this: relationships with executive management and relationships with the business clients. There appears to be support forthcoming from senior management for the project management practices being implemented, and this relationship needs to be cultured to provide a sound base for the next stage of introducing project management practices. On the other hand, there appears to be some concerns with the relationships with the line managers. The questionnaire reveals a lack of confidence in this relationship, and the reported lack of involvement of the end-users in the projects is tangible evidence of this. As one of the key success criteria for projects (as identified in the research literature) is the degree of involvement of the end-users, this is an area that needs to be addressed.

Use of Measures

There appears to be a reliance on cost and time measures as the prime means of judging progress in a project, reflecting the importance of these criteria as success measures. It may be productive to expand the definition of “success”, to explicitly include such things as quality, useability, long-term business benefits, and so on. (However, this is linked to the issue of external relationships, above.) This is also related to the level of the organisation that sets the criteria: on one hand the project team may be focused on the next project to be undertaken, whereas the executive may be more concerned with longer-term objectives. These are not incompatible, but they do need to be explicitly recognised. In addition, cost and time are essentially “historical” measures, and by the time that deviations are detected, there may be schedule and budget impacts: the use of proactive measures alongside cost and time measures may offer one way to address this.
APPENDIX I

First-Order Coding

This appendix contains the coding categories that were used to undertake the first-order coding of the cases used in the meta-study.
APPENDIX J

Second-Order Coding

This appendix contains the coding categories that were used to undertake the second-order coding of the cases used in the meta-study.
APPENDIX K

Analysis of First-Level Coding
### Analysis of First-Order Coding

<table>
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References


CONSTITUENTS AND THEIR EXPECTATIONS:
TOWARDS A CRITICAL-PRAGMATIC THEORY OF
INFORMATION SYSTEMS PROJECT
MANAGEMENT

Phillip William James Brook
BSc  DipCS

University of Western Sydney

Submitted as fulfilling the requirements for the Doctor of Philosophy Degree

March 2004
Certificate of Originality

I hereby declare that this dissertation is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person, nor material which to a substantial extent has been accepted for the award of any degree or diploma of the University or other institute of higher learning except where due acknowledgement is made in the text.

I also declare that the intellectual content of this thesis is the product of my own work, even though I may have received assistance from others in style, presentation and language expression.

Signature ____________________________

R. Brook
Acknowledgements

First and foremost my appreciation for all her efforts go to Dubravka Cecez-Kecmanovic, whose continual encouragement to undertake doctoral studies has finally borne fruit. Thanks also to Alan Buttery for his support and encouragement, and to Owen Hanson who was a willing sounding board for what I wanted to say.

The members of the Information Systems and Knowledge Management Research Group provided a supportive environment in which I could present and refine my ideas, so to them I also extend my appreciation.
Abstract

This dissertation presents a theoretical model of information systems (IS) project management that aims to improve the rate of project success, estimated currently to be less than 50% despite over thirty years of experience. IS project management has traditionally adopted the practices developed for engineering projects, focusing on tasks, tools and techniques, driven by the project team. The end-users, although consulted to elicit their requirements, are seen as outside the project team, a resource to be accessed by the project team. The result is delivered systems that do not meet the needs and expectations of those who have to use them in practice. Failure is the likely outcome.

The inquiry into IS project management and the development of the CED Model of IS Project Management presented in this dissertation were informed by critical social theory and pragmatics. IS projects are conceptualised as a collaborative undertaking by everyone affected by the project: the constituents. The model identifies the central role of constituents’ expectations and their critical examination of the intended, desired and feared outcomes. This examination is facilitated by a project discourse and active knowledge sharing leading to intersubjective understandings of the future IS. The model emerged from practice through an action research project located in an international insurance company, and was tested and developed further through a meta-study using government audit reports of ten large IS projects (from the US, UK and Australia).

By being based in the political, economic, technical and social dimensions of IS projects, this dissertation makes a theoretical contribution to the IS discipline. Furthermore, by establishing a set of prescriptions for how a project should be conducted by identifying who should take part (the constituents), how they should interact (engaging in the project discourse) and how the processes should be managed (driven by the constituents’ expectations), the model provides guidance for IS practitioners to increase the likelihood of successfully implementing the project. From a research perspective, this dissertation presents an example of empirically grounded IS research, informed by critical-pragmatic theoretic concerns, that is highly relevant for IS practice.
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I  First-Order Coding
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## Abbreviations

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<th>Description</th>
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<tr>
<td>APM</td>
<td>Association for Project Management</td>
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<tr>
<td>CED</td>
<td>Constituency / Expectations / Discourse</td>
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<tr>
<td>CST</td>
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<td>IT</td>
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<td>Project Management Institute</td>
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Glossary

Note: the concepts underlying each definition and the reasons why each term is defined as it is can be found in the section of this chapter as indicated.

Collaboration: members of a project team working together in order to achieve project outcomes; specifically, accepting that the responsibility for achieving project outcomes is the joint responsibility of those who will be affected by the project and those assisting with achieving the outcomes (typically the technical development staff). See Section 2.4.

Consultation: the relationship between members of the development team and those affected by the outcome of the project; a consultative approach implies that the opinions, needs and concerns of those affected by the project outcomes are genuinely considered by the development team, although the power to make a decision if conflict arises typically rests with the development team. See Section 2.4.

Information system (IS): a set of definitions, protocols, relationships, data and technology that enables people in an organizational setting to share ideas, beliefs, concepts, data and information. See Section 2.3.

Instrumental viewpoint on the role of people in IS system development: assumes people are a resource for the technical development staff; input from these people is sought only if the technical development staff consider that these people have information relevant to the task at hand. See Section 2.4.

IS development: those activities that are involved in the creation or modification of an information system; traditionally undertaken by technical staff organized as a project team that commences with requirements elicitation and concludes when the system is migrated to the operation environment. See Section 2.8.
**IS project**: an organizational arrangement that brings together under one management scheme those involved in any activity related to information systems within an organization; this includes the formulation of the initial idea and conducting the feasibility study, (possibly) leading to a development phase and commissioning of a system into operation.

**IS project management**: the principles, tools and techniques used to take an IS project from conception to termination.

**Management model**: a set of principles, guidelines and heuristics used as a basis for the approach used to manage activities within an organization; examples include Total Quality Management (TQM), the managerial grid, network analysis, SWOT analysis. See Section 2.10

**Social-intervention**: a philosophical view on the role of information systems within an organization that considers IS as being primarily concerned with how people interact and carry out their tasks; a major focus is the relationships between people (their ideas and beliefs) and their use of information, and the role of technology as a facilitator of these relationships. See Section 2.4.

**Socio-technical view of the role of information systems**: a philosophical view that considers IS to be a combination of both people (organizational) issues and technology-related issues; the focus is on how these two sets of issues interrelate. See Section 2.4.

**Success and failure of IS projects**: a contextual judgement made on the extent to which a particular project did or did not meet their expectations; different people may arrive at different conclusions, depending on their point of view. See Section 2.3.

**Technocratic view of the role of information systems**: a philosophical view that considers IS to be first and foremost an issue related to the use of technological artefacts in an organizational setting; the focus is on how these artefacts are created and used. See Section 2.4.
Users: those who will interact on a regular basis with the information system; to be distinguished from clients who are the initiators of IS projects.

It is useful to define what is meant by 'research method', as some terms have multiple meanings, depending on the context. In the context of this dissertation, the following four terms are used (Myers 1997):

**Philosophical approach:** the underlying assumptions about what constitutes research, and the methods appropriate to those assumptions; examples include positivism and critical theory. See Section 3.2.

**Research method:** the strategy adopted to answer the research questions; a particular research method may be applicable to several philosophical approaches; may involve one or more data collection and analysis techniques; examples include ethnography and action research. See Section 3.3.

**Data collection techniques:** specific ways of collecting data consistent with the research method and situation; examples include interviews and surveys. See Section 3.3.

**Data analysis techniques:** specific ways of analysing data consistent with the research method and situation; examples include statistics and content analysis. See Section 3.3.