The Evaluation of Information Technology Projects:

A Study of Effective Practices

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by

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Declaration

I certify that the work presented in this thesis is, to the best of my knowledge and belief, original, except as acknowledged in the text and that the material has not been submitted, either in whole or in part, for a degree at this or any other university. I also certify that, to the best of my knowledge, any help received in preparing this thesis and all sources used have been acknowledged in this thesis.

This thesis was edited by Dr Lisa Lines, and editorial intervention was restricted to advice on language, completeness and consistency of expression, in accordance with Standards D and E of the *Australian Standards for Editing Practice*. The editor provided this advice for consideration only and it was my decision to adopt or reject each piece of advice. Therefore, I assume the sole responsibility for the entire content of this thesis.

Signed:

Graeme Robert Thomas
1 November 2010

Acknowledgments

'It's not the mountain we conquer but ourselves' (Edmund Hillary).

The completion of this research thesis has been like climbing a mountain—lonely at times but not achieved without a large support team.

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Finally, thanks most of all to my wife Jean for her love, patience, understanding and support. Jean has been by my side every step of the way, working hard to support me and encouraging me to continue. I would have been lost without you.

Abstract

The topic of IT project evaluation is important due to the high cost and strategic importance of many IT projects and long-standing difficulties with their evaluation. While it is widely recognised that the evaluation of IT projects is problematic, there is limited research into *how* organisations can improve their evaluation practices. The literature supports the divergent views that current IT project evaluation practices are inadequate, more formal and rigorous methods are required, a wide range of techniques is already available, yet very few of the currently available techniques are used in practice. However, there is very little empirical research into what constitutes an *appropriate* level of formality or rigour, or what specific practices are necessary for evaluation to be effective.

This study set out to identify the most effective IT project evaluation practices used by organisations in Australia, and to understand why they work. This exploratory study follows a qualitative *theory-building* paradigm, where the emerging theory helps explain what is happening in practice. Qualitative analysis of interviews with 72 senior managers in 36 companies in three industries was used to determine effective evaluation practices. Six key dimensions of effective IT project evaluation practice were found to be related to effective IT project evaluation outcomes leading to more efficient use of resources and improved IT project success.

The six dimensions were as follows. First, evaluation was effective when there was top-leadership commitment and business engagement. Second, a clear focus was achieved during *ex-ante* evaluation by aligning projects to strategy and having an agreed definition of project success. Third, control at both a project and portfolio level was enabled by stage gates, portfolio management and dedicated resources. Fourth, effective evaluation processes were scaled to balance governance and responsiveness. Fifth, evaluation and measurement were continuous and integrated. Finally, the use of evaluation results and accountability reinforced the effectiveness of evaluation practices. While these concepts may be discussed in isolation in the extant IT project management literature, few studies present them in an integrated manner and relate them to effective IT project evaluation outcomes and IT project success.

The key finding of this study is that more formal evaluation is not necessarily better. In the 36 case study companies, some level of formality helped improve evaluation and, ultimately, IT project outcomes. However, evaluation processes that were too formal were ineffective,

resulting in dysfunctional behaviour. Whilst regular evaluation across the project lifecycle was the goal of most companies, the key issue was one of implementation of that intention. Many companies had well-documented processes and methods, but they were not applied consistently. Thus, formal processes and methods alone were not enough. It was only when all of the effective practices *were combined* that positive behaviours were reinforced, actions were aligned, and evaluation processes were *most* effective.

This research contributes to theory development by presenting a substantive theory of effective IT project evaluation grounded on rich empirical data. The theoretical model developed addresses important gaps in the literature, in particular by identifying which practices are most effective, integrating a range of concepts and relating effective practices to IT project success. This contribution is important due to the lack of recognition to date of effective IT project evaluation practices. The practices identified in this study also provide the foundation for further research into IT project evaluation practices, and the relationships between these practices and project success. These conclusions provide important insights for improving IT evaluation practices, and ultimately, IT project outcomes, both in Australia and around the world.

Peer-reviewed Publications

This research has contributed to the following peer-reviewed publications:

Thomas, G. (2006). 'Lies, damned lies and E-business: can evaluation save Australian organisations from the IT cowboys?' Australasian Journal of Social and Business Enquiry **4**(2): 64–83.

Thomas, G. (2007). 'The evaluation of information technology projects: a study of effective practices.' Appendix to the Eleventh Pacific-Asia Conference on Information Systems Doctoral Consortium: 18–24.

Thomas, G., P.B. Seddon and W. Fernández (2007). IT project evaluation: is more formal evaluation necessarily better? Proceedings of the Eleventh Pacific-Asia Conference on Information Systems, Auckland. *(Best Paper Nomination)*

Thomas, G. and W. Fernández (2007). The elusive target of IT project success. eProceedings of the 2nd International Research Workshop on IT Project Management (IRWITPM), Montreal. *(Best Paper Award)*

Thomas, G., P.B. Seddon and W. Fernández (2008). IT project evaluation: why more formal evaluation is not necessarily better. Evaluating Information Systems: Public and Private Sector. Z. Irani and P. Love. Oxford, Butterworth-Heinemann: 78–98.

Thomas, G. and W. Fernández (2008). 'Success in IT projects: a matter of definition?' International Journal of Project Management **26**(7): 733–742.

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List of Abbreviations

AFE	Application for Expenditure
ANZSIC	Australian and New Zealand Standard Industrial Classification
BCS	Benefits Capture System
CAPEX	Capital Expenditure
CEO	Chief Executive Officer
CER	Capital Expenditure Request
CFO	Chief Financial Officer
CGM	Chief General Manager
CIO	Chief Information Officer
CIP	Capital Investment Procedure
EG&WS	Electricity, Gas and Water Supply
ERP	Enterprise Resource Planning
EVM	Earned Value Management
F&I	Finance and Insurance
GM	General Manager
ICT	Information and Communication Technology
IRC	Investment Review Committee
IS	Information Systems
IT	Information Technology
ITSC	IT Steering Committee
KPI	Key Performance Indicator
MEP	Major Expenditure Proposal
NOIE	National Office for the Information Economy
OPEX	Operational Expenditure
P&L	Profit and Loss
PDA	Project Delivery Assessment
PDM	Project Delivery Methodology
PIP	Project Initiation Proposal
PIR	Post-implementation Review
PMO	Program Management Office
PPG	Project Prioritisation Group
QDC	Quality, Delivery and Cost
TOR	Terms of Reference

CHAPTER 1 RESEARCH OVERVIEW

1.1 Introduction

Evaluation decisions about the feasibility, relative priority, and impact of information technology (IT) projects are important given their high cost and strategic importance (Smithson & Hirschheim 1998; Irani et al. 2005). However, despite the extensive literature on IT evaluation (Irani & Love 2001a, 2002), organisations appear no nearer to a meaningful evaluation solution than they were over a decade ago (Ballantine & Stray 1998). Long-standing difficulties with evaluating IT projects are also exacerbated by a rapidly changing business environment and a high degree of uncertainty regarding IT project outcomes (Patel & Irani 1999; Melville et al. 2004). IT projects continue to experience high failure rates (Lubbe & Remenyi 1999; Love et al. 2005).

A series of 36 mini-case studies was conducted in three industries in Australia in an effort to gain a better understanding of which IT evaluation methodologies and practices are being used today, their relative effectiveness, and what value they bring. The primary research question was as follows:

How can organisations improve the evaluation of IT projects?

This chapter sets the scene for this study into the evaluation of IT projects. It explains the research problem, associated research questions and scope, and outlines the structure for the thesis. This chapter is organised as shown in Figure 1.1.

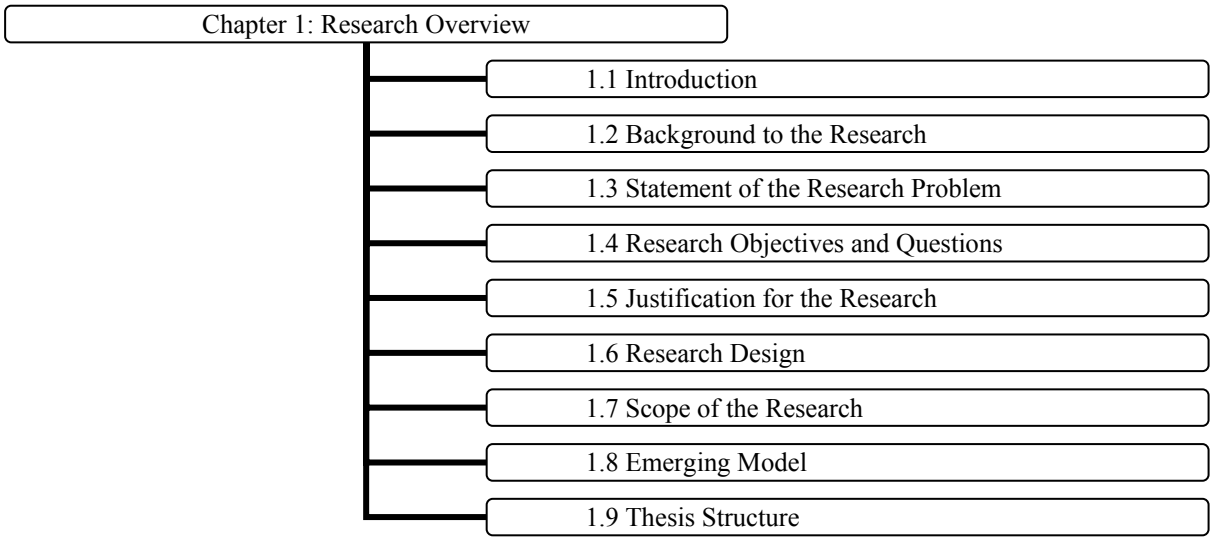

Figure 1.1: Chapter 1 outline

1.2 Background to the Research

Evaluation is 'the process of providing information designed to assist decision making about the object being evaluated' (Owen 1993, p.3). Evaluation is a key part of effective IT governance, indicating how limited resources will be allocated to competing IT projects to derive the best value for the organisation (McKay & Marshall 2004). Thus, IT project evaluation is a technique or a set of techniques that facilitates decision making across the project lifecycle with the goal of achieving the best outcomes for the organisation (Smithson & Hirschheim 1998; Remenyi & Sherwood-Smith 1999; Irani et al. 2005). Since IT evaluations may be conducted either prior to investment, during project delivery, or after the project is complete, IT evaluation includes both *predictive evaluations* (*ex-ante*) and *prescriptive evaluations* (*ex-post*) (Remenyi & Sherwood-Smith 1999).

Predictive evaluations are used to predict the feasibility, cost and impact of proposed IT investments. Typically, predictive evaluations are used to: inform IT investment decisions, compare the merit of different projects, provide a set of measures to inform improvement efforts, and to obtain commitment for the project (Farbey et al. 1992; Remenyi & Sherwood-Smith 1999). By contrast, prescriptive evaluations are typically conducted to assess the performance of the project, the impact of the system, and to learn lessons for further process improvement. For example, post-implementation reviews are prescriptive evaluations conducted after the project has been finalised. The purpose of post-implementation reviews is to provide a comparison of planned with actual achievements, to learn how well resources have been used, and to improve the selection and management of future IT investments (Farbey et al. 1992). In addition, the process of benefits realisation involves *both* predicting and planning for benefits from IT projects, and then actively tracking and managing them for improvement (Lubbe & Remenyi 1999). While benefits realisation spans the lifecycle of a project, it is most prominent after project implementation (Farbey et al. 1999b).

It seems reasonable to expect a positive correlation between effective evaluation practices and project success since the purpose of project evaluation is to inform action, enhance decision making and apply knowledge to solve problems (Patton 1990). Thus, the high rate of IT project failure has been partly attributed to a lack of management tools for evaluating, prioritising, monitoring, and controlling IT investments (Hochstrasser 1992). This presumed causal connection between evaluation and success has resulted in numerous studies on methods and criteria for IT evaluation, and in a myriad of tools and techniques for predictive

evaluations (Irani & Love 2001a). However, there is an overall lack of consistency in IT evaluation research with inconsistent definitions, dependent variable ambiguity and variations in the type of impact measured (Cronk & Fitzgerald 1999; Melville et al. 2004). The extant literature supports the view that the use of formal processes, defined procedures, and frequent points of evaluation are generally related to more effective evaluations (Tallon et al. 2000; Irani & Love 2001a; Alshawi et al. 2003).

Good decision making regarding IT investment is particularly important for those organisations that use IT for strategic purposes. In such organisations, Tallon et al. (2000, p.154) argue that 'there is an even greater need for these investments to undergo routine, systematic and recurring evaluation'. Further, based on an Australian survey of 81 senior executives, Sohal and Ng (1998) found that the potential of IT has not been met due in part to IT strategy not being aligned with business objectives, and inadequate and inappropriate evaluation of proposed IT investments. Alshawi (2003) and Love et al. (2004) also conclude that organisations need to undertake more systematic and rigorous evaluation processes before implementing IT if they are to achieve improvements in business performance. It appears that many companies do not use formal evaluation processes nor collect sufficient information concerning IT performance despite such evidence and strong academic arguments for more systematic evaluation of IT projects (Ballantine et al. 1996b; Willcocks & Lester 1997; Lubbe & Remenyi 1999; Bannister & Remenyi 2000).

While organisations normally carry out some form of predictive evaluation as part of a feasibility study, investment appraisal, or business case (Smithson & Hirschheim 1998; Irani & Love 2001a), it seems that post-implementation evaluations and benefits realisation are rarely carried out (Sohal & Ng 1998; Seddon et al. 2002; Lin et al. 2005). For example, Remenyi and Sherwood-Smith (1999, p.15) state that 'ongoing evaluation of information systems projects, once the projects are initiated, is generally not carried out with sufficient frequency or attention to detail'. Similarly, Lin and Pervan (2003, p.14) state that 'much attention is paid to ways of justifying investments, with little effort being extended to ensuring that the benefits expected are realised'. Thus, empirical evidence of post-implementation evaluations seems to contrast with the perceived value of the practice as espoused in the literature (Irani 2002).

One reason that formal evaluation methods are not widely or consistently adopted by organisations may be the host of practical difficulties with IT evaluation. Studies have

consistently found that the identification and quantification of relevant costs and benefits is a major problem for IT project evaluation (Willcocks 1992; Ballantine et al. 1996b; Seddon et al. 2002; Alshawi et al. 2003). This problem arises because cost and benefits change and evolve over time (Remenyi et al. 2000), some IT benefits tend to be intangible (Seddon et al. 2002), and IT projects are often complex (Melville et al. 2004).

These difficulties in measuring benefits and costs are often the cause of uncertainty about the expected impact of IT, and result in a low perceived value of evaluation and poor evaluation practices (Irani & Love 2001a). Consequently, organisations may decide not to use formal evaluation methods, either *ex-ante* or *ex-post*, since they are considered too difficult or costly to implement (Lin et al. 2005), often involving many political agendas (Smithson & Hirschheim 1998; Irani & Love 2001a). In other cases, managers simply do not understand the importance of the investment evaluation process or the concepts involved (Willcocks & Lester 1997; Remenyi et al. 2000). Ballantine et al. (1996b) also identify organisational problems that hinder the evaluation process—such as lack of time, limited management support, and no defined responsibilities.

In short, the literature supports the divergent views that current IT project evaluation practices are inadequate, more formal and rigorous methods are required, a wide range of techniques is already available, yet very few of the currently available techniques are used in practice (Bannister & Remenyi 2000; Irani & Love 2002). There is very little research on what constitutes an *appropriate* level of formality or rigour, or what specific practices are necessary for evaluation to be effective. According to Ballantine et al. (1996b, p.139), for instance, 'the role of formal procedures in the IS/IT evaluation process needs to be more closely examined to identify whether their use results in any significant benefits'. To meet this challenge, this study takes a holistic and systemic view of IT project evaluation. Its goal is to identify effective practices and understand why they work.

The review of IT project evaluation literature in Chapter 2 shows that while there is extensive research on IT project evaluation methods and challenges, there is limited understanding of which evaluation practices are most effective and why they are effective.

1.3 Statement of the Research Problem

Companies are uncertain as to what value they are getting from IT projects. While the problems with evaluating IT projects are well documented (Willcocks 1992; Ballantine et al. 1996b; Smithson & Hirschheim 1998; Irani 2002; Seddon et al. 2002), the solutions proposed in the literature do not appear to be adopted in practice (Ballantine & Stray 1998). Therefore, there is a noticeable gap between academic *theory* and actual evaluation *practice* in organisations. Organisations appear to be no nearer a solution to meaningful evaluation than they were over a decade ago and IT projects continue to experience high failure rates.

As a result, there is a need for further research to develop theoretical frameworks targeting the improvement of IT project evaluation practice.

1.4 Research Objectives and Questions

The objectives of this research are twofold:

1. To contribute to theory by building a framework explaining IT project evaluation; and
2. To assist organisations to improve the evaluation of IT projects by identifying effective practices.

Following from these objectives, this empirical study aims to contribute to the body of knowledge by answering the following question:

How can organisations improve the evaluation of IT projects?

To achieve this aim, four sub-questions were also posed:

1. How do organisations evaluate IT projects?
2. To what extent do organisations formally evaluate IT projects and why?
3. How do organisations define IT project success?
4. What are the most effective IT project evaluation practices used by organisations and why are they effective?

The first and second sub-questions address the need to update understanding of current IT project evaluation practices in organisations. The third sub-question addresses how IT project success is defined in practice since a relationship may be expected between effective

evaluation practices and project success. Finally, the last sub-question addresses the extension of theory to identify effective practices and ultimately assist organisations to improve the evaluation of IT projects.

1.5 Justification for the Research

This research addresses an important gap in the IT project evaluation literature (discussed in Chapter 2). To the best knowledge of the researcher there has been no comprehensive and systematic research into what practices are necessary for IT project evaluation to be effective and why they are effective.

The research is justified for a number of reasons. First, the high cost and strategic importance of many IT projects means that evaluation of these projects is important (Smithson & Hirschheim 1998; Lee 2004). Second, IT projects continue to experience high failure rates (Love et al. 2005). Third, current IT project evaluation practice is inadequate (Irani & Love 2002). Finally, the literature is lacking in substantive theories of effective IT project evaluation practice grounded in empirical data (Serafeimidis & Smithson 2000).

The questions posed by this research are of interest, significance and value for both research and practitioner communities (Darke et al. 1998). In particular, improvements to the evaluation of IT projects may lead to more efficient use of resources and improve the rate of IT project success.

This study contributes new knowledge with respect to:

1. What is known about IT project evaluation;
2. Understanding of IT project success;
3. Understanding of the relationship between IT project evaluation and project success; and
4. Researchers' understanding of current evaluation practices.

The research outcomes from this study provide an important contribution to understanding how IT project evaluation is conducted and how it can be improved. The proposed framework for improving the effectiveness of project evaluation practices in an organisation is a new model that extends upon current theory. This research contributes to improving IT evaluation practices, and ultimately, improving IT project outcomes. The practices identified in this

study also provide the foundation for further research into the relationships between project evaluation practices and project success.

1.6 Research Design

The overall approach of this exploratory study follows a qualitative *theory-building* paradigm (Eisenhardt 1989). Mini-case studies were conducted in selected companies to acquire data and coding techniques borrowed from the grounded theory methodology were used for conceptualisation (Glaser & Strauss 1967; Glaser 1978). The approach adopted allowed an exploration of project evaluation grounded in rich empirical data, as recommended by Orlikowski (1993). This is a good strategy for discovery, offering a 'strong potential for revealing complexity' (Miles & Huberman 1994, p.10). This approach was also desirable because it aligned well with the need to achieve relevance and a desire to conduct rigorous qualitative research (Fernández & Lehmann 2005). The primary unit of analysis in this study is the organisation. The higher industry level and lower project level were considered for context.

Three Australian industry sectors were selected: Finance and Insurance (F&I); Mining (M); and Electricity, Gas and Water Supply (EG&WS), as classified by the Australian and New Zealand Standard Industrial Classification (ANZSIC). These sectors offered varying levels of IT investment and seemed likely to cover a range of evaluation practices. Seventy-eight in-depth interviews were conducted with 72 senior managers in 36 companies operating in these industry sectors. The sample of companies was derived from a combination of purposeful, opportunistic and snowball sampling, which is relevant for theory building (Miles & Huberman 1994). The mix of participant companies selected represents a diverse range of organisations in terms of size, focus of operations, and ownership.

The interview process investigated evaluation at various stages of the project lifecycle, both *ex-ante* and *ex-post*. The interview format had two parts. Since the interview was the primary source of data, care was taken to ensure that the person(s) selected were the most appropriate for each part of the interview. The primary interview was with a Chief Information Officer (CIO), program office manager or equivalent. This interview focused on evaluation practices in the participant company in general. A secondary interview was then conducted with a project manager and explored evaluation of a recently completed IT project. Participants' perceptions were used as a reasonable proxy for objective measures; perceptions having been

found to correlate strongly with objective measures in research of IT business value (Tallon et al. 2000). Additionally, 362 documents relating to project management and evaluation practices were collected and analysed for contextual, informational and triangulation purposes, following Yin (2003).

The 36 companies were first individually analysed based on the interviews and sample documents. Responses to questions on *satisfaction with IT evaluation processes* and *confidence that IT projects are producing business benefits* were used to assess both effective and ineffective practices. Interview notes were analysed to determine effective IT project evaluation outcomes based on participant descriptions of the strengths and weaknesses of their company's evaluation practices. Effective practices were contrasted with ineffective practices. In addition, all practices were examined for their ability to address the significant evaluation challenges identified by the participants. While the general approach was to look for patterns in practices, it was also recognised that effective practices might come from a single company. Both similarities and differences were examined across companies.

Chapter 3 provides a detailed description of the research design.

1.7 Scope of the Research

Boundaries were important considerations in the design of the study as suggested by Miles and Huberman (1994).

This study focuses on the evaluation of IT projects as expressed by current theory and demonstrated by practices in 36 Australian companies in three industry sectors. This study explores evaluation across the lifecycle of IT projects, covering both *ex-ante* and *ex-post* evaluations. The theoretical focus is around models or frameworks for effective IT project evaluation, that is, evaluation practices that result in improved evaluation outcomes and improved IT project success. The scope of the research does not include examination of the connection between evaluation practices and company performance. The research emphasis is on how IT project evaluation is currently approached and how it can be improved. Thus, the research has an applied orientation directed at improving practice (Keen 1987).

The goal of this research is theory building, not theory verification. The findings from this exploratory study are based on empirical evidence from 36 companies in three industries in

Australia. The case-based study explored *real-life* projects in order to achieve conceptualisations grounded in professional practice, not to achieve generalisation. Yet, since the companies in this study are a diverse range of organisations by size, focus of operations and ownership; and the practices identified are related to management issues known to be important the world over, the findings could apply to other organisations due to the 'representativeness' of the sample (Seddon & Scheepers 2006) and the level of abstraction (Glaser 2001). Further research is required to verify these results and to extend them into other industry types.

Limitations of the research design are discussed in detail in Chapter 3. Chapter 4 summarises the evaluation practices of each of the 36 case study companies.

1.8 Emerging Model

Across the 36 companies, six key concepts of effective IT project evaluation practice emerged: commitment, focus, control, scale, integration and action. These dimensions were found to be related to effective IT project evaluation outcomes leading to more efficient use of resources and improved IT project success. Underlying these dimensions were a range of effective practices. In particular, it was when these effective practices were *combined* that positive behaviours were reinforced, actions were aligned, and evaluation processes were accurate, responsive and consistent. The theoretical model that emerged from this study is represented in Figure 1.2.

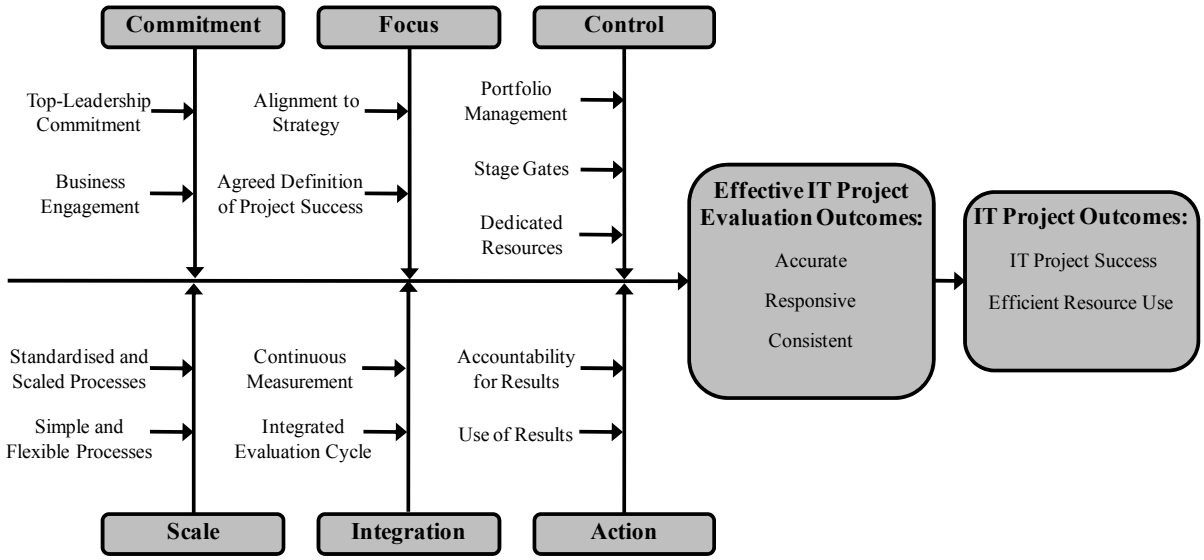

Figure 1.2: The emerging theoretical model

Chapter 5 presents the emerging theory and a new theoretical model for improving IT project evaluation practices. It explains in detail each of the six key concepts of effective IT project evaluation. While these concepts may be discussed in isolation in the extant IT project management literature, few studies present them in an integrated manner and relate them to effective IT project evaluation outcomes and IT project success.

1.9 Thesis Structure

This thesis is structured into seven chapters.

Chapter 1 sets the context for this research thesis by presenting the background to the research, its focus and the significance of the study.

Chapter 2 summarises the literature on IT project evaluation, project success and effective evaluation practices. A conceptual framework is presented that explains the key constructs to be explored in the study. The literature review provides the foundation for the research questions and research design.

Chapter 3 justifies the research paradigm adopted and describes the research method used to identify effective evaluation practices. The chapter explains the selection of the research method, data collection, data analysis, limitations and ethical considerations.

Chapter 4 provides an overview of results and presents summary descriptions of the evaluation practices in each of the 36 case study companies. The individual cases serve as the evidentiary base for the study.

Chapter 5 summarises the cross-case comparison, and presents a new theoretical model of effective IT project evaluation practice.

Chapter 6 discusses the emerging theory in relation to the extant literature. This chapter identifies gaps between current theory and practice.

Finally, Chapter 7 synthesises the concepts discussed in earlier chapters to draw conclusions, summarise the contribution of the thesis, identify implications for theory and practice, discuss the limitation of the study, and suggest areas for further research.

CHAPTER 2 LITERATURE REVIEW

2.1 Introduction

The purpose of this literature review is to survey the academic and practitioner literature on IT project evaluation, its relationship to IT project success and how the evaluation of IT projects can be improved.

Given the high level of investment and strategic importance of many IT projects, evaluation decisions about the feasibility, relative priority, and impact of these projects are important to many stakeholders (Smithson & Hirschheim 1998; Remenyi & Sherwood-Smith 1999; Lee 2004; Irani et al. 2005). Thus, IT project evaluation is an extensively studied topic (Irani & Love 2001a, 2002) that continues to show that organisations face considerable challenges in terms of evaluating IT projects (Ballantine & Stray 1998; Irani & Love 2008) and achieving project success (Lubbe & Remenyi 1999; Love et al. 2005).

The literature review aims to:

- Summarise academic research on the topic of IT project evaluation;
- Identify themes or propositions arising from the literature;
- Reveal gaps in the research that lead to the research problem and questions; and
- Define the boundaries of the research through development of a conceptual framework.

To achieve these objectives the literature review is structured as shown in Figure 2.1.

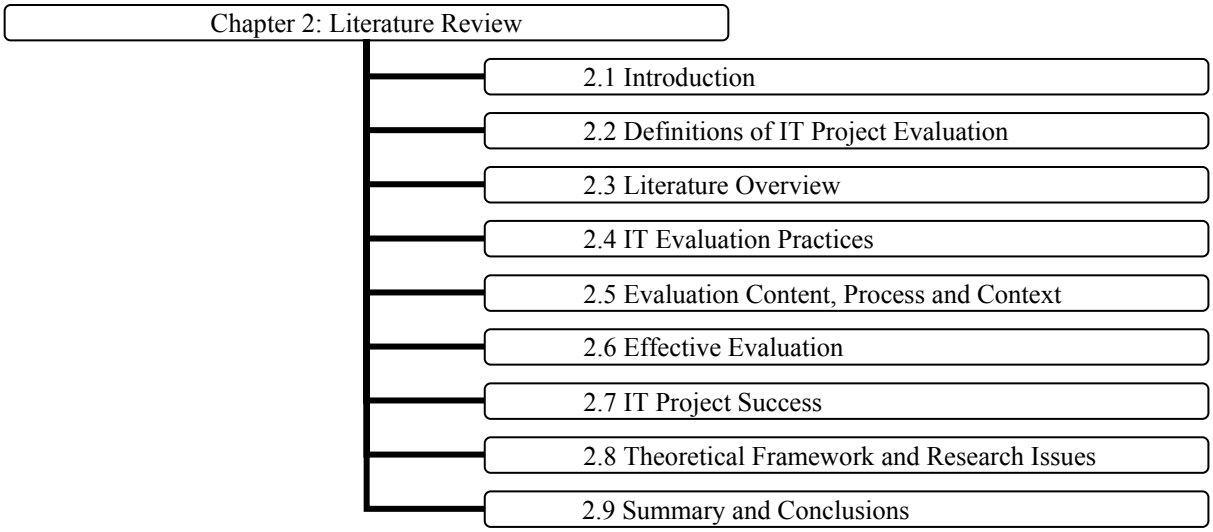

Figure 2.1: Chapter 2 outline

First, this chapter defines evaluation and the purpose of evaluation. Next, the literature is reviewed to describe current IT project evaluation practices, challenges and barriers. In order to better understand evaluation, key themes from the literature are described in terms of the stages of IT project evaluation and then by the content, process and context of evaluation. Academic research on effective evaluation and IT project success is then summarised, gaps identified and a conceptual framework developed.

2.2 Definitions of IT Project Evaluation

2.2.1 Evaluation Defined

There are many different definitions of information systems (IS)/IT evaluation in the literature (Irani & Love 2008). In general terms, evaluation is 'the process of providing information designed to assist decision making about the object being evaluated' (Owen 1993, p.3). There are different levels at which evaluation may be performed, including the national, sector, organisation and application level (Smithson & Hirschheim 1998). Different concepts, frames of reference and criteria apply at each level. The focus of this research is on the evaluation of individual IS investments, referred to throughout this thesis as IT projects. Reflecting common industry usage and unless otherwise stated, IT is taken to also mean IS.

In terms of IT projects, evaluation may be defined as the process of establishing by *quantitative* or *qualitative* means the worth of IT projects to the organisation (Willcocks 1992; Remenyi et al. 1997). Farbey et al. (1999a, p.190) define evaluation as 'a process, or group of parallel processes, which take place at different points in time or continuously, for searching and for making explicit, quantitatively or qualitatively, all the impacts of an IT project and the programme and strategy of which it is a part'. Thus, IT project evaluation is a technique or a set of techniques that facilitates decision making across the project lifecycle with the goal of achieving the best outcomes for the organisation (Smithson & Hirschheim 1998; Remenyi & Sherwood-Smith 1999; Irani et al. 2005).

2.2.2 Stages of Evaluation

The process of evaluation covers the entire systems lifecycle (Farbey et al. 1993; Irani et al. 2005). Since IT evaluations may be conducted either prior to investment, during project delivery, or after the project is complete, IT evaluation includes both *predictive evaluations* (*ex-ante*) and *prescriptive evaluations* (*ex-post*) (Remenyi & Sherwood-Smith 1999).

In the early stages, evaluation may involve a feasibility study of a proposed investment, or the comparison and prioritisation of alternatives. During the implementation process, the focus is on project control. A post-implementation review may be conducted to determine the final costs of the project, whether the objectives of the project were achieved and what lessons can be learned. The performance of the system may also be monitored on an ongoing basis to realise benefits and drive continuous improvements (Farbey et al. 1993). While the traditional evaluation cycle focuses on feasibility, an update after design and a post-implementation review, it is argued that evaluation should be applied frequently and continuously as an integral part of the systems development life cycle (Smithson & Hirschheim 1998; Remenyi & Sherwood-Smith 1999).

2.2.3 Purpose of Evaluation

According to Patton (1990), the purpose of evaluation is to inform action, enhance decision making and apply knowledge to solve problems. Evaluation is a key part of effective IT governance, particularly with respect to how limited resources will be allocated to competing IT projects to derive the best value for the organisation (McKay & Marshall 2004). IT governance may be thought of in terms of the principles, structures, processes and decision rights for aligning IT investments to business imperatives, evaluating IT projects, managing IT-related risks, and supporting the realisation of benefits (Peters 1996; McKay & Marshall 2004; Weill & Ross 2004). Thus, evaluation should form the basis for action to improve the selection, implementation and use of IT systems (Hedman & Borall 2004).

> *Viewed in systems terms, evaluation provides the basic feedback function to managers as well as forming a fundamental component of the organisational learning process. In terms of its functions, evaluation is seen as essential for problem diagnosis, planning and the reduction of uncertainty (Smithson & Hirschheim 1998, p.160).*

Predictive evaluations are used to predict the feasibility, cost, and impact of proposed IT investments. Typically, predictive evaluations are used to inform IT investment decisions, compare the merit of different projects, provide a set of measures to inform improvement efforts, and to obtain commitment for the project (Farbey et al. 1992; Remenyi & Sherwood-Smith 1999; Irani & Love 2002). By contrast, *prescriptive evaluations* are typically conducted to assess the performance of the project, the impact of the system, and to learn lessons for

further process improvement (Remenyi & Sherwood-Smith 1999). For example, post-implementation reviews are prescriptive evaluations conducted after the project has been finalised. The purpose of post-implementation reviews is to provide a comparison of planned with actual achievements, to learn how well resources have been used, and to improve the selection and management of future IT investments (Farbey et al. 1992). Also, the process of benefits realisation involves *both* predicting and planning for benefits from IT projects, and then actively tracking and managing them for improvement (Lubbe & Remenyi 1999). While benefits realisation spans the lifecycle of a project, it is most prominent after project implementation (Farbey et al. 1999b).

2.3 Literature Overview

Research on IT project evaluation has some recurring topics and themes. These are summarised in Table 2.1. The literature is organised into five topics: (1) Evaluation Practices, (2) Evaluation Content, (3) Evaluation Process, (4) Evaluation Context, and (5) Evaluation Outcomes. Within each topic, key themes and examples are identified from the literature.

Table 2.1: Classification of the IT project evaluation literature

Literature Topics	Examples
(1) Evaluation Practices	
Use of Evaluation	Farbey et al. (1992), Willcocks and Lester (1996), Ward et al. (1996), Ballantine et al. (1996b), Ballantine and Stray (1998), Seddon et al. (2002), Lin and Pervan (2003), Lin et al. (2005)
Challenges/Problems	Willcocks (1992), Farbey et al. (1993), Ballantine et al. (1996b), Fitzgerald (1998), Smithson and Hirschheim (1998), Remenyi and Sherwood-Smith (1999), Counihan et al. (2002), Irani (2002)
Barriers	Powell (1992), Willcocks (1992), Ballantine et al. (1996b), Willcocks and Lester (1997), Irani (2002), Seddon et al. (2002), Murphy and Simon (2002)
(2) Evaluation Content	
Benefits	Giaglis et al. (1999), Irani (2002), Murphy and Simon (2002), Shang and Seddon (2002), Love et al. (2005)
Costs	Irani et al. (1998), Remenyi et al. (2000), Love et al. (2004), Irani et al. (2006), Love et al. (2006)
Risks	Willcocks and Margetts (1994), Baccarini et al. (2004), Love et al. (2005)
(3) Evaluation Process	
Investment Appraisal	Ward (1990), Renkema and Berghout (1997), Fitzgerald (1998), Ballantine and Stray (1998; 1999), Anandarajan and Wen (1999), Irani and Love (2001b), Irani and Love (2002), Gunasekaran et al. (2006)
Post-Implementation Review	Kumar (1990), Norris (1996), Seddon et al. (2002), Gwillim et al. (2005), Sharif et al. (2005), Al-Yaseen (2006)
Benefits Realisation	Farbey et al. (1999b), Remenyi and Sherwood-Smith (2001), Alshawi et al. (2003), Lin and Pervan (2003), Bennington and Baccarini (2004), Lin et al. (2005)
Continuous Evaluation/Learning	Remenyi and Sherwood-Smith (1999), Serafeimidis and Smithson (1999), Irani et al. (2001), Huang et al. (2003), Beynon-Davies et al. (2004)
(4) Evaluation Context	
Purpose of Evaluation	Farbey et al. (1992), Willcocks (1992), Smithson and Hirschheim (1998), Farbey et al. (1999a), Remenyi and Sherwood-Smith (1999), Ballantine et al. (2000), Irani and Love (2002)
Politics and Ethics	Smithson and Hirschheim (1998), Ballantine et al. (2000), Gwillim et al. (2005), Klecun and Cornford (2005), Wilson and Howcroft (2005), Stockdale and Standing (2006)
Stakeholders	Renkema (1998), Serafeimidis & Smithson (1999; 2003), McAulay et al. (2002), Milis and Mercken (2004), Wilson and Howcroft (2005)
(5) Evaluation Outcomes	
IT Business Value	Cronk and Fitzgerald (1999), Bannister and Remenyi (2000), Kleist (2003), Melville et al. (2004), Sugumaran and Arogyaswamy (2004), Gregor et al. (2006)
IT Success/Failure	DeLone and McLean (1992), Ballantine et al. (1996a), Saarinen (1996), Seddon et al. (1999), Wixom and Watson (2001), Rai et al. (2002), Wilson and Howcroft (2002), DeLone and McLean (2004)

The classification of literature on IT evaluation provides a framework for the remainder of the literature review. Each of the evaluation topics and themes is now discussed.

2.4 IT Evaluation Practices

2.4.1 The Nature of IT Investments

IT projects are often perceived to take too long to implement, cost too much and not deliver the business benefits initially intended (Love et al. 2004). IT projects are renowned for their high failure rate, with estimates that as many as 60–70 per cent of projects deliver no business benefits (Renkema 1998; Smithson & Hirschheim 1998). Although IT project failure is considered widespread (Lubbe & Remenyi 1999; Love et al. 2005), there is no commonly agreed definition of success and failure (Irani et al. 2001; Wilson & Howcroft 2002). Due to the nature of IT investments, success is not a 'black and white' concept (Wateridge 1998).

Investments in IT are characterised by complex interfaces, multiple stakeholders, high risk, significant intangible costs and intangible benefits (Irani et al. 2001; Seddon et al. 2002; Milis & Mercken 2004). Studies have consistently found that organisations find it difficult to evaluate IT projects (Hochstrasser & Griffiths 1991a; Willcocks 1992; Ballantine et al. 1996b; Willcocks 1996b; Fitzgerald 1998). Long-standing difficulties with evaluation practice are also exacerbated by a rapidly changing business environment, shorter technology lifecycles and a high degree of uncertainty regarding IT project outcomes (Patel & Irani 1999; Murphy & Simon 2002; Melville et al. 2004). It is argued that IT projects are sufficiently different from other capital investments to require a different approach to evaluation (Irani & Love 2008).

In response to the high failure rate of IT projects, a range of evaluation techniques have been developed to improve evaluation (Farbey et al. 1993; Irani & Love 2001a). However, in practice, IT projects are often evaluated using the same techniques used for other capital investments (Ballantine & Stray 1999; Irani & Love 2008). Despite the extensive literature on IT evaluation (Irani & Love 2001a, 2002), organisations appear to be no nearer a solution to meaningful evaluation than they were over a decade ago (Farbey et al. 1992; Ballantine & Stray 1998; Irani & Love 2008). Problems with IT project evaluation persist and IT projects continue to experience high failure rates (Lubbe & Remenyi 1999; Love et al. 2005).

2.4.2 Current Evaluation Practices and Problems

The problems with IT evaluation have been widely reported in the literature (Willcocks 1992; Ballantine et al. 1996b; Counihan et al. 2002; Lin et al. 2005; Irani & Love 2008). Many of

the problems with evaluation identified over the past two decades are still prevalent today (Gunasekaran et al. 2008). These include lack of rigour in evaluation (Willcocks & Lester 1997; Fitzgerald 1998; Seddon et al. 2002); focus on *ex-ante* rather than *ex-post* evaluation (Remenyi & Sherwood-Smith 1999; Lin & Pervan 2003); predominant use of cost-benefit analysis (Willcocks 1994, 1996a; Ballantine & Stray 1998); focus on financial techniques not intangibles (Farbey et al. 1993; Smithson & Hirschheim 1998; Irani 2002); and a fragmented approach to learning from previous IT investments (Willcocks 1992; Beynon-Davies et al. 2004).

While organisations normally carry out some form of evaluation as part of project approval (Smithson & Hirschheim 1998; Irani & Love 2001a), it seems that post-implementation evaluations and benefits realisation are rarely carried out (Sohal & Ng 1998; Seddon et al. 2002; Lin et al. 2005). For example, Remenyi and Sherwood-Smith (1999, p.15) state that 'ongoing evaluation of information systems projects, once the projects are initiated, is generally not carried out with sufficient frequency or attention to detail'. Similarly, Lin and Pervan (2003, p.14) state that 'much attention is paid to ways of justifying investments, with little effort being extended to ensuring that the benefits expected are realised'. Thus, empirical evidence of post-implementation evaluations seems to contrast with the perceived value of the practice as espoused in the literature, in terms of improved organisational learning and greater understanding of the required and existing IT infrastructure (Irani 2002).

Table 2.2 summarises the results of studies into the use of formal evaluation before, during and after a project. The table shows that evaluation at the feasibility stage of a project (*ex-ante*) is much more prevalent than post-implementation evaluation (*ex-post*). According to the most recent research, most organisations conduct evaluation at the feasibility stage of a project. However, only about 30–50 per cent of organisations use formal post-implementation evaluation. Further, the actual use of evaluation is expected to be lower than reported; several studies have found that closer examination indicates a tendency for managers to over-report the use of formal evaluation processes (Gwillim et al. 2005; Lin et al. 2005).

Table 2.2: Percentage of companies evaluating before, during and after a project

Literature	Before Project (Feasibility)	During Project	After Project (Post-Implementation)
Norris (1996) (late 1980s data)	n/a	n/a	30%
Farbey et al. (1992)	56%	n/a	n/a
Willcocks and Lester (1996)	96%	n/a	80%
Ward et al. (1996)	60%	n/a	23%
Ballantine et al. (1996b), Ballantine and Stray (1998)	87% (most recent) 62% (all projects)	n/a	n/a
Ballantine and Stray (1999)	83% (most recent) 59% (all projects)	n/a	n/a
Seddon et al. (2002)	68%	69%	50%
Lin and Pervan (2003), Lin et al. (2005)	66%	n/a	33%
Al-Yaseen (2006)	100%	n/a	36%

Post-implementation evaluations are often perceived by decision-makers as unnecessary, distracting, bureaucratic, not worth the effort or just a formality (Willcocks & Lester 1996; Al-Yaseen et al. 2006). Organisations may also view investments post-implementation as a 'sunk cost' (Seddon et al. 2002). In comparison, evaluations prior to project investment are considered more influential in realising benefits from an IT investment (Remenyi & Sherwood-Smith 1999). However, it may also be rational not to evaluate all investments all the time (Seddon et al. 2002). At the feasibility stage, some projects are completed for strategic or compliance reasons, and evaluation processes are often scaled to the size, value and risk of the project involved (Ballantine et al. 1996b).

In addition to the issues surrounding the use of formal evaluation processes, research suggests that IT project evaluation lacks rigour (Willcocks & Lester 1997; Fitzgerald 1998; Seddon et al. 2002). Evaluation is often superficial and only focused on gaining funding approval (*ex-ante*) or for project closure (*ex-post*) (Smithson & Hirschheim 1998; Willcocks & Lester 1999; Jones & Hughes 2001; Alshawi et al. 2003; Al-Yaseen et al. 2006). Organisations often fail to identify all the relevant benefits, costs and risks of IT investments (Anandarajan & Wen 1999). IT implementation is a major challenge and formal criteria to evaluate the effectiveness of IT projects are difficult to establish and then measure. As the role of IT has evolved from one of support to one of strategic importance, the process of evaluation has become increasingly complex (Ballantine et al. 1996b; Martinsons et al. 1999).

The technique most commonly used to evaluate the feasibility of IT investments is traditional cost-benefit analysis (Farbey et al. 1992; Willcocks 1992; Ballantine & Stray 1998; Smithson

& Hirschheim 1998; Lin et al. 2005). This analysis usually incorporates investment techniques such as return on investment, internal rate of return, net present value and payback (Ballantine & Stray 1999). However, traditional financial evaluation methods can be problematic in measuring IT investments and quantifying relevant benefits and costs (Lin et al. 2005). Financial approaches are premised on the idea that over time all investments should yield a positive return (McKay & Marshall 2004). The strength of these methods is that they allow comparison of different investments; the weakness is that good investments may not be approved because they are difficult to assess in financial terms (Farbey et al. 1992; Lubbe & Remenyi 1999; Irani & Love 2000).

IT enhances value in ways not captured by traditional accounting methods and value is found increasingly in intangibles (Kalakota & Robinson 1999; Kleist 2003). It is not possible to quantify all the benefits of IT systems and it is argued that attempts to do so serve no useful purpose (Ward 1990; Saarinen 1996). Financial techniques are unable to accommodate intangible benefits and indirect project costs, and are inadequate for strategic decision making (Lefley & Sarkis 1997; Irani et al. 2005). However, despite the increasing complexity of IT investments, evaluation practices remain focused on cost reduction rather than strategic impact (Sohal & Ng 1998; Suwardy et al. 2003; Bennington & Baccarini 2004; Lin et al. 2005). Research shows that very little attention is given to intangible benefits when investment decisions are made (Farbey et al. 1993; Smithson & Hirschheim 1998; Anandarajan & Wen 1999). There are a range of strategic benefits that are omitted from IT investment appraisals on the grounds that they cannot be financially quantified and/or cannot produce obvious short-term paybacks (Willcocks 1992; Irani 2002). Further, when intangible benefits are included in project appraisal processes they are generally not reviewed at a later stage (Sohal & Ng 1998; Lin & Pervan 2003).

IT project cost identification, measurement and control is another significant problem (Irani 2002; Irani et al. 2006). Direct IT costs, such as hardware, software, installation, training and maintenance, are often underestimated (Irani et al. 1998; Irani & Love 2008). There is a general tendency to underestimate IT costs, in part due to the need to gain acceptance for projects and in part because these costs are not fully understood (Alshawi et al. 2000; Remenyi et al. 2000). Even less attention is given to the indirect costs surrounding IT; but these costs are estimated to be four times greater than the direct IT cost component (Hochstrasser 1992). Indirect costs relate to the costs of integrating new systems into current work practices, including management time and internal system support (Remenyi et al. 2000;

Irani & Love 2001a; Love et al. 2004). Often the significance of these costs only becomes apparent once an IT system is implemented (Li et al. 2000).

IT investments are inherently difficult to assess in advance as there is normally a strong element of risk and uncertainty regarding the final outcome (Changchit et al. 1998). IT projects are often innovative and involve non-proven technology (Nijland & Willcocks 2008). In addition, costs tend to occur immediately whereas benefits arise in the future; the longer the delay in benefits the greater the risk (Irani & Love 2008). Thus, risks generally relate to the anticipated benefits, estimated costs and technical feasibility of the IT system (Willcocks & Margetts 1994; Schwalbe 2004). However, research suggests that insufficient attention is paid to addressing the identification and management of risks in IT projects, contributing to the high rate of IT project failure (Willcocks & Griffiths 1997; Ballantine & Stray 1998; Fitzgerald 1998; Baccarini et al. 2004; Love et al. 2005).

Comparison of *ex-ante* and *ex-post* evaluations provides an important learning opportunity for selecting and managing future IT investments (Farbey et al. 1992). However, the limited research on this topic suggests that organisations do not actively learn from IT successes and failures (Beynon-Davies et al. 2004; Irani & Love 2008). Organisations tend to perform post-implementation reviews as a formality with most thinking of the process only in terms of project 'sign-off' or closure (Remenyi & Sherwood-Smith 1999). For example, in a survey of 123 FTSE500 companies the two least important reasons cited for conducting post-implementation reviews were to record lessons and to improve the evaluation process (Al-Yaseen et al. 2006). However, success may not be possible without learning from failure (Irani et al. 2001; Huang et al. 2003).

The well-documented problems with IT project evaluation persist. As a result many organisations remain unsatisfied with their evaluation methods and processes for IT investments (Alter 1999; Irani & Love 2001a). Addressing these evaluation problems has the potential to improve decision making, resource allocation, IT project success and, ultimately, financial results (Farbey et al. 1993; Lubbe & Remenyi 1999; Alshawi et al. 2003). For this reason, a large part of IT evaluation research has focused on understanding the barriers to effective evaluation.

2.4.3 Barriers to Effective Evaluation

One reason that formal evaluation methods are not widely or consistently adopted by organisations may be the host of practical difficulties with IT evaluation. Studies have consistently found that the identification and quantification of relevant costs and benefits is a major problem for IT project evaluation (Willcocks 1992; Ballantine et al. 1996b; Seddon et al. 2002; Alshawi et al. 2003). This problem arises because cost and benefits change and evolve over time (Remenyi et al. 2000); some IT benefits tend to be intangible (Seddon et al. 2002); and IT projects are often complex (Melville et al. 2004).

These difficulties in measuring benefits and costs are often the cause of uncertainty about the expected impact of IT, and result in a low perceived value of evaluation and poor evaluation practices (Irani & Love 2001a; Serafeimidis & Smithson 2003). Consequently, organisations may decide not to use formal evaluation methods, either *ex-ante* or *ex-post*, since they are considered too difficult or costly to implement (Lin et al. 2005), often involving many political agendas (Smithson & Hirschheim 1998; Irani & Love 2001a). In other cases, managers simply do not understand the importance of the investment evaluation process or the concepts involved (Willcocks & Lester 1997; Remenyi et al. 2000). Ballantine et al. (1996b) also identify organisational problems that hinder the evaluation process—such as lack of time, limited management support, and no defined responsibilities.

The most common barriers to effective evaluation are summarised in Table 2.3. They are organised into seven categories: (1) identification and measurement of costs and benefits, (2) defining and measuring success, (3) understanding value and strategic fit, (4) applying appropriate resources to evaluation, (5) politics associated with decision making, (6) organisational constraints, and (7) understanding of evaluation processes.

Table 2.3: Barriers to effective evaluation

Barrier/Challenge	Explanation	References
(1) Identification and measurement of costs and benefits	Costs and benefits evolve over time; intangible benefits; complexity	Willcocks (1992), Ballantine et al. (1996b), Irani (2002), Seddon et al. (2002), Murphy and Simon (2002), Alshawi et al. (2003)
(2) Defining and measuring success	Availability of data; maturity of measurement systems; no generally accepted measures of success	Saarinen (1996), Neely et al. (2002), Seddon et al. (2002), Lin et al. (2005)
(3) Understanding value and strategic fit	Ambiguity of organisational goals; unclear system requirements; poorly defined IT deliverables	Powell (1992), Irani (2002), Seddon et al. (2002), Melville et al. (2004)
(4) Applying appropriate resources to evaluation	Viewed as difficult and high cost	Norris (1996), Bennington and Baccarini (2004), Lin et al. (2005)
(5) Politics associated with decision making	Different perceptions of stakeholder groups	Willcocks (1992), Smithson and Hirschheim (1998), Irani and Love (2001a), Gwillim et al. (2005)
(6) Organisational constraints	Lack of time; management support; organisational structure	Kumar (1990), Powell (1992), Ballantine et al. (1996b), Ballantine and Stray (1998; 1999)
(7) Understanding of evaluation processes	Limited knowledge or training	Willcocks and Lester (1997), Remenyi et al. (2000)

Powell (1992) argues that the lack of formal IT evaluation is most likely caused by ambiguity concerning organisational goals or system requirements, the belief that IT is *strategic* and thus not amenable to formal evaluation, a climate of cynicism about IT projects, and difficulties in obtaining senior management support. A key problem is the often conflicting perceptions of different stakeholder groups and evaluation may become a highly political activity, redistributing costs and benefits (Smithson & Hirschheim 1998). This may result in both the understatement of costs and the overstatement of benefits in order to gain acceptance for a project (Willcocks 1992; Ward et al. 1996; Bennington & Baccarini 2004).

Overcoming the barriers to effective evaluation has led to research into the nature of IT costs and benefits, the politics of decision making, and the definition of IT business value and success. A range of new evaluation criteria and methods have been proposed. These topics are discussed next.

2.5 Evaluation Content, Process and Context

A useful way to better understand the elements of IT project evaluation is in terms of its content, process and context (Symons 1991). Content is concerned with *what* is to be measured and evaluated, and involves the selection of relevant criteria and values. Process involves the *how* of evaluation and covers the way it is carried out, when, how often and how the results are to be made available. Context involves the consideration of the questions of *why* the evaluation is to be carried out and *who* is involved. There are likely to be different people involved in evaluation at different points of the systems life cycle. According to Smithson and Hirschheim (1998, p.161), 'the subjective judgments of the people concerned in answering the questions of 'what', 'how' and 'when' to evaluate tend to determine the final result of any evaluation study'.

Figure 2.2 provides a visual representation of the content, process and context model. The model provides a more holistic view of evaluation and allows evaluation to be explored in multiple dimensions (Stockdale & Standing 2006). Evaluation is influenced by both the context of the internal and external environments of the organisation (Serafeimidis & Smithson 1999). The internal environment includes factors such as corporate structure, strategy and culture (Willcocks 1992; Willcocks & Lester 1996; Irani & Love 2001a). The external environment includes factors such as the economic situation, legislation and markets (Symons 1991; Smithson & Hirschheim 1998; Remenyi & Sherwood-Smith 1999). These external influences are largely outside of the control of individual organisations but can have a strong influence on IT strategies, and by implication evaluation practices (Gregor et al. 2006).

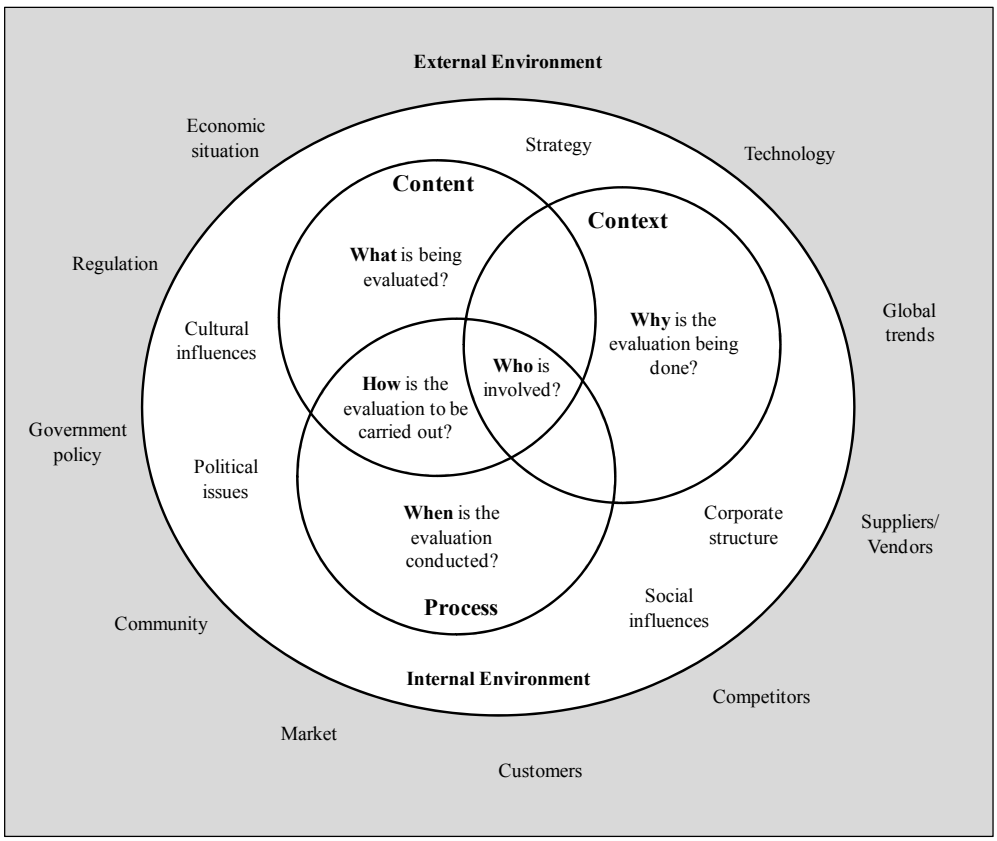

Figure 2.2: Content, process and context model, modified from Stockdale and Standing (2006)

According to Irani and Love (2008, p.xx), 'a lack of understanding as to *why*, *how* and *when* to evaluate IS appears to be the central issue facing managers with little consensus among the academic community'. In order to better understand these issues and identify gaps, the following sections explore the literature on IT evaluation in terms of its content, process and context.

2.5.1 Evaluation Content

A critical element of any evaluation is an understanding of *what* is being measured. Evaluation is based on measurement against an established set of criteria (Smithson & Hirschheim 1998). Researchers advocate a shift from pure financial measures to consideration of intangible benefits, risks and an analysis of opportunities presented by IT (Serafeimidis & Smithson 2000; Love et al. 2006). According to Saarinen (1996, p.104), 'economic evaluation and quantitative measures tend to be difficult to obtain and easy to manipulate. They seldom suffice in practice, but should be supplemented with subjective judgment and multiple diversified criteria'. There have been several themes in the research on IT evaluation content: the addition of more criteria such as risk (Parker et al. 1988), the measurement of intangibles

(Farbey et al. 1993) and the application of different criteria in different contexts (Gunasekaran et al. 2001).

Benefits, costs and risks form the cornerstone of any evaluation process (Ward 1990; Irani et al. 2006; Irani & Love 2008). It has been argued that in order to put resources to best use, IT investments must be evaluated on a consistent basis and priorities set using the same set of criteria (Ward 1990). However, there is very little uniformity in how benefits, costs and risks are evaluated at the project level of an organisation (Stewart & Mohamed 2002). There are often important unplanned consequences from introducing a new system and it can be problematic to decide what to measure, especially as many of the benefits are intangible (Smithson & Hirschheim 1998; Giaglis et al. 1999; Klecun & Cornford 2005). Some of the unintended impacts on performance may also be negative; however, these impacts are rarely identified (Bannister 2008). A further complication is that what is important to measure may vary according to the value judgements of different stakeholder groups and the level of the system to be evaluated (Seddon et al. 1999; Milis & Mercken 2004).

Business benefits are generally considered multi-dimensional (Saarinen 1996; Ross & Vitale 2000; Gregor et al. 2006). The difficulty with identifying the benefits of IT projects has led to a number of frameworks to help identify and classify both tangible and intangible benefits (Irani 2002; Shang & Seddon 2002). For example, DeLone and McLean (2004) propose six major dimensions of IS success: system quality, information quality, service quality, use, user satisfaction and net benefits. Net benefits refer to both the positive and negative impacts of IT, since no outcome is wholly positive (DeLone & McLean 2004). Various levels of IT impact are suggested, including internal, competitive and business portfolio strategy (Bakos & Treacy 1986); efficiency, functionality, threat, pre-emptiveness and synergy (Sethi & King 1994); enhanced productivity, business expansion and risk minimisation (Peters 1994); operational, tactical and strategic (Farbey et al. 1995; Irani & Love 2000); operational, managerial, strategic, IT infrastructure and organisational (Shang & Seddon 2002); informational, transactional, strategic and transformational (Gregor et al. 2006); and individual impact, organisational impact, system quality and information quality (Gable et al. 2008). However, a widely-adopted and extensively validated model of IT benefits remains elusive.

The difficulties with identifying what to measure are exacerbated by a rapidly changing business environment, a high degree of uncertainty regarding IT project outcomes and lagged

effects from the initial investment to the realisation of benefits from IT (Patel & Irani 1999; Shang & Seddon 2002). It is often problematic to isolate the outcomes of a single project due to the large number of programs being implemented at one time (Klecun & Cornford 2005). Given the complexity of attributing benefits to individual projects, where assumptions change over time, it has been argued that evaluation should occur at a program or portfolio level in terms of accumulated costs and benefits from related initiatives, judged against overall investment targets (Lubbe & Remenyi 1999; Lin et al. 2005). However, the variables to use to evaluate IT projects are still not well defined or consistent. This is not surprising given that few organisations claim to have adequate organisational performance measures in place (Neely et al. 2002) and the measurement of intangibles remains an elusive goal (Grasenick & Low 2004).

Most organisations fail to identify the total costs associated with investing in IT (Remenyi et al. 2000; Gunasekaran et al. 2006). Many of these costs are outside the IT function and managers do not have the experience to identify them (Irani & Love 2001a). The difficulties with identifying, quantifying, managing and controlling IT project costs has resulted in a range of cost classifications (Love et al. 2004; Irani et al. 2006). These cost classifications include: initial and ongoing costs (King & Schrems 1978), financial and intangible (Irani 2002), development and hidden (Anandarajan & Wen 1999), social subsystem costs (Ryan & Harrison 2000), direct and indirect costs (Irani & Love 2001b), and control and operations costs (David et al. 2002).

The assessment of risk is also an important but neglected part of the evaluation process (Fitzgerald 1998; Love et al. 2005). In response to calls for more comprehensive risk assessment frameworks, various classifications of risks have been suggested (Willcocks & Margetts 1994). For example, Renkema (1998) classifies important risk factors as external, realisation, organisational and technological risks. Milis and Mercken (2004) list a range of risk types including assessment risk (the risk of not adequately completing a risk assessment), technical risk (the feasibility given current technology), project risk (relating to size and complexity), functional risk (specifications are met but benefits not realised), internal political risk (development or implementation is undermined by vested interests), external environment risk (unanticipated responses from competitors, customers or regulators), and systemic risk (the investment radically alters the market). With a view to improving risk management practice, Baccarini et al. (2004) conducted structured interviews of IT professionals and

identified personnel shortfalls, and unrealistic schedule and budget as the two highest ranked risks in both the literature and their research.

Several classifications of benefits, costs and risks are presented in the literature. However, the identification and management of benefits, costs and risks in IT projects remains problematic in practice. Many of the costs, benefits and risks identified cannot be accommodated within existing financial based evaluation techniques (Irani et al. 2006). This has prompted research into the process of evaluation and led to the development of new integrated evaluation methods that are more sympathetic to their consideration.

2.5.2 Evaluation Process

There have been numerous studies on *how* IT evaluation is carried out, resulting in a myriad of tools and techniques for predictive evaluations (Irani & Love 2001a). There are various classifications of these investment techniques in the literature (Farbey et al. 1993; Remenyi et al. 1995; Irani et al. 1997; Renkema & Berghout 1997; Irani & Love 2002; Milis & Mercken 2004). In general, there has been a shift from traditional financial techniques such as return on investment (Brealey & Myers 1988) towards more integrated techniques such as information economics (Parker et al. 1988), multi-attribute utility theory (Stewart & Mohamed 2002), portfolio approaches (Ward & Peppard 2002), and IT balanced scorecard (Martinsons et al. 1999; Teubner 2007).

The desire to quantify results has led to several extensions to traditional financial approaches using economic theory and ratio-based approaches (Milis & Mercken 2004). These methods include sensitivity analysis of financial estimates (Willcocks 1992) and the use of options pricing to accommodate the uncertain gains from IT investments (Amram & Kulatilaka 1999). However, option theory has been criticised for having too many drawbacks to be used in decision making practice (Renkema 1998). Several ratio-based approaches have also been suggested such as return on management (Strassmann 1990) and return on knowledge (Housel & Bell 2001). However, attempts to reduce analysis to a single figure do not take into account the complexity of IT investment decision making (Ward 1990; Saarinen 1996).

Other approaches to evaluation focus on value and strategic fit. These approaches seek to align IT projects to corporate goals and employ concepts like the value chain (Porter 1985), value analysis (Money et al. 1988), critical success factors (Hochstrasser & Griffiths 1991b)

and investment mapping (Peters 1994). While these methods are useful for selecting investments of a different kind, they do not enable a choice between two mutually exclusive projects, both serving the same purpose (Milis & Mercken 2004). Portfolio approaches attempt to compare projects on specific dimensions and provide a means for setting priorities between projects. Various prioritisation matrices have been produced in the literature (Renkema & Berghout 1997; Ward & Peppard 2002). For example, matrices that classify opportunities according to importance and improvement to quality (Bedell 1985), competitive advantage and disadvantage (Ward & Griffiths 1996), business criticality and practice innovation (Hartman & Sifonis 2000), and viability and project fit (Tjan 2001).

Information economics goes some way to helping with IT evaluation since it seeks to account for a wider scope of benefits, including intangibles, and also incorporates risk (Martinsons et al. 1999). The technique prescribes that benefits and risks are separated into a business domain and a technological domain; and that each is evaluated separately using scores and weightings (Parker et al. 1988). The value derived from IT is a composite of benefits from financial measures, benefits associated with the impact of the IT on the business domain, and improvements made within the technology domain (McKay & Marshall 2004). However, information economics has been criticised as being over-mechanistic, time consuming, subjective and lacking independent verification (Willcocks 1992; Renkema & Berghout 1997).

One of the most influential frameworks for strategic management in the past decade is the balanced scorecard (Kaplan & Norton 1992; Kaplan & Norton 1993). The balanced scorecard matches projects to company performance measures to determine if these measures would improve significantly if the project was successfully completed (Kaplan & Norton 2001). Balanced scorecards have been developed specifically for IS, covering perspectives such as business value, user orientation, internal processes and future readiness (Martinsons et al. 1999). The balanced scorecard has also been modified for e-business (Plant et al. 2003). Balanced scorecard forces management to take a broader view of IT investments (Milis & Mercken 2004).

Methods have also been combined into multi-layer evaluation processes (Milis & Mercken 2004). For example, Fitzgerald (1998) outlines a comprehensive eight-step evaluation process, Lee (2004) integrates strategic and business process decisions into an evaluation methodology, and Stewart and Mohamed (2002) combine multi-criteria utility theory and

information economics into a model for project selection. Table 2.4 summarises some of the major evaluation methods referenced to the literature, adapted from Cronk and Fitzgerald (1999), Irani and Love (2002), and Stewart and Mohamed (2002).

Table 2.4: Classification of evaluation methods

Classification	Evaluation Method	Description	Key References
Financial approaches	Payback period	The period of time required to repay the original investment.	Brealey and Myers (1988)
	Return on investment (ROI)	Based on the current value of estimated future cash flows.	Brealey and Myers (1988), Farbey et al. (1992)
	Cost-revenue analysis	Costs are compared with cost savings or cost displacement.	Horngren and Sundem (1987)
	Cost-benefit analysis (CBA)	All costs and benefits are compared in financial terms.	King and Schrems (1978), Willcocks (1992)
	Net present value (NPV)	Discounts future cash flows to a present value.	Brealey and Myers (1988), Parker et al. (1988)
	Internal rate of return (IRR)	The interest rate at which costs and benefits are equal.	Brealey and Myers (1988), Kakati and Dhar (1991)
Economic approaches	Real options pricing	Applies financial options theory to project investment.	Dos Santos (1991), Benaroch and Kauffman (1999)
	Production theory economics	Applies basic economic models to IT decision making.	Kleist (2003)
Ratio-based approaches	Return on knowledge	The value of knowledge assets is estimated using a single figure.	Housel and Bell (2001)
	Return on management	Management productivity is estimated using a single figure.	Strassman (1990)
Value-based approaches	Strategy and competitive advantage	Assesses the extent to which IT provides competitive advantage.	Bakos and Treacy (1986), Sethi and King (1994)
	Critical success factors	Focuses on the critical factors or activities for ensuring success.	Slevin et al. (1991), Williams and Ramaprasad (1996)
	Value chain analysis	Analyses elements of a value system or supply chain.	Porter (1985)
	Value analysis	Focuses on value added from IT, including intangible benefits.	Money et al. (1988), Keen (1981)
	Process evaluation	Compares new IT-enabled processes with current processes.	Davenport (1992), Lee (2004)
	User satisfaction	Success is measured by the satisfaction of users.	Bailey and Pearson (1983), Iavari and Ervasti (1994)
	Investment mapping	Maps the alignment of IT projects to business strategy.	Peters (1994)
	Knowledge and intangible assets	Competitive advantages stem from intangible assets.	Agarwal et al. (1992), Powell (1997)

Portfolio approaches	Portfolio management	An approach to managing a portfolio of IT projects.	Ward (1990), Ward and Peppard (2002)
	Analytic hierarchy process (AHP)	A formal structure to weight and score decision making criteria.	Saaty (1990), Jiang and Wicks (1999)
	Prioritisation matrix	Compare dimensions of value using a matrix.	Bedell (1985), Ward and Griffiths (1996)
Complementary approaches	Process modelling and simulation	Uses modelling to simulate the benefits from alternatives.	Giaglis et al. (1999), Lee (2004)
	Narratives	Uses stories to describe events and build meaning.	Llewellyn (1998), Hedman and Borell (2004)
	Prototyping	Involves rapid development of a prototype form of system.	Earl (1978), Alavi (1984)
	Game playing	Uses game playing to understand the impact of an investment.	Farbey et al. (1992)
Integrated approaches	Multi-attribute utility theory	Applies utility theory and weightings to compare options.	Goicoechea at al. (1982)
	Multi-layer processes	Uses a combination of various evaluation techniques.	Fitzgerald (1998), Stewart and Mohamed (2002)
	Information economics	Evaluated benefits and risks using scores and weightings.	Parker et al. (1988), Parker and Benson (1989)
	Balanced scorecard	Links measurement to objectives across multiple perspectives.	Kaplan and Norton (1992), Martinsons et al. (1999)

The majority of research on IT evaluation has focused on the development of one best method for evaluation (Sharif & Irani 1999). However, there may not be one best method suitable for all situations (Farbey et al. 1992; Smithson & Hirschheim 1998). It has been suggested that specific evaluation processes and methods should be matched to different projects (Hochstrasser 1990; Farbey et al. 1993; Farbey et al. 1994; Irani 2002). For example, Farbey et al. (1995) suggest that the type of IT project and the type of objectives are the strongest influences on the choice of evaluation method. The objectives of an evaluation are influenced by the stage of the IT project and it is argued that it is 'futile' to compare methods that are not measuring the same aspect of value (Cronk & Fitzgerald 1999). Further, there are a wide variety of social and technical factors that complicate the evaluation process and, according to some authors, make the search for an integrated generic technique 'impossible' (Irani 2002).

In terms of *when* to evaluate, the driving force for timing is the systems development lifecycle (Symons 1991; Farbey et al. 1993; Serafeimidis & Smithson 1999; Irani et al. 2005). Investment decision making is also strongly influenced by the capital budgeting process (Irani & Love 2002). Thus, various points of evaluation have been suggested including opportunity

identification, priority setting, project approval, project delivery, project closure, post-implementation and ongoing benefits realisation (Farbey et al. 1993, 1999b; Lubbe & Remenyi 1999; Stewart & Mohamed 2002). Viewing evaluation as a continuous interactive process between *ex-ante* and *ex-post* evaluation allows learning to occur and reduces the risk of failure (Remenyi & Sherwood-Smith 1999; Serafeimidis & Smithson 1999). However, there is limited research on the interaction between *ex-ante* and *ex-post* evaluation processes (Beynon-Davies et al. 2004).

Project closure and post-implementation reviews are generally viewed as a once off exercise (Al-Yaseen et al. 2006). However, the likely timeframe for the impact of a system is highly uncertain and is likely to extend further than the traditional lifecycle, suggesting that regular evaluation is required to ensure that benefits are realised (Willcocks 1996b; Serafeimidis & Smithson 1999; Remenyi & Sherwood-Smith 2001; Shang & Seddon 2002). For example, Shang and Seddon (2002) suggest that it may take six to 12 months before benefits from Enterprise Resource Planning (ERP) investments start to be realised and the timeframe will vary according to the nature of the benefits. While a number of evaluation cycles have been proposed (Ward et al. 1996), there is little integration of benefits management with the rest of the systems development lifecycle (Serafeimidis & Smithson 1999). Further, despite the recognition of the importance of post-implementation review and benefits realisation, most of the current research on IT evaluation focuses on *ex-ante* rather than *ex-post* evaluation (Al-Yaseen et al. 2006).

In summary, criticism of traditional evaluation techniques has resulted in a number of alternative methods, including critical success factors, user satisfaction, multi-criteria methods and balanced scorecards (Klecun & Cornford 2005). However, new evaluation methods remain largely unused (Ballantine & Stray 1998). The response to underutilisation of methods has been the development of even more methods and criteria (Bannister & Remenyi 2000; Irani & Love 2002). However, investment decisions depend on more than a method or technique, and IT should not be considered in isolation (Smith & McKeen 2003; Irani et al. 2005). As a result there has been a call for more research to understand why organisations do not use more of these evaluation techniques in practice (Ballantine & Stray 1998; Nijland & Willcocks 2008).

2.5.3 Evaluation Context

IT investment decisions depend on the organisational context in which such decisions are made (Serafeimidis & Smithson 2003; Irani et al. 2005). The organisational context determines the *why* and *who* of an evaluation (Serafeimidis & Smithson 1999; Stockdale & Standing 2006). In particular, political, cultural and organisational aspects play a key role in shaping evaluation practices (Walsham 1993; Willcocks & Lester 1999; Klecun & Cornford 2005). Thus, research in this area has focused on alignment with business strategy and organisational interests, evaluation in different contexts, and political and social aspects of the evaluation process (Symons 1991; Smithson & Hirschheim 1998). The issues of power and politics have also led to ethical questions about the process of IT evaluation (Ballantine et al. 2000).

The purpose of evaluation needs to be considered in any choice of evaluation method and approach (Farbey et al. 1992; Ballantine et al. 2000). Evaluation is generally viewed as a rational process to determine the value, worth or success of an IT investment (Willcocks 1992; Remenyi et al. 1997). However, evaluation can also be used for political or social reasons and become a ritualistic process (Farbey et al. 1999a; Stockdale & Standing 2006). Wilson and Howcroft (2005, p.18) argue that 'formal or legitimate evaluations are not transparent processes, whereby outcomes are measured in an objective way against criteria'. Evaluation methods are not neutral; they help shape reality and do not just represent reality (Farbey et al. 1999a; Nijland & Willcocks 2008). Further, the ascription of success and failure to an IT project is a social accomplishment dependent on the perspective of the subject (Wilson & Howcroft 2002).

Evaluation is affected by the views of the stakeholders involved, and the outcome of evaluation also has an impact on various stakeholders (Serafeimidis & Smithson 1999). IT project evaluation is therefore a political process and decision making is influenced by institutional pressure and individual aspirations (Farbey et al. 1993; Hedman & Borall 2004). In order to reduce the likelihood of political influence it is advocated that the perspectives of a variety of stakeholders be considered when conducting evaluations (Farbey et al. 1993; Renkema 1998; Cronk & Fitzgerald 1999; Irani et al. 2006). This is particularly important since judgements of positive and negative consequences are dependent on the value judgements of involved stakeholders, and reaching a common perspective provides a greater chance of project success (Renkema 1998). However, McAulay et al. (2002) illustrate via a

case study that the construction of shared criteria to support evaluation is problematic and may be undermined by powerful stakeholders. Thus, inequalities of power will determine whose interests are reflected in the purpose and outcomes of the evaluation (Ballantine et al. 2000).

There are many evaluation roles, each with different objectives (Serafeimidis & Smithson 2003). Milis and Mercken (2004) identify five parties involved in IT investment decisions: management, users, project team, suppliers and stakeholders. Stockdale and Standing (2006) classify the literature around initiators, evaluators, users and interested parties. Serafeimidis and Smithson (2003) identify the strategist for evaluation, the evaluator, the champion, the sponsor and other relevant stakeholders, such as senior managers and users. Evaluations are often used for galvanising support of stakeholders, a key determinant of IT project success (Wilson & Howcroft 2005). To build support, Renkema (1998) suggests the involvement of senior management, IT specialists, financial executives and the employees whose work is affected by the IT investment. Evaluation is as much about the people involved as the projects themselves, and the actions and experience of senior managers in decision making is critical (King & McAulay 1997). Therefore, collaboration between stakeholders and senior management support at the highest level are advocated as effective practices for evaluating IT investments (Renkema 1998).

The evaluator has a critical role in any evaluation (Ballantine et al. 2000; Serafeimidis & Smithson 2000). With regard to who has responsibility for evaluation, Fitzgerald (1998) suggests that evaluation should be done by the people who are expected to implement the project, guided by a facilitator, and not the IT department who often have a vested interest in the outcome. Weill and Broadbent (1998) recommend joint responsibility for investment decision making. However, in practice the IT department is often responsible for IT project evaluation (Ballantine et al. 1996b; Lin & Pervan 2003). The evaluation process may be further complicated by relationship issues between IT and the business (Ward & Peppard 1996; Peppard & Ward 1999). A strong relationship between IT and the business, based on mutual respect and trust, is necessary for IT and the business to work together effectively on projects (Chan 2002; Piccoli & Ives 2005).

Evaluation is a key part of effective IT governance (McKay & Marshall 2004). Effective IT governance is associated with clear accountability for the processes and outcomes related to IT (Keyes-Pearce 2002). Thus, it has been suggested that IT projects cannot succeed without

clear evaluation methodologies and accountability (Danks 1997). However, Farbey et al. (1999b, p.249) argue that in a rapidly changing environment, 'there is little point in holding people to account for a situation beyond their control and which may no longer be relevant'. Evaluation should be a collective tool of management and not be treated as a way to hold people accountable (Renkema 1998). Moreover, managers may seek to avoid evaluation and accountability due to the potential for negative results and embarrassment (Gwillim et al. 2005).

The problems with IT project evaluation are related to more than the use of evaluation methods and criteria. Evaluation is also influenced by the characteristics of the organisation, the people involved, the process of evaluation and the external environment (Nijland & Willcocks 2008). Despite this, IS research has focused on developing new methods and techniques for evaluation rather than developing a deeper understanding of the evaluation process (Hirschheim & Smithson 1999). This has often neglected the social and political processes of evaluation that define success and failure (Wilson & Howcroft 2005). Thus, it has been advocated that research expand its focus to better understand the process of evaluation, the stakeholders involved and their perspectives (Serafeimidis & Smithson 2003).

2.6 Effective Evaluation

2.6.1 Outcomes of Evaluation

To improve evaluation practices requires an understanding of the outcomes of evaluation and the value of IT (Bannister & Remenyi 2000). However, there is considerable ambiguity and inconsistency in the literature regarding what constitutes effectiveness, success, impact and IT business value (Cronk & Fitzgerald 1999; Melville et al. 2004). Kleist (2003, p.251) point to inconsistent definitions, 'dependent variable ambiguity, work scattered across disciplines, and variations in type of impact measured' as the causes of an overall lack of consistency in IT evaluation research. There are a broad range of definitions, and IT value is an ambiguous concept that is often not formally defined (Bannister & Remenyi 2000). Given that value is in the 'eye of the beholder', Bannister and Remenyi (2000, p.234) suggest that 'investment decisions are based on perceived value, however measured'.

The reasons why organisations evaluate IT projects vary. These include, but are not limited to (Remenyi & Sherwood-Smith 1999; Irani & Love 2002):

- Deciding whether to invest in a particular IT system or project;
- Comparing and ranking different projects to assist capital rationing;
- Obtaining commitment to a project;
- Controlling costs, benefits and risks during the development and implementation of projects;
- Learning if an investment was successful; and
- Facilitating corporate learning.

Understanding why organisations evaluate projects is important for identifying and defining effective practices. While various definitions of evaluation and its purpose exist, there appears to be no clear agreement about what constitutes *effective evaluation*. At one level, effectiveness may be defined as whether the evaluation achieves its purpose. Thus, effective evaluation practices result in effective IT project evaluation outcomes. For example, improved decision making (Renkema 1998; Remenyi & Sherwood-Smith 1999), greater consistency (Ward 1990; Farbey et al. 1993), greater accuracy (Love et al. 2004), and corporate learning (Farbey et al. 1992; Smithson & Hirschheim 1998).

Although rarely stated as such, the evaluation of IT projects is also inherently associated with the issues of IT project success and failure (Beynon-Davies et al. 2004). Since the purpose of project evaluation is to inform action, enhance decision making and apply knowledge to solve problems (Patton 1990), it seems reasonable to expect a positive correlation between effective evaluation practices and subsequent project success. Therefore, it is argued that improving evaluation practices may also be an important driver for improved IT project outcomes in the future (Remenyi & Sherwood-Smith 1999; Tallon et al. 2000; Lin et al. 2005).

2.6.2 Effective Evaluation Practices

This presumed causal connection has resulted in numerous studies on methods and criteria for IT evaluation, and in a myriad of tools and techniques for predictive evaluations (Irani & Love 2001a). The extant literature supports the view that the use of formal processes, defined procedures, and frequent points of evaluation are generally related to more effective evaluations, i.e., improved decision making (Renkema 1998; Remenyi & Sherwood-Smith 1999), greater consistency (Ward 1990; Farbey et al. 1993), greater accuracy (Love et al. 2004), corporate learning (Farbey et al. 1992; Smithson & Hirschheim 1998), and ultimately the successful realisation of IT project outcomes (Lubbe & Remenyi 1999; Lin et al. 2005).

Formal evaluation is considered beneficial even for mandatory and long-term infrastructure investments (Renkema 1998; Krell & Matook 2009).

Good decision making regarding IT investment is particularly important for those organisations that use IT for strategic purposes. In such organisations, Tallon et al. (2000, p.154) argue that 'there is an even greater need for these investments to undergo routine, systematic and recurring evaluation'. Alshawi et al. (2003) and Love et al. (2004) also conclude that organisations need to undertake more systematic and rigorous evaluation processes before implementing IT if they are to achieve improvements in business performance. There is general consensus that a rigorous evaluation process must take place prior to IT deployment and implementation (Lubbe & Remenyi 1999; Irani & Love 2001a). Despite such evidence and strong academic arguments for more systematic evaluation of IT projects, many companies do not use formal evaluation processes and investment decisions continue to be based on 'acts of faith' (Ballantine et al. 1996b; Willcocks & Lester 1997; Lubbe & Remenyi 1999; Bannister & Remenyi 2000). The lack of regular systematic monitoring of IS projects and the lack of rigour when these evaluations are conducted is seen as a major problem (Remenyi & Sherwood-Smith 1999).

Strategic alignment and evaluation processes are clearly linked in creating value from IT (Earl 1993; Avison et al. 2004). The need to align IT investments to business strategies is generally agreed (Goldsmith 1991; Reich & Benbasat 1996; Teo & King 1997; Segars & Grover 1998). Thus, the realisation of IT project outcomes is considered partly a function of alignment with an organisation's business strategy (Tallon et al. 2000; Willcocks & Graeser 2001). Further, based on an Australian survey of 81 senior executives, Sohal & Ng (1998) found that the potential of IT has not been met due in part to IT strategy not being aligned with business objectives, and inadequate and inappropriate evaluation of proposed IT investments. Thus, consideration of strategic alignment during *ex-ante* IT project evaluation is seen as another effective practice.

Other effective practices have been identified throughout this literature review. In terms of evaluation processes, it has been suggested that specific evaluation processes and methods should be matched to different projects (Farbey et al. 1992; Smithson & Hirschheim 1998; Irani 2002). In terms of evaluation content, it is important that all relevant costs and benefits are identified and measured, including intangibles (Ward 1990; Irani et al. 2006). In terms of evaluation context, collaboration between stakeholders and senior management support at the

highest level are advocated as effective practices (Renkema 1998; Wilson & Howcroft 2005). Finally, evaluation should be viewed as a continuous interactive process to allow learning to occur and reduce the risk of project failure (Remenyi & Sherwood-Smith 1999; Serafeimidis & Smithson 1999).

In short, most of the literature supports the view that more formal IT project evaluation methods are required (Irani & Love 2002). However, there is very little research on what constitutes an appropriate level of formality or rigour, or what specific practices are necessary for evaluation to be effective. According to Ballantine et al. (1996b, p.139), for instance, 'the role of formal procedures in the IS/IT evaluation process needs to be more closely examined to identify whether their use results in any significant benefits'.

2.6.3 Summary of Effective Practices

In summary, the literature suggests that effective IT project evaluation practices should involve:

- Use of formal evaluation processes;
- Matching of evaluation techniques to the context of evaluation;
- Identification and measurement of *relevant* costs and benefits, including intangibles;
- Alignment of evaluation criteria with strategy;
- Involvement of a range of stakeholders; and
- Continuous evaluation across the systems development lifecycle.

Many more practices may exist in the literature. However, there is limited integration of these concepts. There are also no clear guidelines for practitioners about what practices are *most* effective and *how* to improve evaluation practices. This has led to a call for more theory building and further empirical studies on evaluation in practice (Serafeimidis & Smithson 2000).

In order to improve the understanding of *effective* evaluation practices, a deeper understanding of IT project success is also required. The next section describes the elusive concept of IT project success.

2.7 IT Project Success

Over the years, experienced project managers, project organisations and project researchers have attempted to trap the essence of what is behind project success, a difficult and elusive concept, with many different meanings (Freeman & Beale 1992). Further, the ascription of success and failure is a social accomplishment dependent on the perspective of the subject (Wilson & Howcroft 2002; Bartis & Mitev 2008). Thus, success and failure are difficult to define and measure since they mean different things to different people. However, success is also a concept that is critical when trying to foretell the future of projects (Christenson & Walker 2004). Although IT project failure is considered widespread (Lubbe & Remenyi 1999; Love et al. 2005), there is no commonly agreed definition of success and failure (Irani et al. 2001; Wilson & Howcroft 2002).

Myers (1994) suggests that success is achieved when an information system is *perceived* to be successful by stakeholders. This appears sensible; however, perceptions are influenced by expectations that may be unrealistic (Szajna & Scammel 1993; Staples et al. 2002). As the work of Nobel Prize winner Daniel Kahneman and Amos Tversky on *prospect theory* explains, optimistic expectations regarding time, budget or quality can be regarded as normal human psychological behaviour under conditions of uncertainty (Kahneman et al. 1982). Given this human tendency to underestimate challenges and to overestimate their own capabilities, stakeholders could perceive as a partial failure a project that was in fact successful in achieving near-optimal results. It also has to be considered that sponsors of a project may view 'success as the survival of their project' (Wilson & Howcroft 2002, p.238). In which case, project success may be perceived even if the project did not perform in an optimal manner. How success is defined and who evaluates success therefore affects the final judgement of success and failure (Smithson & Hirschheim 1998).

However, projects are necessarily different and 'the nature of each situation cannot be assessed by a simplistic one-dimensional measure of success' (Saarinen 1996, p.105). IS often succeed in one respect but fail in others (Remenyi & Sherwood-Smith 1999). For example, failure can occur even when the technical system has performed as intended (Wilson & Howcroft 2002). Further, a project can still be considered successful if it does not meet timescales and budget (Wateridge 1998). Project success extends beyond technical performance, cost and duration to dimensions such as user satisfaction and benefits.

Thus, it is widely accepted that success is a multi-dimensional construct (Saarinen 1996; Gable et al. 2008). What is not agreed is which dimensions best represent success (Rai et al. 2002; Sugumaran & Arogyaswamy 2004). Cooke-Davies (2002) distinguishes between project management success being measured by time, cost and quality, and project success, that is measured against the overall objectives of the project. Project management success is subordinate to and may also contribute to project success (Baccarini 1999). Successful projects are more likely to emphasise project success criteria rather than project management success criteria; however, project management success is much easier to measure because it is less complex and can be assessed at project closure (Jugdev & Muller 2005).

Success, for IT projects, is not a 'black and white' concept (Wateridge 1998). It can be viewed as a combination of project implementation success and systems success (Espinosa et al. 2006). Systems success can be separated into three levels: technical development, deployment to the user and delivery of business benefits (Ballantine et al. 1996a) or treated as a four-dimensional construct consisting of the success of the development process, success of the use process, quality of the product, and impact on the organisation (Saarinen 1996). DeLone and McLean (1992) propose six major dimensions of systems success, that they refine to include: system quality, information quality, service quality, use, user satisfaction and net benefits (DeLone & McLean 2003, 2004).

However, user satisfaction as a measure of success has been criticised for lacking strong theoretical underpinnings (Gatian 1994; Goodhue 1995). Satisfaction may also be a consequence of success rather than a dimension (Gable et al. 2008). Additionally, while use is considered a necessary condition for success (Saarinen 1996; Petter et al. 2008); frequent or widespread use is not considered necessary for success with some information systems such as data warehousing (Wixom & Watson 2001). Further, it is reasonable for companies with innovative strategies to expect and accept some level of project failure. It should also be noted that even when specific system implementations fail, net benefits and organisational success could be achieved by transforming the initial project failure into organisational learning (Irani et al. 2001).

The difficulties with defining success mean that many projects are initiated without a clear statement of what will be regarded as success (Remenyi & Sherwood-Smith 1999). Conversely, having an inspiring vision of what the project is meant to achieve is in itself a significant driver of project management success (Christenson & Walker 2004). Thus,

negotiating a definition of success among key stakeholders before the start of a project and at several review points during the project's lifecycle has been recommended as a good project management practice (Jugdev & Muller 2005).

According to DeLone and McLean (2004), net benefits address the ultimate impact of a system and therefore represent the most important category of success measurement. However, 'success criteria in terms of benefits delivered are the exception rather than the rule, and in many cases measures of project success are defined after project implementation or not at all' (Lubbe & Remenyi 1999, p.146). Benefits can be difficult to measure, and are often different to those anticipated when the IT project is first proposed (Farbey et al. 1992). This raises issues of whether success should be judged against the original estimate, a revised target or some other performance benchmark.

Further, formal *ex-post* evaluations are often not conducted because of political agendas (Smithson & Hirschheim 1998). The political motivation to avoid evaluation stems from the perception that evaluations are about finding failures and thus result in negative outcomes, such as embarrassment, for managers (rather than being a learning experience). This perception is important because 'as long as managers perceive personally negative consequences irrespective of the outcome of *ex-post* evaluations, a strong disincentive to undertake them exists' (Gwillim et al. 2005, p.315).

While the extant literature has focused on measuring the rate of IT project failure, understanding the causes of failure, and developing tools and techniques to improve project success, there is still no commonly agreed definition of success and failure (Wilson & Howcroft 2002). Finally, and perhaps most importantly, there appears to be no empirical research on the relationship between specific evaluation practices and IT project success.

2.8 Theoretical Framework and Research Issues

2.8.1 Research Problem

The preceding review of the literature has identified a number of themes:

- IT project evaluation is important;
- Current IT project evaluation practices are inadequate;
- There is a wide range of evaluation techniques available; and

- Very few of the currently available techniques are used in practice.

Given the large and increasing number of evaluation methods, it seems unlikely the lack of use of evaluation methods will be solved by creating more tools and techniques. Although there are many methodologies for evaluating IT projects, the literature is lacking in substantive theories of effective IT project evaluation practice grounded in empirical data. To the best knowledge of the researcher there has been no comprehensive and systematic research into what practices are necessary for IT project evaluation to be effective and why they work.

This review has identified that there are a number of important gaps in the literature. First, there is very little research on what constitutes an appropriate level of formality or rigour, or what specific practices are necessary for evaluation to be effective. Second, there is limited research on *ex-post* evaluation and the integration of evaluation practices across the project lifecycle. Finally, few studies agree on how project success is defined, and, more to the point, the relationship between specific evaluation practices and IT project success.

Companies are uncertain as to what value they are getting from IT projects. While the problems with evaluating IT projects are well documented, the solutions proposed in the literature do not appear to be adopted in practice. Therefore, there is a noticeable gap between academic theory and actual evaluation practice in organisations. Organisations appear to be no nearer a solution to meaningful evaluation than they were over a decade ago and IT projects continue to experience high failure rates.

As a result, there is a need for further research to develop theoretical frameworks targeting the improvement of IT project evaluation practice. To meet this challenge, this study takes a holistic and systemic view of IT project evaluation. Its goal is to identify effective practices and understand why they work.

The primary research problem to be investigated can be stated as:

How can organisations improve the evaluation of IT projects?

2.8.2 Research Questions

To achieve this aim, four sub-questions are also posed:

1. How do organisations evaluate IT projects?
2. To what extent do organisations formally evaluate IT projects and why?
3. How do organisations define IT project success?
4. What are the most effective IT project evaluation practices used by organisations and why are they effective?

2.8.3 Conceptual Framework

Based on the literature review, a conceptual framework was developed to explain the key constructs to be studied and the presumed relationships among them. The conceptual framework is shown in Figure 2.3.

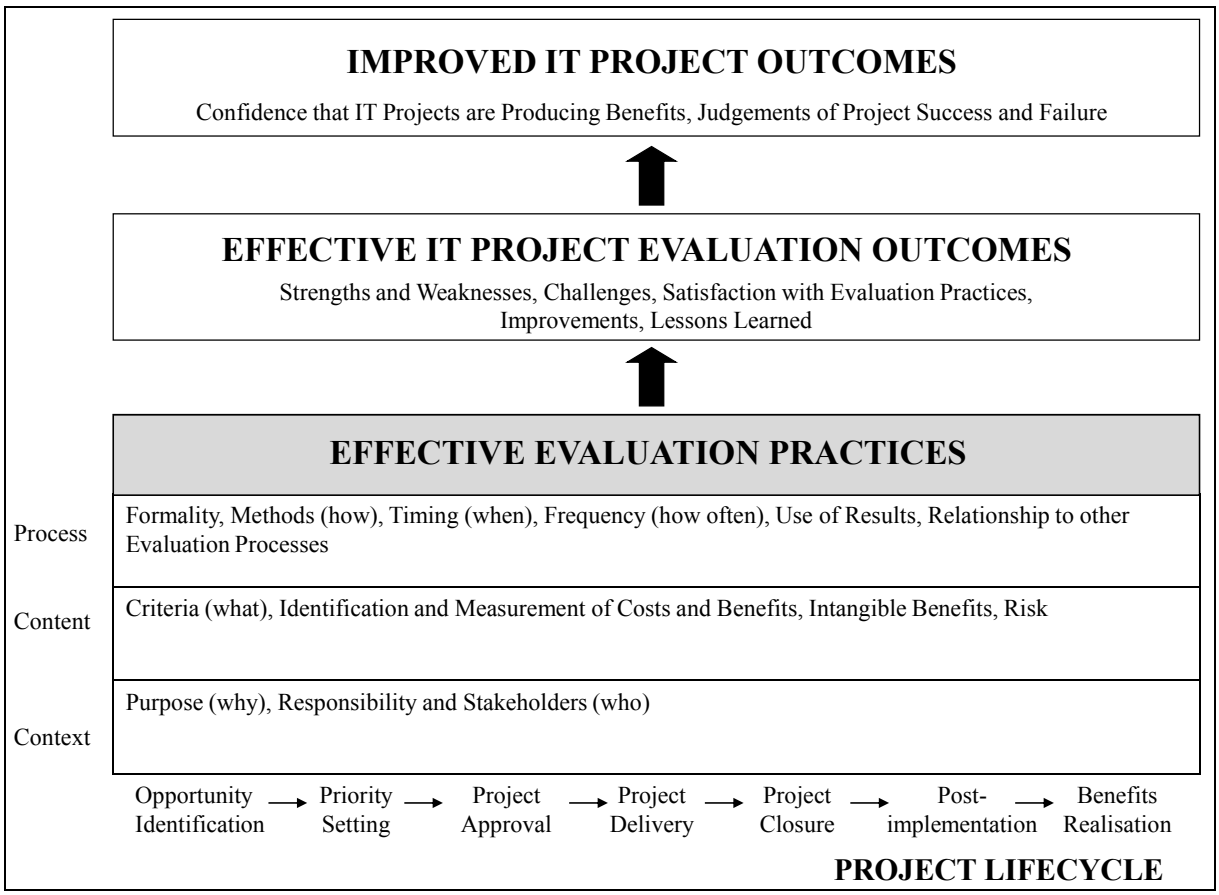

Figure 2.3: Conceptual framework of the research

The conceptual framework represents the stages of evaluation, across the project lifecycle, on the horizontal axis, i.e., opportunity identification, priority setting, project approval, project

delivery, project closure, post-implementation and benefits realisation. Each stage of evaluation is referenced to concepts from the process, content and context model. Together, these constructs form the structure for studying effective evaluation practices.

Further, the framework proposes that effective evaluation practices are related to effective evaluation outcomes, leading in turn to improved IT project outcomes. Effective evaluation outcomes are based on *satisfaction* with evaluation practices, and an understanding of the strengths and weaknesses of practices, improvements, challenges, and lessons learned. Improved IT project outcomes are related to judgements of project success and failure, and *confidence* that IT projects are producing benefits.

2.9 Summary and Conclusions

This chapter explored the available literature regarding IT project evaluation, with an emphasis on effective evaluation practices. This information has been used to develop an overarching research problem, associated research questions and a conceptual framework.

In summary, this chapter reviewed the academic and practitioner literature on IT project evaluation, its relationship to IT project success and how the evaluation of IT projects can be improved. The results of this review were to:

- Summarise academic research on the topic of IT project evaluation;
- Identify themes and gaps in the literature;
- Confirm the basis for the research problem and questions; and
- Contribute to the research design through development of a conceptual framework.

The literature review revealed that while the problems with evaluating IT projects are well documented, the solutions proposed in the literature do not appear to be adopted in practice. Therefore, new methods and techniques suggested by researchers appear to have had a limited impact on improving IT project evaluation practice. Therefore, it could be argued that the failure to address evaluation problems contributes to the perennial problem of high IT project failure rates. As a result, there is a need for further research into *how* organisations can improve the evaluation of IT projects. Chapter 3 will next describe the methodology employed to conduct this research.

CHAPTER 3 RESEARCH DESIGN

3.1 Introduction

The previous chapter outlined the research issues and conceptual framework developed through a review of the extant literature. This chapter justifies the research paradigm and research method used, and explains the case study design, analysis, limitations and ethical considerations.

The overall approach of this exploratory study follows a qualitative *theory-building* paradigm rather than a theory testing one (Eisenhardt 1989). Mini-case studies were conducted in selected companies to acquire data and coding techniques borrowed from the grounded theory methodology were used for conceptualisation (Glaser & Strauss 1967; Glaser 1978). The approach adopted allowed an exploration of project evaluation grounded in rich empirical data, as recommended by Orlikowski (1993). This is a good strategy for discovery, offering a 'strong potential for revealing complexity' (Miles & Huberman 1994, p.10). This approach was also desirable because it aligned well with the need to achieve relevance and the desire to conduct rigorous qualitative research (Fernández & Lehmann 2005).

This chapter is organised as shown in Figure 3.1. The next sections describe and justify the research method used to identify effective IT project evaluation practices.

Figure 3.1: Chapter 3 outline

3.2 Justification for the Research Paradigm

3.2.1 Research Paradigms in Qualitative Research

All research is based on underlying assumptions or paradigms (Myers 1997). Based on different philosophical assumptions about reality and consequent preferences for its explanation, researchers have different positions on the nature of research philosophy. A research paradigm helps researchers select an appropriate research method and design (Guba & Lincoln 1994; Hussey & Hussey 1997).

Ontology, the study of being, refers to the nature of reality. Epistemology, the theory of knowing, is the relationship between that reality and the researcher. Methodology is the way that reality is investigated (Healy & Perry 2000). Myers (1997), based on work by Chua (1986) and Orlikowski and Baroudi (1991), suggests three research paradigms for qualitative research: positivist, interpretive and critical. While there are other proposed typologies (Guba & Lincoln 1994), the definitions provided by Myers (1997) are appropriate to this study.

The three research paradigms are described in Table 3.1 each with corresponding descriptions of ontology, epistemology and approaches. According to Myers (1997), the choice of research method is independent of the underlying philosophical position adopted and case study research may be positivist, interpretive or critical.

Table 3.1: Explanation of research paradigms (Myers 1997)

Research Paradigm	Ontology	Epistemology	Common Approaches
Positivist	Reality is objectively given and apprehensible	Possible to obtain objective knowledge	Formal propositions; Quantifiable measures; Test theory to increase predictive understanding of phenomena; Generalisation from sample to population
Interpretive	Reality is only imperfectly apprehensible through social constructions	Understanding through meanings and perceived knowledge	Does not predefine dependent and independent variables; Generate theories by allowing meaning to emerge; Concentrate on understanding and interpretation
Critical	Social reality is historically constituted through people	Understanding through social critique	Focuses on oppositions, conflicts and contradictions in contemporary society; Seeks to eliminate the causes of social, cultural and political domination

There is considerable disagreement over whether one study can accommodate more than one paradigm (Myers 1997). The distinctions described in Table 3.1 are not always clear and some authors argue that research paradigms may be usefully combined or considered a continuum (Kaplan & Duchon 1988; Lee 1991).

3.2.2 The Research Paradigm of the Study

The literature review in Chapter 2 showed that IT evaluation research has mainly focused on the methods or techniques for evaluation. There has been no comprehensive and systematic research into what practices are necessary for IT project evaluation to be effective and why they work. For this reason, the overall approach of this exploratory study follows a qualitative *theory-building* paradigm, where the emerging theory helps explain what is happening in practice (Robey & Markus 1998). According to Miles and Huberman (1994, p.10), qualitative data are advocated as the best strategy for discovery due to 'their *richness and holism*, with strong potential for revealing complexity'. A qualitative method is also deemed appropriate for the 'how' type of research question (Yin 2003). The positioning of this research is shown in Figure 3.2.

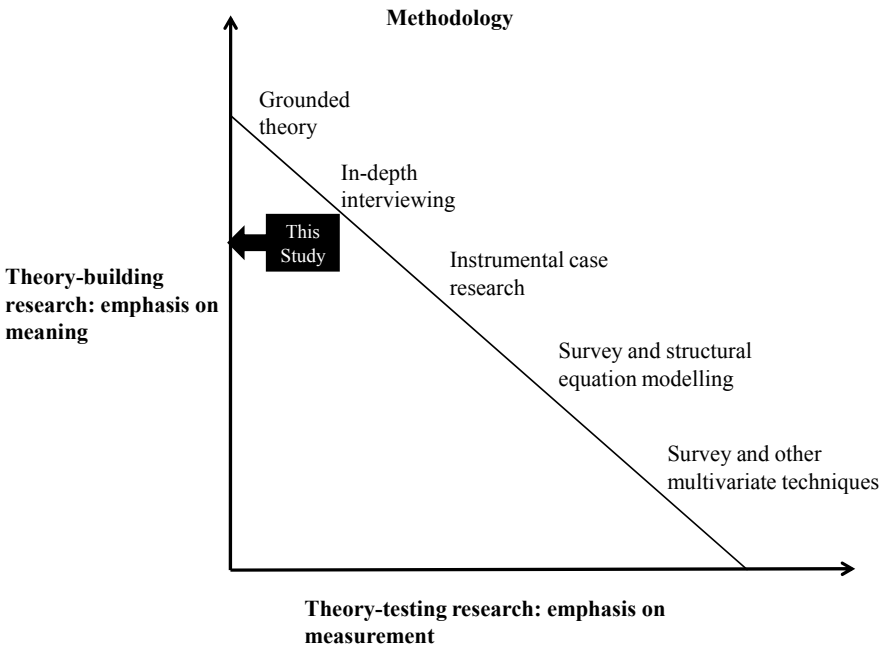

Figure 3.2: Research positioning, modified from Healy and Perry (2000)

The underlying epistemology of this study has aspects of both positivist and interpretive research paradigms. On the interpretive side, the research attempts to understand the phenomena of IT project evaluation through participants' understanding without predefining

dependent and independent variables (Kaplan & Maxwell 1994). However, the research also aims to generate a theory based on empirically valid conceptualisations emerging from the data, that implies that there is an objective reality (Eisenhardt 1989). This study is an attempt to understand the nature of that reality, even if it is incomplete.

In many respects, this research may also fit the description of realism where participant's perceptions are being studied 'because they provide a window into a reality beyond those perceptions' (Healy & Perry 2000, p.120). This form of realism is described as modified objectivist; there is a 'real' world to discover even though it is only imperfectly apprehensible (Guba & Lincoln 1994).

3.3 Building a Conceptual Framework

3.3.1 Literature Review

The purpose of the literature review was to survey the academic and practitioner literature on IT project evaluation, its relationship to IT project success and how the evaluation of IT projects can be improved. To achieve this aim, the literature on IT governance and evaluation was reviewed to describe current IT project evaluation practices, challenges and barriers. In order to better understand evaluation, key themes from the literature were identified in terms of the stages of IT project evaluation and then by the process, content and context of evaluation. Academic research on effective evaluation and IT project success was then summarised, gaps identified and a conceptual framework developed.

3.3.2 Conceptual Framework

A conceptual framework explains the key constructs to be studied and the presumed relationships among them (Miles & Huberman 1994). Even exploratory research should start with a framework to define what is to be explored (Yin 2003). Based on the literature review, a conceptual framework was developed to guide the design of the research instrument.

3.4 Selection and Justification of the Research Method

3.4.1 Case Study Method

The purpose of this study is to derive theory about IT project evaluation from empirical data. Given the theory-building nature of this research and the nature of the research questions, a case study design was selected as an appropriate method for this research. Case study research is particularly appropriate for the study of IS within organisations where theory and understanding are not well developed (Darke et al. 1998).

An embedded multiple case study design with several units of analysis was used for exploring which evaluation practices are more effective than others are. Case studies allow in-depth research using multiple sources of data, and are considered a sound research strategy for examining contemporary and complex phenomenon within a real-life context (Zikmund 2000; Yin 2003). Multiple case sampling provides confidence to findings and improves the robustness of emerging theory by allowing comparison between cases (Miles & Huberman 1994; Yin 2003).

A qualitative approach using interviews was adopted because it allowed a rich exploration of evaluation processes while remaining open to emergent issues. The primary unit of analysis in this study is the organisation. The higher industry level and lower project level were considered for context. Scheepers and Scheepers (2003, p.26) argue that 'a failure to consider these interdependent levels of context runs the risk of partial or even incorrect conclusions being drawn'.

3.4.2 Selection of Industry Sectors

Three Australian industry sectors were selected: Finance and Insurance (F&I); Mining (M); and Electricity, Gas and Water Supply (EG&WS), as classified by the ANZSIC. These three sectors were chosen because they offered varying levels of Information and Communication Technology (ICT) investment and seemed likely to cover a range of IT evaluation practices. As evidence of the likely range of practices, the Australian National Office for the Information Economy (NOIE) reports:

> *Australia has invested heavily in ICT, with expenditure on ICT now representing more than eight per cent of GDP [gross domestic product]. Sectors that have*

invested most heavily in ICT include finance, communications and utilities (electricity, gas, water), while ICT investment has been smallest in mining and agriculture (NOIE 2003, p.6).

3.5 Data Collection

3.5.1 Selection of Companies

Seventy-eight in-depth interviews were conducted with a total of 72 senior managers in 36 companies operating in the three industry sectors. The sample of companies was derived from a combination of purposeful, opportunistic and snowball sampling (Sarantakos 1998), which is relevant for theory building (Miles & Huberman 1994). Contact was made with participant companies through personal contacts of the researcher. Once the original round of interviews was completed using this sampling method, companies were selected and targeted to ensure that there was maximum variation in the size and type of companies interviewed in each sector. Sixteen companies contacted by the researcher did not respond or declined to participate due to availability or commercial sensitivities.

Table 3.2 summarises the participant companies by industry sector, size, focus of operations, and ownership.

Table 3.2: Mix of participant companies, by industry sector

Sector	Size (Annual Revenue)			Focus of Operations			Primary Ownership			
	<$A500m	≥ $A0.5 ≤ $A2b	>$A2b	AU State	AU National	International	AU Public	AU Private	Government	International
F&I	9	7	4	7	8	5	6	9	1	4
M	2	5	4	1	2	8	7	1	0	3
EG&WS	0	4	1	4	1	0	0	0	5	0
Total	11	16	9	12	11	13	13	10	6	7

Key: F&I = Finance and Insurance; M = Mining; EG&WS = Electricity, Gas and Water Supply.

The companies selected represent a diverse range of organisations by size, focus of operations, and ownership. The sample includes most of the top 20 companies by size in Australia.

3.5.2 Case Study Breadth and Depth

Two of the dimensions of case study research are breadth and depth, with breadth referring to the number of cases and depth the number of interviews within each case (Eisenhardt 1989). Given that evaluation processes were not known to the researcher at the time of case selection, mini-case studies (Weill & Olsen 1989) were conducted with a focus on breadth. Mini-case studies are appropriate for understanding practice-based problems and for conceptualisation (Changchit et al. 1998; Fearon & Philip 2005). A large number of companies were selected with sufficient interviews conducted to understand evaluation practices within each company and to provide triangulation of data. The aim was to select a diverse range of companies with both effective and ineffective practices, providing the opportunity for comparison and cross-case analysis (Yin 2003). Multiple cases 'help the researcher find negative cases to strengthen a theory, built through examination of similarities and differences across cases' (Miles & Huberman 1994, p.173).

There were 20 case study companies from the Finance and Insurance sector, 11 from Mining, and five from Electricity, Gas and Water Supply. A larger number of companies were selected from the Finance and Insurance sector due to the high level of ICT investment in this sector and the expectation that these companies would be leaders in IT project evaluation practice. This sector also offered greater diversity in terms of company size, focus of operations and primary ownership.

3.5.3 Selection of Participants

Since interviews were the primary source of data, care was taken to ensure that the person(s) selected were the most appropriate for each part of the interview. This selection process was done through an initial phone conversation. Those interviewed were CIOs, program office managers, project managers, or other senior managers involved in the evaluation of IT projects. All interviews were conducted by the author. The time taken for each interview ranged from 45 minutes to two hours, averaging one hour.

The interview process explored IT evaluation at various stages of the project lifecycle from opportunity identification, priority setting and project approval (*ex-ante evaluation*), through the stages of project delivery, then closure, post-implementation review, and benefits realisation (*ex-post evaluation*). The interview format had two parts. The primary interview was with a CIO, program office manager or equivalent. This interview focused on evaluation

practices in the participant company in general, including ratings of *satisfaction with IT evaluation processes*, and *confidence that IT projects were producing business benefits*. A secondary interview was conducted with a project manager and explored evaluation of a recently completed IT project. Participants' perceptions are a reasonable proxy for objective measures since they have been found to correlate strongly in research of IT business value (Tallon et al. 2000).

In addition to the interviews, documents relating to project management and evaluation practices were collected for contextual, informational and triangulation purposes. A total of 362 such documents were provided to the researcher. The use of multiple types of evidence to triangulate and cross check different views is advocated by Pettigrew (1990), Patton (1990) and Yin (2003). These interrelated sets of data were used to corroborate accounts of the evaluation processes within each company. In addition, this information provided the ability to identify, in some instances, discrepancies between the practices documented versus those actually in use.

3.5.4 Design of the Research Instrument

The interview questions were designed based on the research questions and key constructs to be studied from the conceptual framework. The interview questions were mainly of an exploratory nature, such as 'what?', 'how?' and 'why?' Probe questions were used to elicit more information and to keep the discussion focused, when necessary (Hussey & Hussey 1997).

The overall objectives of the interview process were to understand, in the Australian context:

1. To what extent formal evaluation processes are used;
2. At what stages of an IT project evaluation is used;
3. Why evaluation is conducted or not conducted at each stage;
4. Who conducts the evaluation and what processes are used;
5. The perceived strengths and weaknesses of the processes;
6. What evaluation criteria are considered;
7. If, how and when these criteria are measured;
8. How project success and failure are defined;
9. The relationship between evaluation practices and confidence in the value of IT projects;
10. What challenges are faced in conducting evaluation;

11. Whether there is a perceived need to improve evaluation processes; and
12. How these processes could be improved.

The research questionnaire was standardised to support internal validity, manageability of data and cross-case comparison (Miles & Huberman 1994). The initial questionnaire design was tested in the first two case study companies. The questionnaire was then modified and some additional questions added. The researcher then went back to the two original companies in order to answer the additional questions. The high-level interview questions for each type of participant are in Appendix 1.

Table 3.3 provides a summary of the key constructs of the research referenced to the interview questions in Appendix 1. The table demonstrates the clear links between the research questions, the key constructs from the conceptual framework and the interview questions.

Table 3.3: Definition of key constructs and their corresponding source of emergence (questions)

Research Sub-Question	Construct	Definition	Related Question(s) (*see Appendix 1*)
To what extent do organisations formally evaluate IT projects and why?	Formality of Evaluation Practices	The formality of the IT project evaluation practices used in the company	Primary interview questions 1–6 Secondary interview questions 5–9, 18–19
How do organisations evaluate IT projects?	Stages of Evaluation	The stages at which a company evaluated its IT projects, including Opportunity Identification, Priority Setting, Project Approval, Project Delivery, Project Closure, Post-implementation Review and Benefits Realization	Primary interview questions 3 Secondary interview questions 19
What are the most effective IT project evaluation practices used by organisations and why are they effective?	Overall confidence	The primary interview participant's rating of confidence that IT projects are producing business benefits	Primary interview question 10
	Overall Satisfaction	The primary interview participant's rating of satisfaction with IT evaluation practices	Primary interview question 14
	Effective IT Project Evaluation Outcomes	The outcomes of effective IT project evaluation practice in terms defined by the participant	Primary interview questions 3, 12–13, 15–16 Secondary interview questions 22–27
	Effective Evaluation Practices	Evaluation practices (process, content and context) that resulted in effective IT project evaluation outcomes and improved IT project outcomes	Primary interview questions 3 Secondary interview questions 18–21
How do organisations define IT project success?	Formality of Success Construct	The formality of the IT project success construct used in the company	Primary interview questions 7–9 Secondary interview questions 11–12
	Measurement of Success	Whether a company measured the success of its IT projects	Primary interview questions 3, 7–9 Secondary interview questions 11–12, 15–21
	Improved IT Project Outcomes	The outcomes of successful IT projects in terms defined by the participant	Primary interview questions 3, 11 Secondary interview questions 11–14

3.5.5 Case Study Protocol

A case study protocol is a research guide for the researcher and increases the reliability of case study research; a protocol is considered essential for multiple case studies (Yin 2003). A case study protocol was prepared for this study that covered: the research questions, conceptual framework, sampling outline, collection plan, field procedures and interview questions. Case study data was documented and organised as it was collected. The case study sampling outline is shown in Table 3.4.

Table 3.4: Case study sampling outline

Parameters	Criteria
Sectors	Financial & Insurance; Mining; Electricity, Gas & Water Supply
Unit of Analysis	Organisation
Participants	CIO; Program office manager; Project manager
Procedure	Telephone and e-mail contact; Letter of introduction and survey; In-depth interviews; Validation of interview; Collection of sample documents
Subject	IT Project Evaluation
Processes	Identification/Selection; Priority Setting; Project Approval; Post-implementation Review/Closure; Benefits Realisation

3.5.6 Conduct of Interviews

Interviews were conducted over a 14-month period between December 2005 and January 2007. The researcher maintained a record of contact with participants, and interviews. A qualitative approach using interviews allowed a richer understanding of evaluation processes than a survey. Personal interviews have a number of advantages: they enable the use of probing questions, reduce the likelihood of incomplete responses and also allow issues to emerge that were not anticipated (Zikmund 2000).

The interview questions were sent to respondents to consider before the interview. A covering letter of introduction also described the nature and purpose of the research. In some cases, the respondent answered the questions or made notes before the interview. Most interviews (70 per cent) were conducted face-to-face in private meeting rooms at the participant's workplace. Due to issues of geography and time, some interviews (30 per cent) were conducted by phone. In order to maintain consistency a single interviewer conducted all interviews.

Notes were taken during the interviews, transcribed within 24 hours and sent by e-mail to each respondent within one week of the interview for checking. This gave the participants the

opportunity to clarify any misunderstandings that may have occurred during the interview. Only minor changes were made by participants during this checking stage. Respondent validation is important to the reliability of interview data (Silverman 2001). Most companies were also followed up at least once by phone or e-mail to check interview details or provide additional information during the analysis stage. The interviews were not tape recorded since tape-recording can inhibit the interviewee from being open and truthful, and prevent the researcher from fully participating in the interview process (Walsham 1995, 2006). A summary of interviews is in Appendix 2.

3.6 Data Analysis

This study applied Eisenhardt's (1989) suggested steps for analysing data: (a) within-case analysis, (b) cross-case search for patterns, (c) shaping propositions, and (d) proposition verification. The interview notes (over 540 pages) and other supporting documents were examined for themes and coded (labelled) using open coding techniques borrowed from the grounded theory method (Glaser & Strauss 1967). According to Douglas (2003, p.53), 'business research case studies can be enhanced and strengthened by combining grounded theory research principles with exhaustive data collection and analysis'.

Responses to questions on *satisfaction with IT evaluation processes* and *confidence that IT projects are producing business benefits* were used to assess both effective and ineffective practices. Interview notes were analysed based on participant descriptions of the strengths and weaknesses of their company's evaluation practices, to determine effective IT project evaluation outcomes, such as accuracy, consistency and responsiveness.

The 36 case study companies were first analysed individually, then ranked and divided into groups based on the primary interview participant's ratings of *satisfaction* and *confidence*. The intent of the categorisation was not to be definitive, but to provide a means for understanding and comparing practices across companies. Effective practices were contrasted with ineffective practices. In addition, all practices were examined for their ability to address the significant evaluation challenges identified by the participants. While the general approach was to look for patterns in practices across companies, it was also recognised that effective practices might come from a single participant. Finally, to ensure the participants' anonymity, each company was given an identifier: F1 to F20 for the 20 Finance and Insurance

companies; M1 to M11 for the 11 Mining companies; and U1 to U5 for the five Electricity, Gas and Water Supply Utilities.

3.6.1 Within-Case Analysis

'Data reduction refers to the process of selecting, focusing, simplifying, abstracting, and transforming the data that appear in written-up field notes or transcriptions' (Miles & Huberman 1994, p.10). The starting data set was 78 interviews within the 36 case study companies. The individual interview responses were coded using Atlas Ti to identify themes and initial company-level summaries developed. The company summaries were organised by the key topics of the structured interviews and are presented in Chapter 4.

Initial coding started with broad categories based on the conceptual framework. A set of over 500 codes was then developed that were *grounded* in the data (Strauss & Corbin 1990). Each code was given an operational definition at the point it was created to help apply them consistently over time (Miles & Huberman 1994). In addition, memos were written and network diagrams developed throughout the analysis to stimulate coding and as a basis for theory integration and generation. Several iterations of coding and recording were completed until all incidents were classified and sufficient numbers of regularities emerged (Lincoln & Guba 1985).

3.6.2 Cross-Case Search for Patterns

Cross-case analysis deepens understanding and explanation (Miles & Huberman 1994). Eisenhardt (1989) emphasises the importance of cross-case pattern finding, refining constructs through connection to the data and remaining open to disconfirming evidence when it appears. Ideally, variables should be empirically meaningful in all cases but some may be unique or not present in all cases (Miles & Huberman 1994).

All of the codes developed were related to 25 categories of effective evaluation practice by examining both similarities and differences across companies. A meta-matrix (Miles & Huberman 1994) was then developed listing all of the companies in a ranking order based on the primary interview participant's ratings of *satisfaction with IT evaluation processes* and *confidence that IT projects are producing business benefits*. The matrix included columns for the 25 categories of effective evaluation practice, *culture/environment*, *evaluation maturity/journey*, and *evaluation outcomes*, both positive and negative. The 25 categories of

effective evaluation practice were rated for each company using a scale of high, medium or low based on further analysis of the underlying codes. A high rating represented strong evidence of a practice while a low rating indicated the absence of that practice. While the general approach was to look for patterns in practices, it was also recognised that effective practices might be represented in a single company.

3.6.3 Shaping Propositions

'The aim of coding is to arrive at systematically derived core categories that become the focal concepts that contribute towards theoretical development' (Douglas 2003, p.48). The findings from the collection of cases were used to define the characteristics of effective IT project evaluation. Categories were iteratively refined and reduced into six central codes representing 13 effective evaluation practices, based on the meta-matrix. 'A central category has analytical power. What gives it that power is its ability to pull the other categories together to form an explanatory whole' (Strauss & Corbin 1998, p.146). The outcomes of effective evaluation were also grouped and refined into five core codes. All of these categories were saturated with theoretical meaning (Douglas 2003).

The cross-case analysis and resulting theoretical propositions are presented in Chapter 5.

3.6.4 Proposition Verification

Conclusion verification involves drawing meaning from data and building a logical chain of evidence (Darke et al. 1998). The emergent relationships and model was examined for each case. Following replication logic, emergent relationships were tested and the model refined (Eisenhardt 1989; Yin 2003). According to replication logic, 'cases which confirm emergent relationships enhance confidence in the validity of the relationships' (Eisenhardt 1989, p.542).

During the verification stage, a number of tactics were employed including checking out rival explanations, ruling out spurious relationships and using extreme cases (Miles & Huberman 1994). A number of cases were discovered that disconfirmed relationships and provided an opportunity to extend the theory based on variables such as company size. The underlying theoretical reasons for the relationships were also teased out, helping to establish internal validity (Eisenhardt 1989).

Finally, an essential feature of theory building is comparison of emergent theory with the extant literature to enhance internal validity (Eisenhardt 1989). The findings from this study are compared with the literature in Chapter 6.

3.7 Quality of the Research Design

Yin (2003, p.34) describes four tests that can be used to establish the quality of any empirical social research: construct validity, internal validity, external validity and reliability. The tactics used in this research to address these tests are shown in Table 3.5.

Table 3.5: Case study tactics used in this research

Test	Case Study Tactics
Construct Validity	Logical chain of evidence; Data triangulation
Internal Validity	Cross-case patterns; Explanation building; Addressing rival explanations; Using extreme cases; Comparison of emergent theory with extant literature
External Validity	Replication logic
Reliability	Case study protocol; Case study records; Logical chain of evidence; Respondent validation

Construct validity was supported by a logical chain of evidence and the use of multiple data sources (Yin 2003). As demonstrated in Sections 3.5 and 3.6, the study was designed to ensure explicit links between the research questions, the interview questions asked, the data collected and the conclusions drawn. In addition, potential bias was minimised by the use of multiple interviews and secondary documents for data triangulation (Remenyi & Williams 1996; Irani et al. 2005).

A range of tactics were used to support internal validity including cross-case search for patterns, explanation of the underlying theoretical relationships, consideration of rival explanations, looking for disconfirming evidence, and comparison of the emergent theory with the extant literature (Eisenhardt 1989; Miles & Huberman 1994). The approach taken by this study adopted the key characteristics of rigorous case study research suggested by Yin (2003, p.137), including attention to *all* the evidence by using exhaustive analytical strategies, examination of *all* rival hypotheses or interpretations, and a focus on addressing the *most* significant issue.

External validity deals with knowing whether a study's findings can be generalised beyond the immediate case studies (Yin 2003). The findings from this exploratory study are based on

empirical evidence from 36 companies in three industries in Australia. The case-based study explored *real-life* projects in order to achieve conceptualisations grounded in professional practice, not to achieve generalisation. Yet, since the companies in this study are a diverse range of organisations by size, focus of operations and ownership; and the practices identified are related to management issues known to be important the world over, the findings could apply to other organisations due to the 'representativeness' of the sample (Seddon & Scheepers 2006) and the level of abstraction (Glaser 2001).

Finally, the reliability of this study was supported by the use of a case study protocol, comprehensive case study records and respondent validation of interviews. The use of Atlas Ti provided a clear and logical progression for analysis that creates an audit trail (Patton 2002). In addition, thorough reporting of the information provides confidence that the theory is valid (Eisenhardt 1989).

According to Eisenhardt (1989), theory building from cases has the potential to generate theory with less researcher bias because it generates novel thinking, leads to the development of testable constructs that are verifiable, and results in theory that is closely linked to evidence and likely to be empirically valid. The credibility of this research is supported by the approach that has been adopted to establish construct validity, internal validity, external validity and reliability.

3.8 Limitations

Several limitations of the research design are acknowledged. First, for six of the 36 participant companies, only one person was available for interview. While single participants were interviewed twice to cover both parts of the interview format, the ability to explore divergent views was limited in these cases. In these cases, the researcher relied on a single perspective and used company documents relating to project management and evaluation practices for contextual, informational and triangulation purposes.

Second, this study is limited in its sampling strategy as one may expect bias in the self-reported performance of the interviewed CIOs, program managers and project managers, given their role as providers of IT projects to the company. In addition, the views and actions of other decision-makers in the organisations were not accounted for. Being aware of this limitation, the researcher maintained openness and scepticism, triangulating the views of the

interviewees within each company whenever possible and seeking further evidence from their documents.

Third, researcher bias is acknowledged as a possible limitation of this study. The researcher is the primary instrument in qualitative research (Patton 2002). The researcher's background in management consulting may have had some influence on the approach adopted for data collection and analysis. At the start of each interview, the researcher's background was explained. At the time of the research, the researcher had not consulted in the field of IT or the industries studied. Therefore, while acknowledged as an unavoidable element of social research, the impact of researcher bias is expected to be low due to the researcher's awareness about the phenomenon, the measures taken to counteract potential bias and the continuous comparison of emerging concepts against the data to ensure the internal validity of emerging ideas.

3.9 Ethical Considerations

This research considered three essential ethical issues: addressing the recruitment of respondents using informed consent, conducting fieldwork to avoid harm to others and protecting confidentiality in reporting (Flinders 1992; Miles & Huberman 1994). This research was approved by the Southern Cross University Human Research Ethics Committee on 4 July 2005 (approval number ECN-05-77) and a renewal approved on 4 July 2006 (approval number ECN-06-93) to cover the period over which case study interviews were conducted.

3.9.1 Informed Consent

All participants were provided with a letter explaining the purpose of the study and what was being asked of them, the opportunity to participate or not, an assurance of confidentiality and anonymity, a copy of the interview questions, and an offer that each participant company would be sent a summary of the research results.

A consent form was signed by each interviewee before the interview. This form outlined the procedures to be followed, responsibilities of the researcher, freedom of consent, the ability to withdraw at any time, and points of contact for queries or complaints. The confidentiality and anonymity of information was also reiterated verbally at the beginning of each interview.

3.9.2 Fieldwork

Central to interviewing is the importance of obtaining rich data in ways that does not harm those being studied (Rubin & Rubin 2005). Interviews were approached based on honesty and trust between the researcher and participant.

The benefits to the participants were that they were listened to providing opportunity for reflection and the improvement of IT project evaluation practices. In addition, participants were provided updates and sent articles during the conduct of the study.

3.9.3 Confidentiality of Information

Confidentiality refers to agreements with a person or organisation about what will be done with their data, and anonymity refers to a lack of identifiers that would indicate which participants or organisations provided which data (Sieber 1992). As noted in Section 3.6, a coding system was developed for all participating companies to ensure confidentiality and anonymity. Each company was given an identifier: F1 to F20 for the 20 Finance and Insurance companies; M1 to M11 for the 11 Mining companies; and U1 to U5 for the five Electricity, Gas and Water Supply Utilities. All notes and materials were kept in a safe and secure environment by the researcher.

3.10 Summary of the Research Design

This chapter presented the research design of this study with a focus on the research paradigm, selection of the research method, data collection, data analysis, quality of the research design, limitations and ethics.

This exploratory study follows a *theory-building* paradigm. Mini-case studies were conducted in 36 companies in three industry sectors. Data and coding techniques borrowed from the grounded theory methodology were used to conceptualise and the approach adopted allowed an exploration of project evaluation grounded in rich empirical data.

A case study approach is particularly relevant to studies examining contemporary and complex phenomenon within a real-life context, where the purpose of the research is theory building rather than theory testing. The next chapter presents an overview of results and descriptions of the evaluation practices in each of the 36 case study companies.

CHAPTER 4 CASE ANALYSIS AND RESULTS

4.1 Introduction

The previous chapter presented the research design of this study and described the research method, data collection and data analysis. This chapter aims to provide an overview of results and descriptions of the evaluation practices in each of the case study companies. Company summaries are organised by the key topics of the structured interviews. The summaries provide valuable insights into *how* IT project evaluation is done in practice in 36 companies.

Insights into the practices of the 36 companies originate from the viewpoints of 72 senior managers, supported by the examination of project management and evaluation documents. The presentation of each case covers the profile of the company, challenges faced when conducting evaluation, identified improvements to evaluation and a summary of evaluation practices.

The purpose of the summaries is to contribute to three of the research sub-questions:

1. How do organisations evaluate IT projects?
2. To what extent do organisations formally evaluate IT projects and why?
3. How do organisations define IT project success?

This chapter is organised into six sections as shown in Figure 4.1. The cases are grouped and presented by industry sector. A discussion of findings case-by-case in this chapter is then followed by a synthesis across companies in Chapter 5.

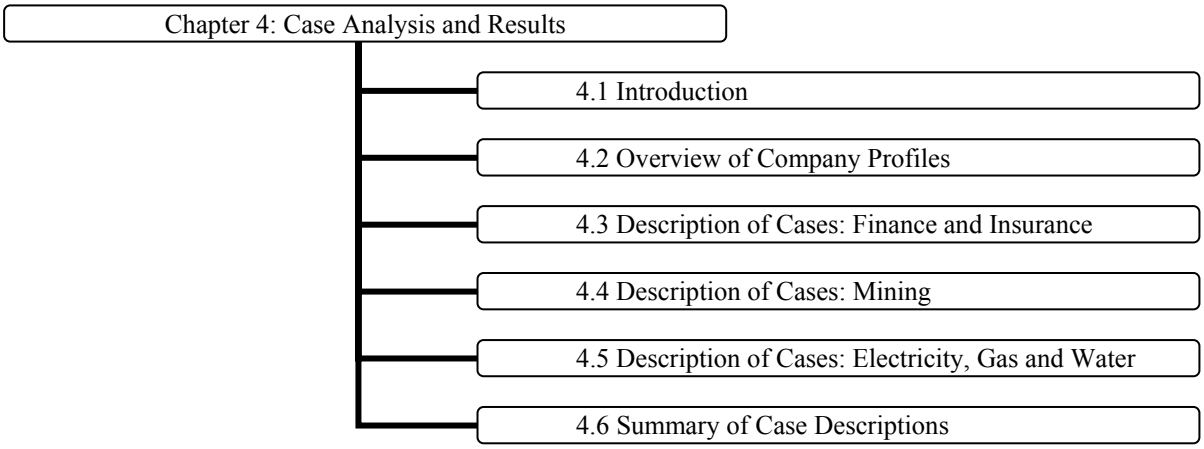

Figure 4.1: Chapter 4 outline

4.2 Overview of Company Profiles

4.2.1 Case Study Companies

Companies from three Australian industry sectors participated in this study: Finance and Insurance; Mining; and Electricity, Gas and Water Supply. As explained in Chapter 3, these three sectors were chosen because they offered varying levels of ICT investment and seemed likely to cover a range of IT evaluation practices (NOIE 2003). Table 4.1 presents a summary of the 36 companies that agreed to take part in this study.

Table 4.1: The 36 case study companies in this study

	Size (Annual Revenue)			Focus of Operations			Primary Ownership			
Company	<$A500m	≥ $A0.5 ≤ $A2b	>$A2b	AU State	AU National	International	AU Public	AU Private	Government	International
F1, F7, M1, M6, M8, M9			X			X	X			
F2			X			X				X
F6			X		X		X			
U4			X		X				X	
F3, M4, M7		X			X		X			
F4, F18		X			X			X		
F5, M3, M10, M11		X				X				X
F8		X		X						X
F9		X		X			X			
F14		X		X				X		
U1, U2, U3, U5		X		X					X	
F10, F13	X				X			X		
F11	X				X					X
F12, M5	X					X		X		
F15, F16, F19	X			X				X		
F17	X				X		X			
F20	X			X					X	
M2	X			X			X			
Totals:	11	16	9	12	11	13	13	10	6	7

Key: F = Finance and Insurance; M = Mining; U = Electricity, Gas and Water.

There were 20 case study companies from the Finance and Insurance sector, 11 from Mining, and five from Electricity, Gas and Water Supply. The companies are grouped in the table by their size, focus of operations and ownership. As shown by the 18 groups in the table, the sample of companies represents a diverse range of organisations.

4.2.2 Case Study Descriptions

During 2006–07, when the case study interviews took place, Australia was experiencing sound economic conditions, with low inflation, a modest increase in official interest rates and low unemployment.

Given the large number of cases, the descriptions of each company in this chapter are concise. As noted by Yin (2003, p.149), 'in a multiple-case study, the individual case studies need not always be presented in the final manuscript. The individual cases, in a sense, serve only as the evidentiary base for the study and may be used solely in the cross-case analysis'. Thus, the presentation of each case covers the profile of the company, a summary of evaluation practices, challenges faced when conducting evaluation and identified improvements to evaluation practice.

A table for each company (Tables 4.2–4.21 for Finance and Insurance companies, 4.22–4.32 for Mining, and 4.33–4.37 for Electricity, Gas and Water Supply) distils key aspects of each company's approach to IT project evaluation at different stages of the project lifecycle. Each table covers three topics: (1) company context, (2) ratings of *satisfaction* and *confidence*, and (3) descriptions of the use and effectiveness of it project evaluation at different project stages. The project stages follow those identified in the interview questions, namely, opportunity identification and selection, priority setting, project approval, closure, post-implementation review, and benefits realisation. A table that summarises all of the cases within each industry sector is contained in Appendices 3, 4 and 5.

A description of each case within the Finance and Insurance, Mining, and Electricity, Gas and Water Supply sectors is now presented in turn. The descriptions are valid at the point in time at which the interviews were conducted. The current tense is used since interviewees often described a mix of the past, the current situation and intentions for the future. It was important to clearly distinguish these time horizons to understand the evolution of IT project evaluation in the company.

4.3 Description of Cases: Finance and Insurance

4.3.1 Company F1

Company F1 is one of Australia's four major banks and is listed on the Australian Stock Exchange. The company is a large international operator with annual revenue exceeding $A2b.

Company F1 has formal project approval and tracking processes for managing any project that requires capital. There are no 'IT projects': only business projects. The CIO of company F1 had a medium level of confidence that IT projects are delivering benefits to the company. While the CIO has a high level of satisfaction with project selection, projects are considered expensive and there is a high failure rate. This was attributed to a lack of governance during project execution. In addition, post-implementation reviews (PIRs) lack formality and lessons learned are not used consistently. Thus, for company F1 the challenges faced in conducting evaluation are priority setting and efficient execution of projects. Improvements identified were better project comparison across the company to get the right mix of projects and the effective use of lessons learned.

The focus of company F1 is on *ex-ante* evaluation. The identification and approval process for projects is rigorous and consistent. Given the large size of the company, the planning process is long. However, there are flexible budget provisions for smaller projects (short duration or <$A250k) and pilots, with five to ten per cent of the budget put aside for these projects. The company has also shifted from priority setting within portfolios that created a stovepipe effect, to allocating resources to business areas across the company based on growth potential. Business cases are scaled, with greater detail for projects > $A250k. Projects follow a stage gate process and estimates are progressively refined at each gate. However, *ex-post* evaluation lacks rigour. The timing of the PIR at project closure is considered too early and there is confusion over its purpose: project administration, lessons learned or benefits realisation. In addition, results are not shared due to the potential for embarrassment. There is also a reluctance to stop projects, which results in wasted resources.

Business units and portfolios are accountable for their 'bottom line'. General managers sign-off on project benefits and the results are 'banked' into budgets. Individuals also have personal scorecards tied to financial incentives for overall results. There is strong

accountability for overall results, which drives positive behaviours. However, benefits for individual projects are not tracked.

The use and effectiveness of IT project evaluation in company F1 is summarised in Table 4.2.

Table 4.2: Summary of evaluation practices for company F1

Profile	Company	F1
	Size (Annual Revenue)	>$A2b
	Focus of Operations	International
	Primary Ownership	AU Public
Ratings	Satisfaction (Approach)	4
	Satisfaction (Deployment)	5
	Satisfaction (Results)	4
	Satisfaction (Improvement)	3
	Confidence	Medium
Practices	Identification/Selection	Rigorous planning process; 3-year horizon; Long (bureaucratic) process; Flexible budget provisions for projects/pilots of short duration and <$A250k
	Priority Setting	Corporate priority setting based on opportunities for growth; Program of Work managed at portfolio and business unit level; Flexibility; Difficulty finding the right balance of projects; Political influence
	Project Approval	Governance scaled to project value (two tiers); Rigorous; Consistent; Comprehensive cost and benefit estimates (over five years); Strong business engagement; Stage gates; Progressive refinement of estimates
	PIR/Closure	A PIR is conducted at closure by the Enterprise Program Office (for projects >$A250k); Lacks formality and rigour; Results not used consistently; Reluctance to stop projects
	Benefits Realisation	Benefits realisation plan; No tracking of benefits beyond the PIR; Benefits reflected in budgets; Business managers accountable for overall results but not individual projects

4.3.2 Company F2

Company F2 is a leading general insurance company with international ownership and operations. Annual revenue for the company exceeds $A2b.

Company F2 has formal evaluation processes and managers are held accountability for results. Processes are simple but effective, with satisfaction and confidence both high. This confidence stems from the governance around the approval and delivery of projects. There is a performance culture with strong accountability driven from the chief executive officer (CEO) and leadership team. For company F2, the challenges faced in conducting evaluation are maintaining a good IT-business relationship and the measurement of intangibles. The key

improvements identified are better understanding of business needs and expectations, and trend analysis of lessons learned.

For company F2, there is strong business engagement and ownership of processes. The relationship between IT and the business is one of shared responsibility and the IT department is not just an 'order taker'. IT customer relationship managers are used to guide the business through the process of raising an initiative. Although an annual planning process can limit the ability to react quickly, the process for identification of projects is flexible and there is a willingness to stop projects and reallocate resources if required. Priority setting is based on discussions, not formal criteria and weightings. Pilot projects are regularly used to prove or disprove concepts.

Following idea definition, a Terms of Reference (TOR) is developed that contains more detail about the IT project. The TOR covers benefits, scope, business case, high-level design and an estimate of costs. There is a focus on 'concrete' measures, and estimates are independently verified. There is flexibility to start work to a certain level before all approvals are finalised. The TOR is presented to *Program Promise* by the business owner (not by IT) for approval. Program Promise consists of chief general managers (CGMs) and has four key members: the CEO, CGM technical and operations, chief financial officer (CFO) and CIO. The group is called Program Promise because business managers are making a promise to deliver and are held to it. The process is quick and simple.

Projects follow a stage gate process with five approval gateways. The project stages are: initiation (gate 1); concept (gate 2); definition; design; build and test (gate 3); implement (gate 4); go live and support; project closure (gate 5); and benefits realisation. At each gate, the company is willing to ask the 'tough questions' and projects get 'knocked back'. Projects with a value >$A1m are reported monthly to Program Promise. The business owner is responsible for achieving benefits. Benefits are tracked and reported to Program Promise for all projects within 12 months of implementation. The CEO has a 'hands on' approach and is 'aware of all projects'. A project will not be closed until the benefits are realised.

The use and effectiveness of IT project evaluation in company F2 is summarised in Table 4.3.

Table 4.3: Summary of evaluation practices for company F2

Profile	Company	F2
	Size (Annual Revenue)	>$A2b
	Focus of Operations	International
	Primary Ownership	International
Ratings	Satisfaction (Approach)	4
	Satisfaction (Deployment)	5
	Satisfaction (Results)	4
	Satisfaction (Improvement)	3
	Confidence	High
Practices	Identification/Selection	Strong alignment to strategy; Driven from the business; IT customer relationship managers; Flexibility; Frequent use of pilots
	Priority Setting	Priority setting within each line of business; No formal criteria or weightings; Strong business engagement; Single executive appointed to 'arbitrate'; Whole of portfolio view
	Project Approval	Governance scaled to project value (three tiers); Stage gates; Independent verification of estimates; Accurate and robust; Single point of control through Program Promise; Top-leadership commitment; Quick and simple; Flexible
	PIR/Closure	PIR and closure combined; Lessons learned used; Pragmatic approach to stopping projects; Supported by PMO
	Benefits Realisation	Robust benefits realisation process; Strong emphasis on measurement; Independent verification of results; Benefits tracked until realised; Accountability to Program Promise

4.3.3 Company F3

Company F3 is a diversified financial services company providing banking, insurance and wealth management across Australia. Annual revenue is about $1.2b.

Company F3 has highly formal and sophisticated IT project evaluation processes but issues with these processes being followed consistently across the group. Large projects are managed centrally and processes are followed. However, smaller projects are managed by business units who control their own funding and do not always follow the mandated processes. Overall, evaluation processes and project governance structures are well established and confidence is high. This confidence is based on an organisational and IT culture that is focused on achieving value from IT-centric initiatives. There are also governance and measurement systems in place to ensure that benefits are identified and tracked.

For company F3, the challenges faced in conducting evaluation are obtaining good data, adequate consideration of alternative options, balancing projects with long and short-term

benefits, obtaining a corporate view of all initiatives, relating support projects to the 'hard' profit drivers, business engagement during *ex-post* evaluation, and understanding of the dependencies between projects. The key improvements identified were adoption of a portfolio management approach and a common rating system for group-wide selection of investments.

IT-enabled projects are classified according to their strategic importance, cost and impact. 'Type A' projects have a high business impact, high IT impact and cost more than $A100k to implement. The executive makes decisions on 'Type A' projects through the project governance committee, which is a subset of the executive. Processes for smaller projects exist but vary between business units. Compliance investments do not follow the same evaluation process, as they are deemed necessary to stay in business. In addition, there are separate but similar processes for IT initiatives with a high IT risk but a low business risk; these processes are managed by the IT initiatives portfolio. Company F3 has a comprehensive evaluation and benefits management process for 'Type A' projects. However, there was evidence that managers sometimes attempted to avoid this process by splitting projects. For example, the feasibility, analysis and design leader stated that projects may be broken into smaller initiatives to keep within project approvals and avoid formal evaluation.

Company F3 has a progressive ('gate') process for evaluation, including idea evaluation, investigation, detailed design, implementation, and benefits tracking. Approval is required at each gateway to continue. Costs and benefits are adequately identified, a five-year evaluation period is used for financial calculations and all assumptions are documented. Estimates are progressively refined from a 'Type 1' (+-50 per cent) estimate at idea evaluation to a 'Type 3' (+-10 per cent) estimate at implementation. Support for evaluation is provided by finance and trained business case/benefits management facilitators.

Post-implementation evaluation focuses on project management and vendor issues. The lessons learned from PIRs are collected but are not always fed back into future projects. The benefits management process used is rigorous. For company F3, all criteria (benefits) are measured and results chains are used to help define benefits and measures. Results are measured, checked and questions asked by the project governance committee. The committee tracks benefits until they were realised; usually six to 18 months after system implementation. Any proposal for a return becomes part of the budget for that line of business. Business unit managers are held accountable for overall performance but not the contribution of an individual project.

The use and effectiveness of IT project evaluation in company F3 is summarised in Table 4.4.

Table 4.4: Summary of evaluation practices for company F3

Profile	Company	F3
	Size (Annual Revenue)	≥ $A0.5≤ $A2b
	Focus of Operations	AU National
	Primary Ownership	AU Public
Ratings	Satisfaction (Approach)	4
	Satisfaction (Deployment)	2
	Satisfaction (Results)	3
	Satisfaction (Improvement)	3
	Confidence	High
Practices	Identification/Selection	80% of projects derived from strategy; Projects aligned to business line strategies rather than an overall group strategy
	Priority Setting	Priority setting using formal criteria (strategic fit, benefits and risk); Inconsistent application across the group; Focus on short-term returns
	Project Approval	Governance scaled to multiple criteria; Rigorous approval process; Accurate estimation; Progressive refinement of estimates; Independent verification of estimates; Some process avoidance
	PIR/Closure	Formal project closure; Independent PIR; PIR not applied consistently; Lessons learned not used
	Benefits Realisation	Formal benefits realisation process (for projects >$A100k); Benefits realisation plan; Baseline measurement; Use of results chains; Benefits tracked until realised; Benefits reflected in budgets; Supported by PMO; Accountability for results

4.3.4 Company F4

Company F4 is a privately owned wealth management company providing superannuation and investment products nationally. Annual revenue in 2005/06 was about $A1b.

Company F4 has standard procedures for major projects (>$A250k), which are applied with 'maturity' and 'flexibility'. All projects are treated as business projects. About three years earlier, the processes for IT projects were separate, process approval was inflexible and there were issues with inconsistency. Overall, satisfaction with processes is high and confidence is high. The evaluation challenges for company F4 are the growth of compliance projects, priority setting between projects and the attribution of revenue benefits to individual projects. The key improvement identified was education and communication to clarify the roles and responsibilities of the staff involved in evaluation.

Company F4 has two tiers of governance and classifies projects as either major (>$A250k) or continuous improvement (<$A250k). Major projects are identified during an annual strategic review and follow standardised procedures. Each business unit follows their own practices for continuous improvement projects, and processes are less standardised. Support for evaluation is provided by the program management office (PMO), which facilitates the setting of priorities, reviews business cases, assists with PIRs and maintains a library of lessons learned.

Priorities are set by the executive leadership team based on strategic value and risk. A budget is allocated based on these priorities. The process starts with a scoring system and ranking, which is then subject to a 'reality-check' by the executive. This allows the executive to cater for factors that cannot be accommodated by a formal scoring system, such as management knowledge, intangible benefits and infrastructure projects. While the company seeks a positive return on investment from projects, they are not 'fixated' on it.

Major projects follow six phases: (1) idea identification, (2) initiation, (3) planning, (4) design, (5) execution and (6) close-out/support. Each phase requires approval to proceed and there are three stage gates that provide funding for detailed planning and business case, technical design, and then implementation and testing. Some programs of work are also run using time-based stage gate processes. Thus, the individual projects go through the standard stage gate process and the overall program is funded for a set period. This allows close control of projects. There is also a high willingness to stop projects if they are not performing.

For company F4, a PIR is conducted four to six weeks after implementation. The PIR focuses on project success and lessons learned. Project success is judged against seven factors: stakeholder satisfaction, delivery of requirements, delivery of benefits, team satisfaction, time, cost and quality. These factors are base-lined at the start of a project and weighted according to the relative importance of the criteria. The PMO maintains a library of PIRs that are reviewed at the start of new projects; however, the use of lessons learned could be improved. Benefits management is linked to the measurement of overall performance against business plans. Thus, benefits realisation is not a stand-alone activity but part of the normal business review process.

The use and effectiveness of IT project evaluation in company F4 is summarised in Table 4.5.

Table 4.5: Summary of evaluation practices for company F4

Profile	Company	F4
	Size (Annual Revenue)	≥ $A0.5≤ $A2b
	Focus of Operations	AU National
	Primary Ownership	AU Private
Ratings	Satisfaction (Approach)	4
	Satisfaction (Deployment)	4
	Satisfaction (Results)	4
	Satisfaction (Improvement)	4
	Confidence	High
Practices	Identification/Selection	Annual strategic review; 3-year horizon; Strong alignment to strategy; Alignment to budget; Flexible provisions for out-of-cycle projects; Insufficient upfront analysis (sometimes)
	Priority Setting	Priority setting using formal criteria balanced with management judgement; Focus on value and risk; Facilitated by PMO; High willingness to stop and re-prioritise projects
	Project Approval	Governance scaled to project value (two tiers); Flexibility; Control of projects via stage gate process (for major projects); Independent verification of estimates
	PIR/Closure	PIR applied consistently; Focus on success and lessons learned; Success is judged against seven factors base-lined at the start of the project; Lessons learned used (but process needs to become embedded)
	Benefits Realisation	Benefits delivery plan prepared at first stage gate; Benefits realisation integrated with planning and budgeting; Rigorous tracking of expense benefits; Regular measurement linked to business plans

4.3.5 Company F5

Company F5 is an international funds manager providing financial advice, insurance, investments and superannuation. Annual revenue is about $A650m for the Australian operations.

Company F5 has formal software development and project management processes, and governance for all projects. The overall program is managed by a single central enterprise-wide PMO. The PMO administers and facilitates evaluation processes, manages projects, tracks benefits, and conducts analysis of program and portfolio results. Individual projects are managed within four business portfolios and are driven by the business (not by IT). The same evaluation processes are applied to both business projects and IT infrastructure projects. These processes are ‘mature’ and have been ‘proven’ to work for over six years. The application of processes has evolved from ‘moderate to heavy governance’ in the past to a more flexible approach.

The portfolio manager of company F5 had a high level of confidence that IT projects were delivering benefits, as measured through their benefits realisation process. For company F5, the challenges of evaluation are establishing a common basis for setting priorities between projects, and balancing the portfolio of infrastructure changes, growth in compliance projects and projects that drive strategic benefits (directly related to the company's six goals). While there was general satisfaction with evaluation processes, improvements included refining prioritisation processes, improving the consistent application of processes, and closer alignment of evaluation processes with strategy.

Company F5 has a performance culture with a focus on results and accountability at all levels. This focus is driven top-down from the senior management team. Results are reflected in the project sponsor's personal scorecard and performance is tied to financial incentives. For senior managers 20–60 per cent of salary is available in incentives and this gives a sense of 'energy' and 'motivation'. Benefits are also tied directly to budgets and there is internal charging of costs to support greater accountability.

The company manages about 100 projects per year. The annual planning process starts with the corporate strategy and cascades to business strategies. Potential projects must align to the company's six goals. Each business sets its own priorities for projects within an approved annual roadmap and funding allocation. Funding is centrally bid for and approved by a cross-functional leadership team, comprised mostly of a sub-committee of the executive. Projects proceed based on the approved priority list. Funding is centralised and each project needs to be justified using a business case. There is independent verification of all major assumptions by several bodies within the PMO, including a business case review team.

Company F5 uses an evaluation process with five stage gates across six phases: project initiation, strategic analysis (and high-level design), implementation planning (and detailed design), implementation, closure and benefits tracking. While the company uses stage gates to control projects, they are 'not slaves to the process'. Governance is scaled with 'light' processes and optional stage gates for less complex projects. There is also a high willingness to stop projects if there is an inability to implement or to deliver sufficient benefits. This may occur at any stage gate. There is a broad level of consultation for all stages of evaluation. However, sometimes 'it feels like you are collecting two cent coins', and there are 'too many cooks'. Ownership of the change can also become 'blurred'.

Benefits realisation is across three levels: benefits are monitored at a project level by key performance indicators (KPIs), the portfolio level by dashboards and finally rolled up to overall performance at the business level. The performance-measurement system in the company is well established and there is a view that all benefits can be easily measured. Benefits are tracked for 6–24 months after implementation (generally about 18 months). The PMO manages and tracks the benefits. Further, each KPI has an owner, a baseline, a minimum target and a satisfactory target. This information is reported to the management team monthly and managers are held accountable for meeting targets. This approach requires an amount of overhead but forces a 'value-based approach' to project prioritisation, management and decision making ('rather than emotions').

Success is judged formally based on project delivery and business benefits. Project delivery is measured out of 20 using a quality, delivery and cost (QDC) construct, and business benefits are measured by the agreed KPIs. Incentives are capped at 120 per cent of KPI targets to prevent under-estimation of benefits. Under-estimation of benefits is not common since overall corporate and business targets also have to be met. Management will also question 'soft targets' if people are seen to be trying to 'under-promise and over-deliver'. There is also a disincentive to overstate benefits since it impacts on individual scorecards. In addition, hurdle rates are not used, which also avoids the tendency to 'gloss up' benefits.

The use and effectiveness of IT project evaluation in company F5 is summarised in Table 4.6.

Table 4.6: Summary of evaluation practices for company F5

Profile	Company	F5
	Size (Annual Revenue)	≥ $A0.5≤ $A2b
	Focus of Operations	International
	Primary Ownership	International
Ratings	Satisfaction (Approach)	4
	Satisfaction (Deployment)	4
	Satisfaction (Results)	3
	Satisfaction (Improvement)	3
	Confidence	High
Practices	Identification/Selection	Annual strategic review; 3-year horizon; Strong alignment to strategy (six goals); Top-down; Driven from the business; Broad consultation; Rigorous; Process to manage out of cycle projects
	Priority Setting	Value-based approach to project prioritisation; High willingness to stop and re-prioritise projects; Focus on financial criteria
	Project Approval	Governance scaled to project complexity; Flexibility; Rigorous; Single point of funding control; Stage gates; Accurate estimation; Progressive refinement of estimates (at gates); Independent verification of estimates
	PIR/Closure	PIR conducted as part of closure; PIR mandated for all projects (not scaled); Centrally coordinated by PMO; Focus on learning; Lessons learned feed into project improvement program; Can be rushed due to time constraints
	Benefits Realisation	Benefits delivery plan prepared at third stage gate; Managed by PMO; Benefits tracked for 6–24 months; Benefits realisation integrated with planning, budgets, company KPIs and personal scorecards

4.3.6 Company F6

Company F6 is a large Australian bank listed on the Australian Stock Exchange. The company has annual revenue exceeding $A2b.

Company F6 has formal evaluation procedures for all projects, scaled to project value. The company has made significant progress with governance in the past three years but still views itself as ‘on the journey’. In particular, there are issues with applying evaluation processes consistently and a lack of top-level support from general executive managers.

The evaluation challenges for company F6 are resource constraints for PIRs, business engagement and process consistency. The key improvements identified were top management commitment and ownership, use of lessons learned, and clarification of evaluation roles and responsibilities. Thus, the confidence rating of the general manager project delivery executive

was medium, and satisfaction with the deployment of evaluation processes and the use of results was low.

The investment review committee (IRC) controls funding and is composed of the financial controller and business leaders, with the CIO and General Manager (GM) project delivery as invited participants. The budget is assigned based on the following project criteria: compliance, increase in revenue, decrease in costs, protect revenue or the customer, and research and development. Divisions fund projects from their own Profit and Loss (P&L) if a return is expected within 12 months but compete for Capital Expenditure (CAPEX) funding where the return is expected after 12 months. Budgets are allocated based on current contribution to profit and expected future contribution to profit.

The level of governance and delegations for approval vary according to the value of a project. There are five tiers: <$A15k, up to $A100k, $A100–200k, >$A200k-3m and >$A3m. The IRC only deals with projects >$A200k. Business ideas must be aligned with strategic objectives at group, division or business unit level. Projects are prioritised within business units based primarily on financial criteria, and cannot start without business sponsor approval. However, project selection criteria can be unstructured and inconsistent. In addition, project selection may be manipulated whereby a series of small projects, which are difficult to justify on their own, are rolled into a program of work by business units. There is also a tendency to overstate benefits in business cases in order to gain approval. Projects are always completed in three-month 'chunks' after a first stage of six months.

Project closure involves a project delivery assessment (PDA) and PIR, scaled to the value of the project. Each project >$A50k has a PDA completed by the IT program manager and business sponsor within three months of completion. The PDA focuses on schedule, budget and quality. For projects >$A1m, an independent PIR is conducted three to six months after implementation. A PIR may also be conducted by the project team for projects >$A200k that have significant issues ('red lights') during the project lifecycle. The results are reported to the IRC and project sponsor. However, lessons learned are not published or used. Projects that are stopped are considered failures.

General executive managers are held accountable for the overall performance of a division but not the contribution of individual projects. Benefits are identified in the business case but detailed benefits plans are not developed. In some cases, project benefits are reflected in

budgets. However, there are no specific reviews or activities associated with delivering benefits during implementation and no processes to measure benefits after implementation.

The use and effectiveness of IT project evaluation in company F6 is summarised in Table 4.7.

Table 4.7: Summary of evaluation practices for company F6

Profile	Company	F6
	Size (Annual Revenue)	>$A2b
	Focus of Operations	AU National
	Primary Ownership	AU Public
Ratings	Satisfaction (Approach)	3
	Satisfaction (Deployment)	2
	Satisfaction (Results)	2
	Satisfaction (Improvement)	4
	Confidence	Medium
Practices	Identification/Selection	Annual strategic review; 3-year horizon; Driven from the business; Broad consultation; Inconsistent selection criteria; Use of seed funding for scoping and pilot studies
	Priority Setting	Priority setting using formal criteria; Priorities set within business units; Focus on financial criteria
	Project Approval	Five tiers of governance based on project value; Single point of funding control (IRC); Uniform process for costing (Design and Costing Team); Some manipulation of processes
	PIR/Closure	PIR and closure combined; Scaled PIR; Independent review for large projects (>$A1m); Limited use of results; Lack of top-level support
	Benefits Realisation	Accountability for overall results; Benefits sometimes reflected in budgets; Inconsistent application of benefits measurement; No benefits tracking beyond the PIR

4.3.7 Company F7

Company F7 is a global general insurance company listed on the Australian Stock Exchange. Annual revenue exceeds $A2b.

Company F7 has a formal project management methodology that outlines evaluation processes, governance, and roles and responsibilities. There are two types of projects: Business projects that are reviewed by the board of management, and IT infrastructure projects that are managed by an IT council.

Overall, confidence is medium due to ‘previous failures’. While the program office manager was confident that the majority of projects were delivering benefits, there was uncertainty about whether the benefits expected were achieved since the ‘value capture review’ was not

applied consistently. The evaluation challenges for company F7 are justification of projects with intangible benefits, setting priorities between projects, having a common basis for project comparison across the business and understanding how 'real' estimated benefits are. The key improvements identified were introduction of a framework to continuously improve processes, increased senior management leadership and ownership of projects, simplification and streamlining of processes, consistent application of processes across the whole business, and education to improve understanding and adoption of evaluation processes.

There is a comprehensive mix of ways in which projects are identified, including maintaining existing systems and architecture, business projects to enhance delivery capabilities, business projects related to new products, and regulatory requirements. The business has a detailed staged approach and projects must align to one of five strategic imperatives. For example, low cost and alignment to channel distributors. In the past, there were 12 business units each with their own IT teams, which led to some fragmentation of systems; the company is now moving towards a shared services model and consistent processes are being implemented. The company has no proven framework for setting priorities and lacks the metrics required for formal priority setting. Therefore, priorities are influenced by the power of GMs, there is competition on the board of management and the 'regulatory card' is often used as a means to get projects approved.

Projects are classified as production issues, work requests (changes <$A100k) and projects (>$A100k). Project approval and management processes vary according to the value of the project, although the impact of a project may also be considered. All projects are approved in two stages. A project proposal provides the funds for the detailed requirements and business case. The project then progresses to a detailed business case and project charter. Approval of the business case provides the funds to proceed. However, for large projects this can also be broken down into phases (stage gates) with funds for each phase. Business cases are reviewed by the program office and estimates verified by an estimations review committee. However, the process is described as 'bureaucratic' with projects taking two to three months to be approved. To avoid delays processes are often manipulated with splitting of projects into a number of work requests rather than one large project.

Company F7 has a formal project closure process that is completed by the project manager two to three weeks after 'go live'. Closure is focused on project delivery versus requirements, budget and schedule. However, it is difficult for project managers to be 'honest' and they are

often ‘defensive’. A PIR, called the ‘value capture review’, is also conducted six to 12 months after implementation to measure benefits. The value capture review is conducted by someone independent of the project. While a process has recently been put in place following the centralisation of IT, it is not applied regularly or consistently. Sponsors (GMs) are not held accountable and results are not tied to budgets. However, there is now growing awareness of the need for accountability. The process of value capture is constrained by a lack of measurement systems in the company and difficulties attributing benefits to a project.

The use and effectiveness of IT project evaluation in company F7 is summarised in Table 4.8.

Table 4.8: Summary of evaluation practices for company F7

Profile	Company	F7
	Size (Annual Revenue)	>$A2b
	Focus of Operations	International
	Primary Ownership	AU Public
Ratings	Satisfaction (Approach)	4
	Satisfaction (Deployment)	2
	Satisfaction (Results)	3
	Satisfaction (Improvement)	3
	Confidence	Medium
Practices	Identification/Selection	Comprehensive; Strong alignment to strategy (five strategic imperatives); Lack of business ownership; IT-business relationship issues; Improving with centralisation of IT
	Priority Setting	No formal criteria or weightings; Political behaviour; Focus on financial criteria; Intent to formalise
	Project Approval	Governance scaled to project value (and impact); Formal; Rigorous; Bureaucratic; Lacks flexibility; Independent verification of estimates; Wasted resources; Process avoidance/manipulation; Stage gates (for large projects)
	PIR/Closure	Formal closure and PIR (‘value capture review’); PIR and closure not applied regularly or consistently; Project managers defensive
	Benefits Realisation	Not applied consistently; One-off process; No benefits tracking beyond the PIR; Company measurement systems limited; Intent to formalise benefits realisation

4.3.8 Company F8

Company F8 is a regional bank that is owned by an international parent company. Annual revenue in 2005 was about $A1.3b.

Overall, confidence is medium. The evaluation challenges for company F8 are financial justification of projects, continuity of business stakeholders and benefits realisation. The

company measurement systems are not geared to measure the level of granularity required to track benefits. The key improvements identified were an improved classification model for scaling the level of project governance and simplification of processes to reduce bureaucracy.

There is a minimum standard across the group that articulates the processes, templates, procedures and governance to be applied to all projects. The same processes apply to projects driven by the business that have an IT component, and projects driven from IT such as infrastructure projects. Each line of business has a five-year plan. If there is a change in direction, and a new project is initiated, a line of business cannot change the budget but they can cancel another project and reallocate the budget. However, the business is still expected to meet revenue targets set and cannot 'roll over' budgets into the following financial year. For this reason, there is pressure on projects not to 'jump' financial years.

Each division has a project prioritisation group (PPG) and PMO. The PPG reviews and approves project initiation proposals (PIPs) and business cases, reports on the status and benefits of the portfolio, and prioritises projects. The PMO prepares materials, provides quality assurance and has a role on the PPG. Assumptions and numbers are challenged by the PMOs, divisional finance, and managers who have sign-offs in the business case before it finally reaches the PPG.

The process starts with a PIP that is used to lobby for funds in the budget. The PPG reviews the PIP and if it is in line with company strategic direction and capacity then it is approved. PIPs are inputs to the planning process. Once approved, a detailed business case is then developed. A two-stage approval process is used. The initial stage (project initiation) is an approval to proceed with the business case. Usually, the project initiation will seek limited funds to finance a study, review alternatives, complete technical design and prepare a formal quote. The output is then used to prepare a formal business case (second level approval), after which the project can commence. These processes are well defined and robust. Estimation is also improving, although there is often a gap between the expectations of IT and the business.

The prioritisation criteria used by the PPG are 'loose' and formal scoring is not a strong feature. However, the view is that there is only a need to prioritise if there is a conflict. In these situations, the PPG makes the decision or the executive if it is a cross-divisional project.

A PIR is conducted by the project manager as part of project closure. This occurs within one month of implementation and is focused on project management effectiveness and lessons learned. The results are sent to the sponsor and PMO, and shared with all project managers. The current process of benefits realisation is inadequate but is improving as the result of attempts to make managers more accountable for outcomes and to incorporate benefits from business cases into two-year budgets. Group strategy reports to the CEO on larger projects and divisions must prove that benefits have been realised. However, it is often difficult to attribute results to a particular project. While there is no defined end point for tracking benefits, it is usually within one year. Ultimately, the division heads need to achieve the overall targets set in the five-year plan and have a vested interest and accountability for the success of projects. There are 'big consequences' for not meeting company targets.

The use and effectiveness of IT project evaluation in company F8 is summarised in Table 4.9.

Table 4.9: Summary of evaluation practices for company F8

Profile	Company	F8
	Size (Annual Revenue)	≥ $A0.5≤ $A2b
	Focus of Operations	AU State
	Primary Ownership	International
Ratings	Satisfaction (Approach)	4
	Satisfaction (Deployment)	4
	Satisfaction (Results)	3
	Satisfaction (Improvement)	4
	Confidence	Medium
Practices	Identification/Selection	Annual strategic review; 5-year planning horizon; Rigorous; Strong alignment to strategy; Alignment to budget; Use of pilots
	Priority Setting	Priority setting within each division (project prioritization groups); No formal criteria or weightings
	Project Approval	Robust; Well defined; Accepted part of business; Bureaucratic; Some process avoidance; Independent verification of estimates
	PIR/Closure	PIR conducted as part of closure; Lessons learned used; Completed by project manager (not independent)
	Benefits Realisation	Inadequate (but improving); Use of benefits delivery plans; Accountability for overall results; Difficulties measuring benefits; Intent to formalise benefits realisation

4.3.9 Company F9

Company F9 is an Australian regional bank offering mortgage loans for home buyers, business lending, savings and investment facilities, and insurance. Annual revenue is about $A800m.

Overall, the CIO was highly confident that projects are delivering benefits to the company. The evaluation challenges for company F9 are balancing long-term and short-term needs, measuring benefits and ensuring that projects align with business strategy. The key improvements identified were improved alignment with long-term strategy, better criteria for prioritisation, and balancing short-term 'spot fires' with long-term needs. These have started to be addressed by the introduction of a framework for evaluating projects (*ex-ante* and *ex-post*) based on strategic alignment, IT architecture alignment, financial return, competitive analysis and regulatory compliance.

There are dedicated resources and detailed procedures to support project evaluation. Project opportunities are identified either through business units (supported by IT relationship managers), or the business transformation group that is focused on business reviews and project delivery. Sometimes the IT relationship managers are treated by the business just as 'order takers'. Both business transformation group and IT (architecture and policy, application development, and delivery) report to the CIO.

Project governance is scaled to the cost of the project, although the company is considering classifying projects by expected benefits in the future. The IT Steering Committee (ITSC), composed of a cross-section of executive managers, meets monthly to track, approve and prioritise larger projects (>$A200k or 200 workdays). Smaller projects are approved and prioritised by a business initiatives steering committee composed of a broad cross-section of managers. However, there are no formal criteria for setting priorities and only informal links to long-term strategy.

Company F9 uses a stage gate process with projects managed in six phases: (1) concept, (2) start-up, (3) analysis, (4) development, (5) implementation and (6) closure. Each stage gate has deliverables that go to the ITSC and a decision is made to proceed or not proceed. Estimates are progressively refined from +100 per cent, -50 per cent (concept estimate) during the concept phase, to +50 per cent, -25 per cent (planning estimate) at the start-up phase and +20 per cent, -10 per cent (detailed estimate) at the analysis phase. Projects are tightly controlled based on tolerances set by the ITSC. A project closure report is completed at the end of each project including all 'sign-offs' required to go into production. Three months later a PIR is conducted that focuses on project management and lessons learned. A benefits realisation review is then conducted six months after the PIR. Project sponsors are accountable for benefits realisation and the process is driven by the business transformation

group. There are dedicated resources for both the PIR and benefits realisation review. Benefits are not overstated to get approval since the culture is conservative and benefits claimed are factored into budgets. The project benefits review is submitted to the board and they nominate when next to review the benefits. This is on a case-by-case basis. The process was recently defined (in the past three months) and is now being conducted consistently.

The use and effectiveness of IT project evaluation in company F9 is summarised in Table 4.10.

Table 4.10: Summary of evaluation practices for company F9

Profile	Company	F9
	Size (Annual Revenue)	≥ $A0.5≤ $A2b
	Focus of Operations	AU State
	Primary Ownership	AU Public
Ratings	Satisfaction (Approach)	4
	Satisfaction (Deployment)	3
	Satisfaction (Results)	3
	Satisfaction (Improvement)	2
	Confidence	High
Practices	Identification/Selection	Three-year plans, roadmaps and architecture framework; Broad consultation; Combined IT and business perspectives; IT relationship managers; Informal links to long-term strategy
	Priority Setting	Priority setting by ITSC (projects >$A200k); *Ad hoc* application of process; No formal criteria or weightings; Intent to formalise
	Project Approval	Formal project governance; Governance scaled to project value; Stage gates; Independent verification of estimates (projects >$A200k); Progressive refinement of estimates
	PIR/Closure	Formal closure and PIR; Independent PIR conducted three months after closure; Broad consultation; Lessons learned widely reported; Lessons used to continuously improve project management methodology; Dedicated resources
	Benefits Realisation	Benefits delivery plan prepared at project start-up; Benefits review six months after PIR; Ongoing tracking of benefits (as required); Consistent application; Benefits reflected in budgets; Company measurement system (dashboards)

4.3.10 Company F10

Company F10 is a funds management company owned by one of Australia's four major banks. Annual revenue is less than $A500m.

Overall, satisfaction with processes is high and confidence is high. The key evaluation challenges identified were sustaining a strong IT-business relationship given turnover in

senior level management, and understanding the degree to which project success contributes to company performance. No major improvements were identified, with evaluation processes being continuously reviewed and improved. According to the CIO, the effectiveness of evaluation is not about the processes themselves but how they are used.

Company F10 has formal evaluation processes and governance for all projects, where a project is defined as more than 20 workdays. Smaller work is classified as a systems change request and has 'lighter' processes. Opportunities are raised in an open environment using an 'idea template'. Opportunities are then classified as revenue raising, improved efficiency or compliance. The process is quick and flexible with the ability to stop projects before too much money is spent. It is difficult to estimate costs upfront and therefore the business needs to constantly re-prioritise. Projects >$A5m are approved at the group (parent company) level. These projects follow the parent company processes that are bureaucratic, cause delays and waste resources.

A project starts with a project statement that is approved by the executive team and provides the basis for setting priorities between projects. Prioritisation occurs at a divisional level and then at the company level. While there is no formal discipline to priority setting, projects are discussed based on the project statements and alignment to strategy. Business cases then get developed in order of priority. Estimates may not be 100 per cent accurate upfront but they are progressively refined, saving time and resources. Projects are continuously measured and monitored. The company uses a stage gate process with health checks and there is a high willingness to stop projects. One or two projects are stopped each year, irrespective of sunk costs. Overall, the processes are simple, established, well understood and applied consistently.

At the completion of a project, there is a closure process and six months later a PIR. Both reports are brief and results are fed into the continuous improvement process. Lessons learned are also discussed in project manager forums. However, employees are busy working on new projects and there is a lack of interest in completing PIRs.

Company F10 has a performance culture with top-leadership commitment. The company views results from an overall business perspective. Benefits for individual projects are identified upfront but are not formally tracked. This is because it is difficult to attribute business results to specific projects and formal benefits tracking is not considered 'worth it'.

We use the 'bull-shit meter' which is based on the culture of the executive team. There are ten general managers in the executive who would give someone a hard time at a meeting if the benefits do not stack up. They make decisions as a joint executive team (Chief Information Officer, F10).

The use and effectiveness of IT project evaluation in company F10 is summarised in Table 4.11.

Table 4.11: Summary of evaluation practices for company F10

Profile	Company	F10
	Size (Annual Revenue)	<$A500m
	Focus of Operations	AU National
	Primary Ownership	AU Private
Ratings	Satisfaction (Approach)	5
	Satisfaction (Deployment)	5
	Satisfaction (Results)	4
	Satisfaction (Improvement)	4
	Confidence	High
Practices	Identification/Selection	Open environment; Strong alignment to strategy (corporate priorities); Selection of the right projects; Coordinated by project review group; 12-month forward project planning (project portfolio roadmap)
	Priority Setting	Priority setting at divisional then company level; No formal criteria or weightings; Tolerance for intangibles; Timely decision making; Effective resource allocation; Whole of portfolio view; Focus; High willingness to stop projects
	Project Approval	Governance scaled to project value; Single point of funding control; Stage gates; Simple; Flexible; Progressive refinement of estimates; Independent verification of estimates; Well understood; Mature (4 years); Consistent application of processes
	PIR/Closure	Formal project closure and PIR; PIR conducted six months after closure; Centrally coordinated by PMO; Simple; Flexible; Lack of interest in PIR; Results shared and used in continuous improvement process (but can be improved)
	Benefits Realisation	General managers accountable for overall results; Company measurement system; Baseline measurement of benefits; Some measurement of individual project benefits in the PIR

4.3.11 Company F11

Company F11 is an international funds management company with a small Australian operation (annual revenue <A$20m) focused on long-term savings and investment products.

Overall, confidence is medium. The CIO was not fully confident that IT projects are delivering benefits to the company because benefits are not measured. The main evaluation challenge for company F11 was aligning projects to strategy. The key improvements identified were ensuring that project governance processes were consistently applied and managers were accountable for benefits realisation.

A standard project governance framework is applied to all company projects, including IT infrastructure projects. A project is defined as an activity that is greater than $A50k or 30 days effort from initiation to implementation. This approach has been in place for eight months and governance processes are described as 'immature'. The company takes a three-year strategic view and projects are identified across this period using a project proposal form. IT priority meetings are held quarterly to review current projects and new ideas. All projects must align to one of three key drivers: strategic, cost reduction or legislation. However, according to the CIO, the system does not achieve an appropriate balance of projects in the portfolio. Strategic projects are often 'pushed' above compliance projects and system enhancements.

All projects follow a six-stage process, irrespective of size: (1) project concepts, (2) initial investigation, (3) project selection, (4) business justification (business case and high-level requirements), (5) project planning and execution, and (6) benefits realisation. Each stage has mandatory and optional steps allowing some flexibility. However, while there is a standard process now in place it is not applied consistently. The IT department is constantly educating the business on the process.

A formal PIR is conducted by the project manager as part of project closure. The PIR is focused on project management processes and lessons learned. However, some project managers are uncomfortable facilitating PIR meetings with senior stakeholders. Benefits and costs are not adequately identified or measured. There is no accountability for benefits realisation and no follow-up. This is attributed to the difficulties with measuring benefits that change and evolve over time. There is evidence that benefits are overstated and this is tied to the lack of accountability. Thus, measurement is limited, and measures of success are not defined beyond quality and schedule. There is also a low willingness to stop projects once they are underway.

The use and effectiveness of IT project evaluation in company F11 is summarised in Table 4.12.

Table 4.12: Summary of evaluation practices for company F11

Profile	Company	F11
	Size (Annual Revenue)	<$A500m
	Focus of Operations	AU National
	Primary Ownership	International
Ratings	Satisfaction (Approach)	3
	Satisfaction (Deployment)	4
	Satisfaction (Results)	2
	Satisfaction (Improvement)	5
	Confidence	Medium
Practices	Identification/Selection	Annual strategic review; 3-year horizon; Alignment to strategy (three key drivers); Transparent; Difficulty achieving the right mix of projects
	Priority Setting	Priority setting by executive management group (projects >$A50k); No formal criteria or weightings; Intent to setup PMO to conduct initial selection; Low willingness to stop projects and re-prioritise
	Project Approval	Governance not scaled; Simple; Flexible (optional steps); Focus on financial criteria; Benefits and costs not adequately identified; Benefits overstated; Process avoidance/manipulation; Inconsistent application of processes
	PIR/Closure	Formal PIR conducted as part of closure; Standardised process; PIR within three months of implementation; Completed by project manager (not independent); Some project managers lack skills to conduct PIR
	Benefits Realisation	Lack of accountability; Benefits and costs not measured; Measures of success are not defined beyond quality and schedule; Intent to formalise benefits realisation

4.3.12 Company F12

Company F12 is a financial services company that provides investment products, stock broking, financial advice, and investment and merchant banking. The company is privately owned with international operations and annual revenue less than $A500m.

Overall, confidence that IT projects are delivering benefits to the company is low. There is no measurement of benefits and evaluation is based on ‘gut feelings’. The major evaluation challenges identified were business engagement, the IT-business relationship, priority setting, clarity of roles and responsibilities, access to data for measurement and updating processes to reflect the changing nature of IT work. The key improvements identified were implementing formal IT governance processes and tools to manage the IT portfolio, improved project management rigour, committing more resources and authority to the PMO, and increasing the profile of IT within the business.

Evaluation procedures are not well documented and are applied inconsistently. A project is defined as an activity that is greater than $A50k. IT business relationship managers work with the business to identify IT projects as part of the annual budget process. However, the process is informal and generally not linked to strategic plans. There is insufficient upfront analysis of opportunities and a lack of project governance. This results in many 'surprises' down track. There is the intent to implement an IT governance system to formalise these processes.

All projects are evaluated and prioritised by the ITSC. There are three stages of evaluation: (1) work request, (2) business initiative and (3) business case. However, the process is viewed as bureaucratic and the first two stages are generally skipped. Evaluation usually takes the form of a business case produced by the IT business relationship manager and signed off by the business sponsor. The IT department often finds out about the purchase of IT systems after the event or opportunities are identified at the last minute with little forward planning. Priority setting is not based on formal criteria and 'whoever shouts loudest' gets priority. The most business critical projects focusing on reducing costs or increasing revenue tend to secure resources; however, this is at the expense of technology and infrastructure projects that have longer term or less tangible benefits. The PMO tends to focus on administration and adds little value to the process.

A PIR process is completed by the project manager supported by the PMO. The PIR involves using 'six thinking hats' to discuss project management effectiveness with the IT team (not the business). However, the PIR is not mandated and is not always completed. There is a lack of interest in completing PIRs since the project manager is generally focused on their next project. In addition, the results of the PIRs are stored in a repository but nothing is done with them.

For large projects, benefits are sometimes identified upfront but they are not measured. Benefits are not overstated because they are generally not well articulated. Project success is not formally defined and a project is considered successful if the system is used, and was delivered on schedule and budget. There is a lack of data available to determine success or failure. Company F12 intends to implement a benefits realisation process as part of the PIR.

The use and effectiveness of IT project evaluation in company F12 is summarised in Table 4.13.

Table 4.13: Summary of evaluation practices for company F12

Profile	Company	F12
	Size (Annual Revenue)	<$A500m
	Focus of Operations	International
	Primary Ownership	AU Private
Ratings	Satisfaction (Approach)	3
	Satisfaction (Deployment)	2
	Satisfaction (Results)	1
	Satisfaction (Improvement)	2
	Confidence	Low
Practices	Identification/Selection	Annual budget process; Driven from the IT department; Lack of business ownership; IT relationship managers; No forward planning; Not aligned to strategic plans; IT-business relationship issues
	Priority Setting	Priority setting by ITSC (projects >$A50k); Supported by PMO; No formal criteria or weightings; *Ad hoc* process; Insufficient upfront analysis; Political behaviour; Difficulty finding the right balance of projects
	Project Approval	Governance not scaled; Single funding approval; Process perceived by the business as bureaucratic; Process avoidance/manipulation; Inconsistent application of processes; Intent to formalise evaluation processes
	PIR/Closure	Formal PIR process (using Six Thinking Hats); Informal project closure; PIR not mandated; PIR not applied consistently; Completed by project manager (with the project team); Lack of interest in PIRs; Lessons learned not used
	Benefits Realisation	No benefits realisation process; Benefits not measured; Lack of accountability; Limited company measurement; Success is not formally defined; Intent to formalise benefits realisation

4.3.13 Company F13

Company F13 provides superannuation and other investment products through financial advisors. The company is owned by an Australian bank and annual revenue is about $A150m.

Overall, the confidence rating of the associate director IT development was medium. This is because there is a lack of empirical evidence to show whether benefits are achieved or not. The main evaluation challenges for company F13 were having a common basis to compare projects with different drivers, and balancing the short-term and long-term. The key improvement identified was using lessons learned to develop a ‘corporate memory’.

There is an annual strategic planning process and a three-year strategic plan. There is a good balance between the rigour of a planning and budgeting process, and the flexibility to make changes. IT opportunities are identified through product innovation, operational risk and service transformation processes. While there are formal governance structures, such as

steering committees, there is ‘not a lot of science’ to identifying opportunities. The processes tend to rely on manager ‘gut feel’ rather than facts and data, since managers are too busy ‘fighting the crocodiles’. Thus, the ‘squeaky wheel’ tends to get attention or the latest disaster, and the best projects are not always selected.

A program of work is submitted to the parent company for funding. Overall, about $A11m of an $A13m program would be IT-related projects. Priority setting is based on a round table discussion between directors. There is a two-tiered approach to project governance. Projects that are greater than $A20k but less than $A200k follow an internal company process and require a project initiation form. Projects that are greater than $A200k follow a parent company process and require a business case that goes to an IRC. The unwritten rule is that projects should pay for themselves within three years. In reality, approval is very much about influencing decision-makers not the business case and benefits are often overstated. In the case of the IRC, only one decision maker has a good understanding of what the company does and for that reason, the decision process tends to fall back to financial criteria (a ‘bean counters’ approach). The process in bureaucratic and it takes about 10 weeks from completing the business case to approval. Once approved, all projects are overseen by an ITSC.

At the completion of a project, there is a formal project closure process. A project closure report is produced by the project manager and focuses on how the project performed and lessons learned. Project success is formally defined during project initiation using a balanced scorecard approach that covers finance, customer, process and team. These reports are presented to project sponsors and discussed at monthly project manager meetings. There is a formal benefits realisation process for projects greater than $A200k. However, this is a one-off process like a PIR and is rarely carried out. The IRC needs to prompt the business to complete the process and if it is completed it is generally late. While the intent is to get someone independent to complete the review the process is applied inconsistently and the person who completes the review is rarely the person identified in the business case. There is no accountability for realising benefits and no links between project benefits and budgets.

The use and effectiveness of IT project evaluation in company F13 is summarised in Table 4.14.

Table 4.14: Summary of evaluation practices for company F13

Profile	Company	F13
	Size (Annual Revenue)	<$A500m
	Focus of Operations	AU National
	Primary Ownership	AU Private
Ratings	Satisfaction (Approach)	4
	Satisfaction (Deployment)	3
	Satisfaction (Results)	2
	Satisfaction (Improvement)	4
	Confidence	Medium
Practices	Identification/Selection	Annual strategic review; 3-year strategic plan; Flexibility; Formal governance structures; Subjective; Reactionary; Focus on short-term; Political behaviour
	Priority Setting	Priority setting by directors; No formal criteria or weightings; Whole of portfolio view; Intent to formalise
	Project Approval	Governance scaled to project value (two tiers); Single funding approval; Focus on financial criteria; Rigorous; Willingness to reject projects; Broad consultation; Benefits overstated; Bureaucratic
	PIR/Closure	Formal project closure and PIR (benefits realisation); PIR conducted within 12 months after closure; Project closure is consistent and mature; Success is formally defined by a balanced scorecard for each project; Use of lessons learned (but can be improved)
	Benefits Realisation	Formal benefits realisation process (for projects >$A200k); Not applied consistently; Benefits realisation plan in business case; No benefits tracking beyond the PIR (when completed); One-off process; Lack of accountability; Limited company-level performance measures

4.3.14 Company F14

Company F14 is a regionally based not-for-profit health insurance company with annual revenue of about $A600m.

Overall, satisfaction with processes is medium to low but confidence is high. The high confidence of the manager PMO was based on anecdotal evidence about the effective management of IT and strong overall business performance. The main evaluation challenge for company F14 was having a common basis on which to compare projects. The key improvements identified were to develop business processes that are applied consistently across the company, the inclusion of all company costs within projects not just IT costs, and the stronger alignment of funding requests to business strategy.

Projects are defined as work >$A20k and are identified by senior business managers. Previously there was a ‘one size fits all’ approach to project governance that led to excessive

rigour and wasted resources. However, the company is currently developing new categories for project governance. All business projects requiring IT input are approved by an ITSC based on a standard business case. Business cases are not independently verified and there is limited analysis. For example, a funding request may identify a benefit as 'a big improvement in revenue' and this is open to interpretation. There are a large number of legislated projects and work on benefits is generally seen as wasted effort. A business case is completed for mandatory projects but it is 'rubber stamped' by the ITSC. For this reason, discretionary work is often combined with mandatory projects in order to get approval. Potentially the wrong projects may be approved; however, this is difficult to know, as there is no benefits review after a project. There is also no accountability to reduce budgets based on expected benefits.

Overall, there is good visibility of all IT projects in the portfolio. The ITSC uses four levels of priority to schedule work: (1) priority one (mandatory), (2) priority two (business imperative with no alternative), (3) priority three (business imperative with alternative), and (4) priority four (desirable). A formal priority setting model is not used because the managing director does not wish to be 'hampered' by a scoring system. Project success is defined with the sponsor at the start of a project based on the relative importance of schedule, budget and quality (the concept of project *sliders*). This helps to drive the project and give context to decisions. A benefits plan should also be developed but in practice, this rarely happens. After the warranty period, a project closure report is completed (four weeks after implementation). The report focuses on project management, sponsor satisfaction (via a survey) and lessons learned (via a workshop). Although the results are shared, lessons do not appear to be learned or processes improved. The culture is conservative and there is inertia in the company. This is reinforced by the managing director who micro-manages all decision making.

The use and effectiveness of IT project evaluation in company F14 is summarised in Table 4.15.

Table 4.15: Summary of evaluation practices for company F14

Profile	Company	F14
	Size (Annual Revenue)	≥ $A0.5≤ $A2b
	Focus of Operations	AU State
	Primary Ownership	AU Private
Ratings	Satisfaction (Approach)	3
	Satisfaction (Deployment)	3
	Satisfaction (Results)	2
	Satisfaction (Improvement)	2
	Confidence	High
Practices	Identification/Selection	Driven from the business; Unclear linkages from business planning to project identification; Risk of selecting the wrong projects
	Priority Setting	Priority setting by ITSC (projects >$A20k); No formal criteria or weightings; Whole of portfolio view; Closely controlled by managing director
	Project Approval	Governance not scaled (intent to scale); Funding for scoping studies; Simple; Process manipulation; No independent verification of business case; Limited analysis; Benefits not accurately identified; Acceptance of intangibles
	PIR/Closure	Formal project closure; Closure conducted one month after implementation; Lessons learned workshop; Sponsor satisfaction review; Success is formally defined by project sliders; Limited use of results (lessons not learned)
	Benefits Realisation	No benefits realisation process; Benefits not measured; Lack of accountability; Limited company measurement

4.3.15 Company F15

Company F15 is a state-based credit union providing banking, loans and insurance to members. Annual revenue is about $A60m.

Overall, confidence that IT projects are delivering benefits to the company is medium. This is because there is not a consistent process to track and measure benefits. The main evaluation challenge identified was how to set priorities and allocate scarce resources. The key improvements identified were implementing structured benefits realisation planning and systems to track the success of IT projects, developing a consistent understanding of evaluation processes across the company, and establishing a PMO to improve alignment of projects with strategy.

IT projects are derived from the company strategic plan and IT plan. These plans are reviewed every 12 months and have a three-year time horizon. The process is flexible and allows for both a planned element and new ideas generated outside of the planning cycle. All projects follow four phases: (1) initiation, (2) feasibility, (3) delivery, and (4) closure and evaluation.

Delegations for approval vary by the value of the project. Business cases are comprehensive and include the identification of benefits within a balanced scorecard framework.

The company uses a formal model with nine weighted criteria to rate and rank projects. This model has only recently been developed and the intent is to change weightings annually to reflect strategic priorities. Before the model was introduced, the company tried to complete too many projects at once. While the model has improved the discipline of priority setting, the process can still be manipulated by changing the weightings in the model. In addition, not every project is captured and prioritised using this system. Currently, some departments are running their own projects that do not follow these processes and are not centrally reported. The company is establishing a PMO to improve visibility and management of all projects across the company.

After delivery, a closure report is completed by the project manager, which covers project management effectiveness and lessons learned. There is also a section for identifying benefits and the timeframe in which they should be achieved. A PIR is then conducted to determine if the planned benefits have been achieved. The PIR is three to six months after closure and is completed by the project sponsor. However, the PIR is a one-off process and there is no tracking of benefits beyond this point. Accountability is achieved from project results being fed into department reports and managers' performance appraisals. There is therefore a vested interest in reporting that a project is a success. Budgets are not impacted by any benefits claimed.

The use and effectiveness of IT project evaluation in company F15 is summarised in Table 4.16.

Table 4.16: Summary of evaluation practices for company F15

Profile	Company	F15
	Size (Annual Revenue)	<$A500m
	Focus of Operations	AU State
	Primary Ownership	AU Private
Ratings	Satisfaction (Approach)	4
	Satisfaction (Deployment)	5
	Satisfaction (Results)	3
	Satisfaction (Improvement)	3
	Confidence	Medium
Practices	Identification/Selection	Annual strategic review; 3-year strategic plan (business and IT); Driven from the business; Flexible
	Priority Setting	Priority setting by senior executive group; Priority setting using weighted criteria; Weightings can be manipulated; Lack of visibility of all projects
	Project Approval	Formal project governance; Governance not scaled; All projects follow four phases; Comprehensive business case; Simple approval process; Acceptance of intangibles (using balanced scorecard); Inconsistent application of processes
	PIR/Closure	Formal project closure and PIR (benefits realisation); PIR conducted three to six months after closure; Coordinated by Business Solutions; Results used to improve processes; Lessons learned not widely shared
	Benefits Realisation	No benefits tracking beyond the PIR; One-off process; Conducted by project sponsor (not independent); Subjective; Benefits claimed not linked to budgets; Company measurement system (using balanced scorecard)

4.3.16 Company F16

Company F16 is a small (annual revenue<A$40m) state-based credit union providing a full range of banking services plus general and life insurance.

Overall, satisfaction with processes is medium to low, but confidence is high. The high level of confidence of the CIO was due to the significant amount of effort put into business cases, the emphasis on risk management, and a range of indicators suggesting company capability is improving in large part due to the IT systems and methodologies used. The main evaluation challenges identified were the engagement of sponsors, and having the knowledge and skills to conduct effective evaluations. The key improvement identified was the implementation of a benefits realisation process.

All projects in the company follow a standardised process, including compliance projects. This is partly to do with the small size of the company but also the view that IT projects are not different to other projects, except that they have an IT component. The process of

identifying opportunities is based on dialogue and a strong IT-business relationship. Starting with a long 'wish list' of ideas, the executive selects and prioritises projects based on a round table discussion. The main criterion for selection is the link to strategic objectives. Once a project is selected, a project brief is completed. This is a 10-page document covering the high-level requirements, business case and project plan. The process is timely and efficient but can be subject to individual influence.

For each project, the management team or steering committee ranks the five most important sliders for a project from the following list: on time, on budget, value added, achieving its objectives and quality of delivery. They are called sliders because the project is tracked by these and as the project progresses they may be adjusted. They also indicate what 'levers need to be pulled' and when a project should be stopped. At the completion of a project, a PIR is conducted. However, a PIR is not always completed and there is no benefits realisation process. Due to limited resources, the project team moves off the project and the evaluation of results is not resourced. There is no follow-up of managers or expectation that they will be held accountable for the delivery of benefits. The use and effectiveness of IT project evaluation in company F16 is summarised in Table 4.17.

Table 4.17: Summary of evaluation practices for company F16

Profile	Company	F16
	Size (Annual Revenue)	<$A500m
	Focus of Operations	AU State
	Primary Ownership	AU Private
Ratings	Satisfaction (Approach)	3
	Satisfaction (Deployment)	3
	Satisfaction (Results)	2
	Satisfaction (Improvement)	2
	Confidence	High
Practices	Identification/Selection	Bi-annual strategic review; 5-year strategic plan; Strong IT-business relationship; Strong alignment to strategy
	Priority Setting	Priority setting by executive; Whole of portfolio view; No formal criteria or weightings; Lacks formality; Subjective; Political influence
	Project Approval	Governance not scaled; Simple approval process; Efficient; Benefits overstated; Resources allocated to governance structures; Effective governance of projects
	PIR/Closure	PIR informal and not applied consistently; Success is formally defined by project sliders; High willingness to stop projects; No dedicated resources
	Benefits Realisation	Benefits identified in business case; No benefits realisation process; Benefits not measured; Lack of accountability; Intent to formalise benefits realisation

4.3.17 Company F17

Company F17 is a publically owned investment management company specialising in the Australian agriculture sector. Annual revenue is about $A400m.

Overall, the confidence rating of the CIO was high. This was based on the justification process and positive informal feedback at the completion of IT projects. The main evaluation challenges were achieving agreement on priorities, managing business expectations and constantly changing business requirements. The key improvement identified was to focus on *ex-post* evaluation processes, namely, closure, PIR and benefits realisation.

The IT department of company F17 was described by the CIO as 'immature'. Project governance structures and processes had only been developed within the last 12 months and were yet to be tested. A project was defined as greater than $A50k, greater than three weeks effort or of strategic importance.

Project opportunities were recently identified using a strategic review process. What came out of this review was a large number of opportunities that were prioritised based on four benefits (return on investment, benefits to advisor network, benefits to end customers and compliance risk) and two risks (barriers to change and implementation risk). Each project was rated from zero to five on benefits and risk, and plotted on a 2x2 matrix. A set of projects was then proposed to the executive. Considering capacity and dependencies, an annual plan was developed with a three-year forward view. A budget was then approved, including funding to scope the approved projects in more detail. The approval process has executive level involvement and buy-in, and decisions are made by the executives not by IT.

The process is not too prescriptive and allows projects to get done. There is a framework and people are trusted to make the right decisions. In general, only a few projects are run at a time so it is relatively easy to keep track of them. Nevertheless, there is the intent to formalise project governance and form an ITSC consisting of the CIO and four executives. There is no closure, PIR or benefits realisation processes although the intent is to also formalise these in the future. In particular, implementing a benefits realisation process is seen as an important future step to help make better investment decisions, drive the realisation of benefits and ensure that funds are being spent appropriately.

The use and effectiveness of IT project evaluation in company F17 is summarised in Table 4.18.

Table 4.18: Summary of evaluation practices for company F17

Profile	Company	F17
	Size (Annual Revenue)	<$A500m
	Focus of Operations	AU National
	Primary Ownership	AU Public
Ratings	Satisfaction (Approach)	4
	Satisfaction (Deployment)	3
	Satisfaction (Results)	2
	Satisfaction (Improvement)	4
	Confidence	High
Practices	Identification/Selection	Annual strategic review; 3-year horizon; Alignment to strategy; Broad consultation; Business engagement
	Priority Setting	Priority setting by executive; Priority setting using formal criteria (benefits and risk); No process to stop projects; Intent to setup ITSC
	Project Approval	Governance not scaled; Single funding approval; Funding for pilot and scoping studies; Top-leadership commitment; Simple; Accurate; Acceptance of intangibles; Intent to formalise project governance
	PIR/Closure	No closure or PIR process; No lessons learned process; Intent to formalise closure and PIR
	Benefits Realisation	No benefits realisation process; Benefits not measured; Success is not formally defined; Intent to formalise benefits realisation

4.3.18 Company F18

Company F18 is a co-operative buying group operating in the Australian automotive industry. Annual revenue is about $A600m.

Overall, the confidence rating of the CIO was high based on observed improvements in performance, information for decision making, and governance processes. However, this rating was not based on a rigorous benefits review process. The major challenges faced when evaluating IT projects were the estimation of duration, cost and resources (since no two projects are the same) and resource constraints. The main improvement identified was the consistent application of new processes throughout the company.

There are standard processes for all corporate projects. A corporate project has one or more of the following characteristics: total costs are likely to exceed $A50k, human resource investment is estimated to exceed 20 person days, or the project risk assessment is high. These processes have recently been designed and are now being implemented. The

establishment of a PMO has also been approved and resources committed to develop project management expertise in the company. If a project is within a business unit and does not exceed the parameters of cost, resources or risk then managers are not compelled to use corporate processes.

The process for identifying opportunities is not formal; however, strategic alignment is always the starting point. All projects must deliver business benefits and be linked to the company strategic plan. All corporate projects require a business case (two to three pages) and must demonstrate their contribution to the perspectives of the company balanced scorecard (finance, customers, internal processes, or learning and growth). All projects are approved, prioritised and reviewed by an executive committee, the project governance board. The ongoing balancing of the project portfolio considers objective evaluation criteria based on the combination of business value, financial measures and the risk involved within each project. These evaluation criteria help shape the overall value and risk level of the project portfolio. The formal scoring system is balanced with the judgements of the project governance board. There is a high willingness to stop projects if strategic priorities change and the project portfolio is regularly reviewed.

There is single project closure report completed by the project manager to wrap-up a project. This covers technical, project management and benefits issues. The report is usually completed within one month of the completion of a project and the project manager is then focused on getting on with the next project. The results are not used but there is a plan for the PMO to capture lessons and use them more effectively in the future. By doing benefits realisation at this stage of the project (close-out) there is not a good picture of whether benefits have been realised. Results are not linked to budgets; however, the current focus is on growing the business (revenue) rather than cost reduction. There is the intent to implement a more rigorous benefits review process.

The use and effectiveness of IT project evaluation in company F18 is summarised in Table 4.19.

Table 4.19: Summary of evaluation practices for company F18

Profile	Company	F18
	Size (Annual Revenue)	≥ $A0.5≤ $A2b
	Focus of Operations	AU National
	Primary Ownership	AU Private
Ratings	Satisfaction (Approach)	4
	Satisfaction (Deployment)	3
	Satisfaction (Results)	3
	Satisfaction (Improvement)	4
	Confidence	High
Practices	Identification/Selection	Annual strategic plan; Central repository of ideas; Strong alignment to strategy; Identification of opportunities lacks formality; Intent to setup PMO
	Priority Setting	Priority setting by project governance board; Priority setting using weighted criteria (business value, cost and risk); Rigorous; Accurate; High willingness to stop projects
	Project Approval	Governance scaled to multiple criteria; Top-leadership commitment; Single point of funding control; Single funding approval; Simple (one-step); Use of pilot studies
	PIR/Closure	Formal project closure; Completed one month after implementation; Lacks rigour; Lessons learned not used
	Benefits Realisation	No benefits tracking beyond project closure; One-off process; Baseline measurement of benefits; Inconsistent application; Intent to formalise benefits realisation; Company measurement system (using balanced scorecard)

4.3.19 Company F19

Company F19 is a small privately owned wealth management advisory company with state-based operations and annual revenue less than $A30m.

Overall, the confidence of the IT manager that IT projects are delivering benefits to the company was medium. Previously the company had no formal evaluation processes, projects were done on an *ad hoc* basis for people who 'shouted loudest', and there was a lot of wasted effort. However, the company recently introduced a formal project management framework. The framework applies to all projects, including IT infrastructure projects. The main evaluation challenge for company F19 is establishing clarity around business requirements. The key improvement identified was embedding the implementation of the project management framework.

The project management framework is simple and flexible to match the dynamic nature of the company. An idea always starts with a discussion between IT and the business, and not with a form.

Ideas are generated by business solutions analysts working with the business, and strategic opportunities derived from the company strategic plan or department business plans. Occasionally a company survey may also be conducted to identify opportunities. Priorities are set by department managers and an executive committee, which provides project guidance as required. However, there is no formal rating system and there are generally sufficient resources for all projects that are proposed.

Governance of projects is scaled to the value of the project and if CAPEX is greater than $A150k a formal paper goes to the board. Projects in the company are generally less than three months in duration and if they are longer, they are broken down into stages. There are a number of decision points in the project management process, which allow projects to be controlled and stopped if required. The requirements of the project management framework are not prescriptive and there is flexibility to modify the process for each individual project. For example, if a business manager has sufficient information to accept a project based on the project proposal form then the requirement to prepare a business case can be skipped. Only the information that is required to help make a decision is required. There are no investment hurdle rates and each idea is considered on a case-by-case basis. This balance between agility and formality also means that strong individuals can influence decision making.

As part of the project management framework, a PIR is conducted three to six months after the solution is implemented. The expected benefits and a few key measures of success for a project are always defined at the start of a project. The purpose of the PIR is to determine the extent to which the project met objectives and delivered the planned level of benefits, to identify further improvements to optimise the benefits delivered, and to learn lessons to improve future projects. However, since the process was only recently introduced, a PIR is yet to be completed. Accountability in the company is driven through reputation and this is expected to be reinforced by the implementation of the PIR process. Given the small size of the company, benefits are not overstated, as this would quickly affect an individual's credibility.

The use and effectiveness of IT project evaluation in company F19 is summarised in Table 4.20.

Table 4.20: Summary of evaluation practices for company F19

Profile	Company	F19
	Size (Annual Revenue)	<$A500m
	Focus of Operations	AU State
	Primary Ownership	AU Private
Ratings	Satisfaction (Approach)	5
	Satisfaction (Deployment)	4
	Satisfaction (Results)	3
	Satisfaction (Improvement)	3
	Confidence	Medium
Practices	Identification/Selection	Comprehensive; Strategic plan; Department business plans; Strong IT-business relationship; Business engagement; Responsive; Lots of good ideas
	Priority Setting	Priority setting within each business unit; No formal criteria or weightings; Limited competition for resources; Political influence
	Project Approval	Governance scaled to project value; Simple; Flexible; Timely decision making; Single funding approval; Stage gates; Approval of the right projects
	PIR/Closure	Formal PIR (benefits realisation); PIR conducted three to six months after implementation; Lessons learned shared in IT (but not across the company)
	Benefits Realisation	No benefits tracking beyond the PIR; One-off process; Company measurement system; Accountability (by reputation)

4.3.20 Company F20

Company F20 is a state government owned not-for-profit that manages superannuation investments for its members. Annual revenue is less than $A500m.

Overall, the confidence level of the general manager administration and technology was medium. The initiation of projects can be improved with better planning, consultation and visibility. The major evaluation challenges identified were competing business priorities, changing business requirements, and the tension between long-term planning requirements and the fluidity of projects. The key improvements identified were consistent application of processes, better understanding of roles and responsibilities, central budget control, visibility across the whole project portfolio and greater flexibility.

Responsibility for identifying opportunities is shared by the business units and technology group. A series of annual strategy sessions between the executive group and management set the strategic direction of the company over three planning horizons. The executive group is responsible for prioritisation and approval of major projects. The executive sponsor is responsible for minor projects. A minor project is greater than $A20k and less than $A100k,

over two weeks work, single or cross-divisional, medium complexity and up to 10 stakeholders. A major project is over $A100k, company-wide scope, medium to high complexity and a large number of stakeholders.

All projects go through evaluation stage gates and require approval to proceed to the next stage. These stages are: (1) envision (preliminary concept), (2) initiation (approval of concept), (3) design (approval in principle) and (4) planning (authority to proceed). The stage gates allow close control of projects, and the progressive refinement of requirements and estimates. Once an idea is identified, a concept form is completed that has four worksheets: a concept overview, a financial value tool, a risk assessment tool and a strategic alignment tool. This information is used to prioritise projects. The process for completing the concept form and subsequent business case is rigorous. Estimates are independently verified and there are dedicated resources in project central and finance to support this process. However, there is a tendency to try to make business cases perfect at the start and the process lacks flexibility. Thus, the process is viewed as bureaucratic and is not always followed.

At the completion of a project, the project manager completes a report about what has been delivered, what is outstanding and lessons learned. However, the project closure report is viewed as a 'box-ticking' exercise and the results are not used. About three months after implementation, an independent end of project review is also conducted. The review focuses on scope management, financial management, quality and lessons learned. Project central manages the actions from these reviews; however, the outcomes are not always followed up.

Benefit owners and the executive sponsor are responsible for benefits realisation. A benefits delivery plan is prepared for each project at the business case stage and redefined at project statement. Benefits are classified as either 'member retention and growth', 'cost management', 'compliance/risk management' or 'business efficiency'. There is a continuous focus on benefits with reviews at each stage gate, closure and post-implementation. Benefits are owned by branch managers and tracked monthly by project central. Revenue targets are tracked separately and reported to the executive group. The tracking of benefits ends when they are delivered; although this process could be improved. Benefits claimed are always tied to budgets.

The use and effectiveness of IT project evaluation in company F20 is summarised in Table 4.21.

Table 4.21: Summary of evaluation practices for company F20

Profile	Company	F20
	Size (Annual Revenue)	<$A500m
	Focus of Operations	AU State
	Primary Ownership	Government
Ratings	Satisfaction (Approach)	4
	Satisfaction (Deployment)	3
	Satisfaction (Results)	2
	Satisfaction (Improvement)	2
	Confidence	Medium
Practices	Identification/Selection	Comprehensive; Five-year strategic plan (three time horizons); Strong alignment to strategy; Annual review aligned to budget cycle; Lacks flexibility
	Priority Setting	Priority setting by executive group (for major projects); Priority setting using weighted criteria (financial value, risk, strategic alignment); Rigorous
	Project Approval	Governance scaled to multiple criteria; Stage gates; Rigorous; Independent verification of estimates (dedicated resources); Bureaucratic; Inconsistent application of processes
	PIR/Closure	Formal closure; Independent PIR ('end of project review'); Inconsistent application of processes; Lessons learned not used
	Benefits Realisation	Benefits delivery plan; Continuous focus on benefits; Benefits tracked until realised; Coordinated by project central; Accountability for results (via business ownership and budgets); Not applied consistently

4.4 Description of Cases: Mining

4.4.1 Company M1

Company M1 is a large oil and gas, exploration and production, company listed on the Australian Stock Exchange. Annual revenue is about $A2.5b.

Overall, confidence that IT projects are delivering benefits to the company is medium. There are still projects that are 'someone's baby' and a fair bit of politics involved in decision making. The evaluation challenges for company M1 are focusing on project justification (with the start of some genuine competition for funds), implementing a PIR process and implementing a more rigorous approval process. The improvements identified were clarification of evaluation roles, clearly defined responsibilities, and education of the business to understand and follow evaluation processes.

There are documented procedures for approving all IT projects with a value greater than $A20k. There is an annual allocation of the capital budget to IT and an IT governance

committee that dispenses the funds. There are two sub-committees that support the IT governance committee and evaluate the technical aspects of projects. The budget is put together in September of the previous year and potential projects are solicited from the business through the CIO office. A bid for funds is submitted to the board 'which is then typically halved'. The IT governance committee then decides how to allocate those funds. However, the IT governance committee tends to be caught up in technical issues rather than questions of value. In addition, the IT department is often bypassed and a solution is identified before IT even hears about the project.

There are two stages of approval: (1) a one page business request that outlines the business problem, one or two solutions and a rough cost, and (2) a more detailed business case that outline the process, costs, risks and potential benefits. As there is very little competition for funds, business requests and business cases lack rigour and most requests are approved if they are 'half decent'. There is also a lack of business focus on IT since the $A25m IT budget is small compared to the overall company budget. This also means that there has been no need to set priorities. The requirement for a business case is at the discretion of the IT governance committee, and generally if a project is less than $A50k a business case is not required. However, the processes are applied inconsistently and often projects greater than $A50k are approved without a business case.

A project closure report is completed for all projects and summarises deliverables, budget and schedule performance, an overall success score and lessons learned. Success is formally defined and judged against seven criteria. These are given relative importance ratings at the start of a project by the project sponsor (documented in the project charter). A success is defined as a project with an overall score of greater than 70 per cent. There is no PIR or benefits realisation process, and no accountability for results. Projects tend to be done one after the other and 'people do not look back'.

The use and effectiveness of IT project evaluation in company M1 is summarised in Table 4.22.

Table 4.22: Summary of evaluation practices for company M1

Profile	Company	M1
	Size (Annual Revenue)	>$A2b
	Focus of Operations	International
	Primary Ownership	AU Public
Ratings	Satisfaction (Approach)	4
	Satisfaction (Deployment)	3
	Satisfaction (Results)	2
	Satisfaction (Improvement)	4
	Confidence	Medium
Practices	Identification/Selection	Alignment with IT and business strategies; Lacks rigour; Bypassing of IT; Political behaviour
	Priority Setting	No formal priority setting; Whole of portfolio view; Limited competition for funds
	Project Approval	Governance scaled to project value (two tiers); Justification lacks rigour; Manipulation of processes; Inconsistent application of processes; Intent to implement stage gates (for projects >$A1m)
	PIR/Closure	Formal project closure; Completed within two months after implementation; Consistently applied; Completed by project manager (with the project team); Success is formally defined by project sliders; Lessons learned not used
	Benefits Realisation	No benefits realisation process; Benefits not measured; Lack of accountability

4.4.2 Company M2

Company M2 is a start-up iron ore mining company with state-focused operations. In 1996, the company had raised billions of dollars in debt and equity to bring its mining project into operations. Revenue was less than $A500m.

Overall, both satisfaction with processes and confidence is low. The focus of the company is the rapid start-up of mining projects and there are no formal procedures for evaluating IT projects. All IT projects are centred on the mining projects of the company. The company outsources all of its IT services and relies on external expertise to advise what systems are required. The main evaluation challenge for company M2 was engaging the business to define requirements, particularly since many company positions are yet to be filled. The key improvements identified were understanding business requirements sooner, clarifying roles and responsibilities, documenting procedures, and better analysis and planning.

The priority of IT projects follows operational needs. For example, at the moment, the company needs systems to support the finance and maintenance of mining construction. Some of the systems being implemented are maintenance information management systems

(MIMS), ERP and health, safety and environmental systems (HSES). The company uses a 'stage gate type' process. Success is about getting the systems implemented and delivered on time.

There are no standard documented procedures and no formal business cases. The process is *ad hoc* and generally involves selecting a few alternatives, inviting vendors to state their capabilities, and presenting a PowerPoint to the executive team for a decision. The vendors often do the documentation and write the requirements. A capital expenditure request (CER) is completed for funding and the budget is released in stages. However, individuals are able to influence decisions due to the segmentation of departments and projects 'run under the radar'. This sometimes results in the wrong systems being implemented. For example, IT was bypassed and an individual made a decision to implement a standard private automatic branch exchange (PABX) system in a Port when the requirement could have been met with VoIP.

The company does not want to build an IT department and deliberately outsources all IT projects to be mobile and agile. The CEO of company M2 is of the opinion that technology will change rapidly over the next five years and does not want to be constrained by any technology that cannot be swapped quickly. Projects have only ever been stopped by the CEO.

The use and effectiveness of IT project evaluation in company M2 is summarised in Table 4.23.

Table 4.23: Summary of evaluation practices for company M2

Profile	Company	M2
	Size (Annual Revenue)	<$A500m
	Focus of Operations	AU State
	Primary Ownership	AU Public
Ratings	Satisfaction (Approach)	2
	Satisfaction (Deployment)	2
	Satisfaction (Results)	3
	Satisfaction (Improvement)	3
	Confidence	Low
Practices	Identification/Selection	Requirements driven from mining operations; Reliance on external expertise; Political behaviour; Bypassing of IT; Selection of the wrong projects
	Priority Setting	Priorities follow operational needs; No formal priority setting; No portfolio view
	Project Approval	No formal procedures; Stage gate type process; *Ad hoc*; Robust discussions; Responsive to dynamic environment; Lack of project governance
	PIR/Closure	No closure or PIR process; No lessons learned process; Intent to formalise PIR process
	Benefits Realisation	No benefits realisation process; Benefits not measured; Lack of accountability

4.4.3 Company M3

Company M3 is a leading international gold mining company. Annual revenue is about $A700m for the Australian and Pacific operations of the company.

Overall, confidence that IT projects are delivering benefits is medium. The challenge for IT projects is that the scale of funding is trivial compared to the overall company budget and IT is viewed as a 'back-room' function. Therefore, it is not high on the management 'radar' to worry about IT projects. The main evaluation challenges for company M3 were getting the business involved in IT projects and coordination of the IT portfolio. The key improvements identified were ensuring projects were aligned to business plans and measuring whether expected benefits are met.

The IT department delivers a small number of projects driven, where possible, by business needs. Although the company has grown rapidly over the last decade, it is still agile and decision making is rapid. The Project Delivery Methodology (PDM) outlines procedures for evaluating and managing projects, supported by a comprehensive set of templates. Processes are scaled for small, medium and large projects based on classification of resources, cost and risk. For example, a large project is greater than three months effort, greater than $US250k

and high risk. However, while processes are documented they are not strongly enforced and not always applied consistently.

Strategy is set globally and delivered regionally. However, there is no documented strategic plan against which IT projects are aligned. There are three main ways in which opportunities are identified: (1) technology solutions driven through the IT group, (2) the continuous improvement group, and (3) change requests from users in the business. The preference is to have the business driving technology but currently projects are driven from the IT group. Priorities are determined informally by regional management teams and specific evaluation criteria are not used.

A project starts with a project initiation request and then a business case. Projects only go to the business case stage if there is availability of resources to start the project. Any expenditure >$US50k also requires an Application for Expenditure (AFE), which is the same process as 'buying a truck'. Small projects are covered by a single expenditure request. However, larger projects are generally funded in two stages, scoping and project delivery. This allows a more detailed plan and accurate costing to be produced. To control IT projects in the business and ensure alignment with global strategies, all IT projects are approved centrally by the international head office.

There is a formal project closure process that focuses on the achievement of project deliverables. A PIR is also meant to be completed three to six months later. However, there is no ownership or tracking of PIRs and they are not done. Thus, there is no assessment to determine if the business case and expected benefits are fully met. There is no formal judgement of success and a 'cultural reluctance' to define a project as a failure. Further, projects costs are allocated to an overall cost centre and individual project costs are not tracked. This makes it possible to easily hide over or under expenditure on individual projects. Projects often run over the authorised expenditure amount with no supplementary request for funding and resources are wasted. While the value of a PIR process is recognised by IT and finance, there is a lack of commitment from senior management. Business managers are not accountable either for the overall performance of the business or for individual projects. Thus, there is no motivation for them to evaluate projects *ex-post*.

The use and effectiveness of IT project evaluation in company M3 is summarised in Table 4.24.

Table 4.24: Summary of evaluation practices for company M3

Profile	Company	M3
	Size (Annual Revenue)	≥ $A0.5≤ $A2b
	Focus of Operations	International
	Primary Ownership	International
Ratings	Satisfaction (Approach)	3
	Satisfaction (Deployment)	4
	Satisfaction (Results)	1
	Satisfaction (Improvement)	4
	Confidence	Medium
Practices	Identification/Selection	Driven from the IT Group; Broad consultation; Lack of business ownership; Projects not formally linked to business plans (no documented plan)
	Priority Setting	Priority setting by regional management teams; No formal criteria or weightings; Intent to establish a PMO
	Project Approval	Governance scaled to project value (three tiers); Single funding approval; Funding for scoping studies (large projects); Simple; Quick; Agile; Lacks rigour; Central (global) control of IT projects
	PIR/Closure	Formal project closure and PIR; PIR not applied consistently; Lack of ownership; No formal lessons learned process (lessons shared informally)
	Benefits Realisation	No benefits realisation process; Benefits not measured; Inadequate measurement of costs; Lack of accountability (overall and at project level); Limited company measurement; Wasted resources

4.4.4 Company M4

Company M4 is a leading publically listed Australian gold mining company with annual revenue of about $A1b.

Overall, confidence that IT projects are delivering benefits is low. However, new processes are being implemented and the IT Superintendent expects to be more confident in the future. The main evaluation challenges were engaging the business given low levels of expertise and high turnover, and the time and resources to conduct *ex-post* evaluations. The key improvements identified were ensuring that evaluation was conducted and introducing more rigorous processes that are followed consistently.

There is not a consistent corporate approach to business planning. Planning is very basic and reactionary. Often business departments bypass IT and purchase what systems they want. The IT department is working towards greater visibility of projects and has recently initiated discussions with the business to identify their needs. Priorities are set by the IT department without business owner participation. A company CER is required for any expenditure greater

than $A1. The CER focuses on financial criteria and does not cater for intangibles. In addition, there are IT-specific processes. A small project requires a project brief, and a large project requires a project plan and business case. However, there is no clear definition of a large or small project.

The process of approval lacks rigour and often the process starts with a solution that is then justified rather than starting with a problem or opportunity. While the company is starting to implement a rigorous project management framework, the processes are very immature and are applied inconsistently. There is a single funding approval and projects run until they are completed. The company is focused on delivery and approvals are pushed through quickly. There are no stage gates, no change processes and no approval processes for additional funding. There is also a lack of discipline around stopping projects and many projects 'waffle' along without any clear end point. There is no formal closure, PIR or benefits realisation process. Measurement is limited and the success of a project is based on 'gut feel'. The implementation of a new project management framework is expected to address these issues. A PMO is also being setup to support the processes. The use and effectiveness of IT project evaluation in company M4 is summarised in Table 4.25.

Table 4.25: Summary of evaluation practices for company M4

Profile	Company	M4
	Size (Annual Revenue)	≥ $A0.5≤ $A2b
	Focus of Operations	AU National
	Primary Ownership	AU Public
Ratings	Satisfaction (Approach)	3
	Satisfaction (Deployment)	3
	Satisfaction (Results)	2
	Satisfaction (Improvement)	3
	Confidence	Low
Practices	Identification/Selection	Driven from the IT department; Lacks formality; Bypassing of IT; Inconsistent approach to business planning
	Priority Setting	Priority setting by IT department; Priority setting using formal criteria; Intent to establish a PMO; Working towards greater visibility of IT portfolio
	Project Approval	Governance not clearly scaled; Single funding approval; Lacks rigour; Lacks formality; Introducing formal evaluation procedures
	PIR/Closure	No closure or PIR process; No lessons learned process; Intent to formalise closure and PIR process; Reluctance to stop projects
	Benefits Realisation	No benefits realisation process; Benefits not measured; Lack of accountability

4.4.5 Company M5

Company M5 is a privately owned engineering construction company specialising in international mineral resource projects. Annual revenue is less than $A500m.

Overall, the confidence of the global manager IT services is high. This is based on a personal conservative approach to project approval. The main challenge for company M5 is accurately identifying business requirements. The key improvements identified were ensuring a clear understanding of roles and responsibilities, establishing commitment to evaluation processes and stronger controls to enforce consistent application of processes.

The company has formal processes and a business systems steering committee that govern IT systems. The processes were only recently introduced and historically the company has not invested in project evaluation. However, the company is growing significantly and has recognised the need to implement more formal processes. This has started with approval processes and the intent is to introduce more formal closure and PIR processes. Therefore, the current level of satisfaction with evaluation processes is medium for approach, and low for deployment, results and improvement.

The evaluation process starts with the completion of a project request form. This form is submitted to the ITSC, which consists of key management representatives of the company. Most ideas are driven from the IT department and only three of the eight members of the ITSC actively participate in strategic discussions. The portfolio of projects (about 25 projects) is first prioritised by a business analyst as: ‘extremely high’, ‘high’, ‘medium’, or ‘low’ priority based on major business drivers, risks and benefits. The representatives on the steering committee provide a sanity check of the list and then rank the projects. Projects are then scheduled over a three-year period. Next, a business case is developed that focuses on cost-benefit analysis and payback period. However, the approval process can be bureaucratic. The ITSC does not have the authority to approve projects and they are approved by the executive.

There is a strong focus on strategic alignment. Projects must align to the company’s key results areas: customer service/satisfaction, improve service delivery/business productivity, innovation, revenue growth/cost minimisation, or risk management. Project requests and business cases are generally compiled by the IT department. There is evidence that benefits

are overstated and this is attributed to the lack of accountability. Measurement is limited to project schedule and costs. There is no measurement of benefits and different views about the value of a benefits realisation process.

The use and effectiveness of IT project evaluation in company M5 is summarised in Table 4.26.

Table 4.26: Summary of evaluation practices for company M5

Profile	Company	M5
	Size (Annual Revenue)	<$A500m
	Focus of Operations	International
	Primary Ownership	AU Private
Ratings	Satisfaction (Approach)	3
	Satisfaction (Deployment)	2
	Satisfaction (Results)	1
	Satisfaction (Improvement)	1
	Confidence	High
Practices	Identification/Selection	Driven from IT department; 3-year project horizon; Annual review; Strong alignment to strategy (five key result areas)
	Priority Setting	Priority setting using formal criteria balanced with management judgement; Whole of portfolio view; Ongoing management of project portfolio
	Project Approval	Governance not scaled; Single funding approval; Bureaucratic; Driven from IT department; Comprehensive cost estimates; Benefits overstated
	PIR/Closure	No closure or PIR process; No lessons learned process; Intent to formalise closure and PIR process
	Benefits Realisation	No benefits realisation process; Benefits not measured; Lack of accountability

4.4.6 Company M6

Company M6 is one of Australia's largest diversified resource companies with international operations. The company is publically listed with annual revenue exceeding $A2b.

Satisfaction with the approach and deployment of evaluation processes is high. Confidence that IT projects are delivering benefits is also high based on the rigour of *ex-ante* evaluation. The major evaluation challenge for company M6 was getting the time commitment from the business to engage in IT projects. The key improvements identified were ensuring the consistent application of processes, and educating sponsors on their role and responsibilities.

Although the level of IT expenditure is small compared to the overall company budget, the company is starting to recognise that IT is a high impact area. Business facing projects with an IT component are now being called business projects. There is formal governance for all projects with a value greater than $A100k. Projects with a value less than $A100k are not subject to formal governance unless there are high-risk components.

The engagement process with the business is comprehensive and IT projects are jointly identified. Project ideas are generated via business solution managers engaging the business, IT input to projects, and corporately mandated projects. The process of project identification aligns with annual budget submissions and projects align with business strategic plans. When an opportunity is identified, it is classified and prioritised using a formal 'Motorola' assessment based on business value (financial and non-financial costs and benefits), timeframe to benefits, difficulty/risks, and strategic fit. Each element is rated using an assessment tool with weightings. For example, the strategic fit of projects is rated against 14 weighted business objectives using a scale of none (0), low (1), medium (3) and high (5). The process was recently refined to provide greater granularity and clarity of priorities.

Company M6 uses a stage gate process with five 'toll gates'. The toll gates are concept and initiation (T1), definition and planning (T2), execution (T3), handover and operate (T4) and benefits realisation (T5). Concept and initiation involves the development of a business case, business requirements and a high-level execution plan. The business case includes a benefits realisation plan and results chain (or 'benefits map'). Formal critical success factors and measures of success are also identified. Estimates are progressively refined from +-50 per cent at T1 to +-10 per cent at T2. Assumptions are independently verified by a financial analyst and for this reason, benefits are not overstated. Projects are authorised by departments, the IS project review group or executive leadership team depending on the level of expenditure. However, because budgets are distributed the IT department is not always informed of all IT projects and processes are not applied consistently. The company is moving to a model of centralised funding for IT for greater visibility and control.

At T4, there is a formal PIR followed by project closure. The PIR is independently facilitated and focuses on lessons learned. The lessons learned are used to improve processes and are stored in a searchable lessons learned register. A close-out report is then completed by the project manager sighting the PIR and formally closing out the project. This includes measurement against the critical success factors defined at the start of the project, a

performance assessment against project KPIs, performance against stated benefits, and milestones for benefits achievement. There is a high willingness to stop projects and reallocate resources. The company uses Earned Value Management (EVM) on projects and there are clear points for potentially stopping a project (T1, T2 or T3).

Company M6 has a Benefits Capture System (BCS) for projects with benefits greater than $A50k and/or costs greater than $A500k. The process was recently approved by the executive leadership team. The business sponsor is responsible for benefits realisation and results are independently verified by a business analyst. The IT department will not start a project without a business sponsor and the project entered in the BCS. The business sponsor signs off on benefits claims and budgets may also be adjusted based on these claims. The process is currently being implemented and there is still work to be done to get the business to follow the process consistently. The use and effectiveness of IT project evaluation in company M6 is summarised in Table 4.27.

Table 4.27: Summary of evaluation practices for company M6

Profile	Company	M6
	Size (Annual Revenue)	>$A2b
	Focus of Operations	International
	Primary Ownership	AU Public
Ratings	Satisfaction (Approach)	4
	Satisfaction (Deployment)	4
	Satisfaction (Results)	3
	Satisfaction (Improvement)	3
	Confidence	High
Practices	Identification/Selection	Comprehensive; Strong alignment to strategy; Alignment with budget cycle; Business solutions managers; Business engagement; Success formally defined; Some bypassing of IT
	Priority Setting	Priority setting using weighted criteria (business value, timeframe to benefits, risks and strategic fit); Rigorous; High willingness to stop projects
	Project Approval	Formal governance (projects>$A100k); Stage gates; Rigorous; Progressive refinement of estimates (at gates); Independent verification of estimates; Accurate estimation; Distributed funding control (moving to single point of control); Inconsistent application of processes
	PIR/Closure	Independent PIR; Formal project closure following PIR; Consistently applied; Success formally measured; Lessons learned used
	Benefits Realisation	Scaled benefits realisation process; Benefits realisation plan in business case; Use of results chains; Update of benefits at project closure; Benefits tracked for 3–12 months; Independent verification of results; Inconsistent application of benefits tracking (process recently introduced); Company measurement

4.4.7 Company M7

Company M7 is a publicly listed Australian company focused on the mining and processing of mineral sands. Annual revenue is about $A900m.

The IT project director is highly confident that IT projects are delivering benefits to the company. This is based on the approval of projects by the business owner, project director and general manager. The major challenges faced when evaluating IT projects are the management of business expectations, control of the IT environment, engaging the business in evaluation, and implementing a robust process for measuring benefits. Evaluation processes could be improved by greater business ownership and visibility of the whole investment portfolio.

Projects are categorised as A, B, C or D depending on size, cost, complexity and risk. Most IT projects are C and D projects (the biggest is just over $A1m). Each category of project has a methodology that is mandated and the process has been adapted for IT projects. All projects require a project proposal that focuses on financial estimates and feeds into the budgeting process. Priorities are set by an executive committee based on risk, alignment to objectives, time and cost. However, the time taken to approve annual budgets can delay projects by six to eight weeks. In addition, the company does not have a process to manage ideas outside of the budget cycle and in these cases it is a case of 'who yells loudest'. As a result, these projects are not always aligned to the business strategy.

IT projects follow five stages: (1) assess, (2) select, (3) develop, (4) execute and (5) close-out. The steps in the process are intended to be flexible; however, this is not widely understood. Following initial budget approval, the IT department produces a project charter, which is a scoping document to clarify goals, objectives, scope and deliverables (no financials). A Major Expenditure Proposal (MEP) is also completed that provides the financial approval for the project. There is a single funding approval except for larger projects where funding is split into two stages; the first being for detailed scoping and the second for development, execution and close-out. In theory, the business develops the MEP but in reality, the IT department has to 'drag' the business through the process. In addition, expenditure is sometimes split to avoid formal processes and financial approvals.

During the migration, there is a close-out phase and a formal close-out report is produced by the project manager. The report covers project performance and lessons learned. A formal workshop is also run by the projects director to capture the lessons learned. This information is stored by the PMO and reviewed quarterly with the IT team. There is no benefits realisation process but there is a draft proposal to implement one. The major hurdles are the identification of benefits and then deciding who should be responsible for tracking benefits after project closure. The company is 'not short of money' and business manager do not see the value of a benefits review process. There is currently no ownership and no accountability of results.

The use and effectiveness of IT project evaluation in company M7 is summarised in Table 4.28.

Table 4.28: Summary of evaluation practices for company M7

Profile	Company	M7
	Size (Annual Revenue)	≥ $A0.5≤ $A2b
	Focus of Operations	AU National
	Primary Ownership	AU Public
Ratings	Satisfaction (Approach)	3
	Satisfaction (Deployment)	2
	Satisfaction (Results)	2
	Satisfaction (Improvement)	3
	Confidence	High
Practices	Identification/Selection	Three planning horizons; Alignment to strategy; Alignment to budget; 12-month forward project planning; Delays from budget process
	Priority Setting	Priority setting by executive management committee; Priority setting using formal criteria; Lack of visibility of all projects; Political behaviour (for out-of-cycle projects)
	Project Approval	Governance scaled to multiple criteria (four categories); Stage gates; Rigorous; Single funding approval; Funding for scoping studies; Driven by IT department; Flexibility (but not widely understood); Some process avoidance
	PIR/Closure	Formal project closure; Comprehensive; Delays in completing project closure; Informal PIR (by projects director); Use of lessons learned
	Benefits Realisation	No benefits realisation process; Benefits not measured; Lack of accountability; Intent to formalise benefits realisation

4.4.8 Company M8

Company M8 is a leading international mining company that mines and processes a range of mineral resources. The company is listed on the Australian Stock Exchange with annual revenue exceeding $A2b.

Overall, the CIO had a medium level of confidence that IT projects are delivering benefits to the company. This had to do with the visibility of the project outcomes. For some projects, the benefits were obvious but for others it was difficult to determine if the projects 'made a difference'. The major evaluation challenges for company M8 were the measurement of intangibles, getting the business to appreciate the value of IT, justifying expenditure on IT infrastructure, and shifting the focus from cost to value. The main improvement identified was simplifying company processes to remove 'bottlenecks'.

Formal evaluation processes for IT projects were developed a year ago based on a 'Prince2' project methodology. There are multiple sources for opportunities: information systems and technology (IS&T), the business and corporate. All ideas go through two full-time IS&T demand coordinators who evaluate the ideas and share them across business units. There is an IS&T strategy linked to the business strategy, and each idea is assessed for alignment. The consultation process results in the selection of projects that are based on business needs. At any one time, the company has about 600 ideas and about 60–70 live projects. Priority setting is qualitative based on business needs.

The approval process used is the same for any capital investment, including infrastructure projects. Projects are categorised as A, B or C based on size (budget, resources and schedule) and manageability (business impact, technology, complexity, dependencies and deadlines). The level of detail and robustness of the evaluation processes varies by project category. The business case is independently verified by the IS&T team and by an internal business analysis team. While the project management methodology follows distinct stages, there is a single funding approval. For example, funding for a document management system was approved in one allocation of $A3.5m and the project manager were then responsible for delivery. There is tight control of corporate funds but sometimes operating funds are used by the business to purchase IT systems. Also, the approval process can be slow with company 'bottlenecks'.

A simple project closure report is completed by the project team following implementation. It covers issues, next steps and lessons learned. However, the process lacks rigour due to time constraints and there is no follow-up from the report. A peer review PIR is also completed about three months after project completion; however, the decision to apply a PIR is subjective. The results of the PIR are sent to the project board, formal responses to actions are required and the actions are followed up.

Measures of success are formally defined in the business case and 'handed over' from IS&T demand to IS&T delivery. However, there is no formal benefits realisation process. The follow-up and measurement of benefits is dependent on the size of the project, and the project manager and business representative involved. Generally, success is judged by informal feedback.

The use and effectiveness of IT project evaluation in company M8 is summarised in Table 4.29.

Table 4.29: Summary of evaluation practices for company M8

Profile	Company	M8
	Size (Annual Revenue)	>$A2b
	Focus of Operations	International
	Primary Ownership	AU Public
Ratings	Satisfaction (Approach)	4
	Satisfaction (Deployment)	3
	Satisfaction (Results)	2
	Satisfaction (Improvement)	2
	Confidence	Medium
Practices	Identification/Selection	IS&T strategy linked to business strategy; IS&T Demand Coordinators; Alignment to strategy; Broad consultation; Selection of the right projects; IT-business relationship issues
	Priority Setting	Priority setting within each business unit; No formal criteria or weightings; Qualitative; Process can be improved
	Project Approval	Governance scaled to multiple criteria (three categories); Rigorous; Use of pilot studies; Independent verification of estimates; Bureaucratic (company 'bottlenecks'); Single funding approval; Some bypassing of IT
	PIR/Closure	Formal project closure and PIR; Simple closure process; Closure completed by project team; Independent PIR conducted three months after closure; PIR is not mandated; Limited use of results
	Benefits Realisation	No benefits realisation process; Benefits not tracked; No intent to formalise benefits realisation

4.4.9 Company M9

Company M9 is one of Australia's largest publicly listed oil and gas exploration companies. The company has international operations with annual revenue greater than $A2b.

Satisfaction with the approach and deployment of evaluation processes, and overall confidence is medium. Not all IT projects deliver benefits because project planning and scoping is not always rigorous, and benefits are not clearly identified and measured. The evaluation challenges for company M9 were the measurement of intangibles, inaccurate estimation, unclear benefits, business engagement and clarity of business expectations. These were related to the complexity of IT projects, the intangible nature of IT benefits, and a rapidly changing environment. The key improvements identified were reducing duplication between projects, more consistent and rigorous application of processes, raising awareness of processes and improving overall project governance.

There is a lack of business focus on IT. The $A30m IT budget is small compared to the billions spent by the company and IT is viewed as 'a commodity'. There is no ITSC or other governance structures. A steering committee did exist but managers would not turn up and the committee became ineffective. There are no consistent, controlled, uniform procedures and no centralised IT governance. However, significant projects (>$A1m) compete for capital and follow standardised company evaluation processes.

IT budgets are distributed and not all IT projects are evaluated. IT operates in an outsourced environment with a core IT management group and an outsourced delivery mechanism. Priority setting occurs within departments, except for enterprise-wide projects, which are prioritised by the IT department. There is a tension between 'process parochialism' and 'IT centricity'. This often results in the business buying proposed solutions that do not meet corporate requirements or corporate IT infrastructure and IT approaches unrelated to business needs, respectively.

Project sponsors can initiate a project without any formal documentation and processes are often manipulated. For example, safety and asset integrity are often used to justify projects. Approval has a great deal to do with informal influence and if someone has a 'pet project' then it will get done. There is a lack of visibility of all projects in the company resulting in

wasted resources. There may be overlaps with the same problems solved in different parts of the company or projects that are at odds with each other.

IT projects normally start with an Initiative Profile. A more detailed project statement may then be developed, although there are variations in how this is done. The company is action-orientated and 'if it cannot be fit on a page it will not be read'. Time is not wasted on paperwork and the focus is on delivery. However, this often means that there is a lack of rigour when justifying projects, estimates are inaccurate, benefits are overstated and it is unclear why some projects are initiated.

At project closure, a project completion report is completed by the project manager. It compares the achievement of project objectives, success criteria, budget and schedule against what was defined in the project statement. Project and process improvement opportunities are also identified. Lessons learned are managed by the PMO. However, there is a lack of interest in closure reports and they are not completed consistently. In addition, project managers are contractors and generally, lessons learned are not re-used.

The company works in a rapidly changing environment and the baseline from justification to delivery is very different. While a benefits delivery plan may sometimes be completed to help get approval there is no follow-up. For very significant projects, benefits may be tracked but this is not the norm.

The use and effectiveness of IT project evaluation in company M9 is summarised in Table 4.30.

Table 4.30: Summary of evaluation practices for company M9

Profile	Company	M9
	Size (Annual Revenue)	>$A2b
	Focus of Operations	International
	Primary Ownership	AU Public
Ratings	Satisfaction (Approach)	3
	Satisfaction (Deployment)	3
	Satisfaction (Results)	2
	Satisfaction (Improvement)	4
	Confidence	Medium
Practices	Identification/Selection	IT business plan; Annual planning; Selection of the wrong projects; Wasted resources; IT-business relationship issues
	Priority Setting	Priority setting by departments; Priority setting by IT department (enterprise projects); No formal criteria or weightings; Lacks formality; Political behaviour; Lack of visibility of all projects; Duplication of projects
	Project Approval	Multiple sets of procedures; Simple (one page only); Lacks formality and rigour; Inaccurate estimation; Not standardised; Benefits overstated; Distributed funding control; Manipulation of processes
	PIR/Closure	Formal project closure; Closure not applied consistently; Lack of interest in closure reports; Success formally defined (in project statement); Some projects stopped (but not enough projects); Lessons learned managed by PMO; Lessons learned not used
	Benefits Realisation	No benefits realisation process; Benefits not measured; Lack of accountability

4.4.10 Company M10

Company M10 is a leading international gold exploration, mining and production company. Annual revenue for the Australian operations is greater than $A0.5b but less than $A2b.

Overall, the confidence of the IT director was medium. This level of confidence was based on the governance processes in place to deliver IT projects. However, there was uncertainty about whether benefits persisted down the track since there was no formal post-project benefits realisation assessment. The major evaluation challenges were business engagement (particularly at the start and end of a project), justifying projects with intangible benefits and changing business requirements. Evaluation processes were ‘one size fits all’ and the key improvement identified was to develop a scaled or more flexible process.

All capital investments in company M10 follow a standard project management process. The company PMO manages the project guidelines but does not facilitate evaluation processes. All IT opportunities are assessed using an IT ranking tool with scores for value (economic,

environment and social), resources (CAPEX, OPEX and HR), risks and time. The portfolio of IT projects (about $A20m) is then compared and ranked. This is a new process and was recently introduced as part of a move to centralise all IT expenditure. When a project originates outside of the budget cycle, it is ranked against approved projects. While most projects are identified in May/June to align with the budget process there is scope to continually update the process. The ITSC approves the budget for the portfolio and would decide if a new project has more merit than existing projects.

A project goes through four stages or gates: (1) define, (2) initiate, (3) execute and (4) close-out. In the first stage, the opportunity is defined and assessed. The next stage is feasibility, which leads to an application for expenditure (AFE). A business case realisation plan is also developed with detailed best-case and worst-case benefit and cost estimates. After the AFE, estimates are progressively refined via a four-stage change management request process. The process is rigorous and repeatable. However, it is structured to fit the purchase of a new truck fleet, focused on financial criteria and difficult to apply to IT projects. In addition, because the process is not scaled it can become bureaucratic for projects that do not require detailed analysis. There is a lack of top-leadership commitment and business engagement. Benefits are often overstated, solutions are selected then justified and people 'work the system'.

At the completion of a project, there is a formal project close-out by the project manager a few weeks after implementation. The close-out focuses on schedule, budget, deliverables, resources and lessons learned. The results go to the director IT and to business owners, and lessons are used to improve processes and methodologies. Most project managers are contractors so it is difficult to use the lessons for ongoing development of project managers. Getting the business to be engaged in reviews is a challenge and there is no PIR process or benefits tracking.

The use and effectiveness of IT project evaluation in company M10 is summarised in Table 4.31.

Table 4.31: Summary of evaluation practices for company M10

Profile	Company	M10
	Size (Annual Revenue)	≥ $A0.5≤ $A2b
	Focus of Operations	International
	Primary Ownership	International
Ratings	Satisfaction (Approach)	3
	Satisfaction (Deployment)	4
	Satisfaction (Results)	4
	Satisfaction (Improvement)	2
	Confidence	Medium
Practices	Identification/Selection	Ideas tested for alignment; Alignment to budget cycle; Business consultation; Process to manage out-of-cycle projects
	Priority Setting	Priority setting by IT department; Priority setting using formal criteria (value, resources, risks and time); Whole of portfolio view
	Project Approval	Evaluation processes not scaled ('one size fits all'); Single funding approval; Stage gates; Rigorous; Bureaucratic; Benefits overstated; Political influence; Focus on financial criteria; Lack of top-leadership commitment
	PIR/Closure	Formal project closure; Completed by project manager (not independent); Standard success criteria; Lessons learned used (by IT department); Lack of business engagement
	Benefits Realisation	No benefits realisation process; Benefits not measured; Lack of accountability

4.4.11 Company M11

Company M11 is an international miner and manufacturer of alumina. Annual revenue from Australian operations is about $A1b.

Overall, confidence that IT projects are delivering benefits to the company is high. This is based on the critical role of IS in the business and post-project reviews involving analysis of benefits. On a project-by-project basis, the benefits expected are not always realised in full; however, significant benefits have been realised overall in terms of increased efficiencies, improved productivity, better information and communication. The major evaluation challenges for company M11 were the measurement of intangible benefits and balancing strategic (global) benefits with the local impact. The improvements identified were greater accountability for results and more focus on ongoing benefits tracking.

IT projects are driven from a global strategy with rigorous performance targets that must be met. Nothing is done in isolation and there is greater global consistency of IT systems. However, this can make it harder to react locally and be flexible to the needs of local customers. The process can also become tied down in bureaucracy and projects may be

delayed. The result is sometimes a compromise and not the best system for Australia. There is broad consultation as part of the annual planning and budgeting process with various teams that manage global initiatives. However, it is a complicated environment to work in due to multiple lines of reporting locally and globally.

All company projects follow a standard process: (1) needs identification, (2) blitz team process, (3) contract book, (4) authorisation, (5) organise project, (6) implementation and (7) review project. There are two points of approval: project management approval (contract book) and funding approval (authorisation). Requests for funds cover project studies, contract book preparation, prototyping or trialling, and/or project implementation. However, often there is a single funding approval for the complete scope of work. For example, the deployment of ERP in the company was based on a single funding request of $A75m. The contract book describes the project in detail including the stakeholders, scope, problem definition, alternative solutions, estimates, expected benefits and project plan. If the total cost is greater than $A20k or the work is assessed as medium risk or above, then it is managed as a formal project. Otherwise, a 'light' project management process is used.

Formal measures of success are defined during the project 'blitz' process, which is a formal kick-off session involving all stakeholders where scope, boundaries and success criteria are established. In the post-project review, there is a set of standard criteria against which each project is rated as poor, fair, good or excellent. The criteria are authorised amount; on schedule; environmental, health and safety; economic savings achieved; and deliverables from decision analysis. For example, economic savings is rated as 'poor' if less than 80 per cent of benefits are achieved and 'excellent' if more than 100 per cent of benefits are achieved.

Company M11 has a formal project critique meeting at closure involving the project team and customer representatives. A project acceptance certificate is signed and lessons learned captured. However, there is no formal process to ensure lessons learned are transferred to future projects. A PIR (or 'post-project review') is also conducted within six months of project commissioning for projects >$A100k. The asset owner is responsible for ensuring that the follow-up review is completed and the focus is on project performance, outcomes and overall success. For infrastructure projects, savings are then measured and tracked globally. However, for application projects there is no tracking of benefits beyond the PIR.

The use and effectiveness of IT project evaluation in company M11 is summarised in Table 4.32.

Table 4.32: Summary of evaluation practices for company M11

Profile	Company	M11
	Size (Annual Revenue)	≥ $A0.5≤ $A2b
	Focus of Operations	International
	Primary Ownership	International
Ratings	Satisfaction (Approach)	4
	Satisfaction (Deployment)	3
	Satisfaction (Results)	2
	Satisfaction (Improvement)	3
	Confidence	High
Practices	Identification/Selection	Comprehensive ('95% captured'); Broad consultation; Alignment to global strategy; Central (global) decision making; Rigorous performance targets; Global consistency of systems; Complexity; Bureaucracy
	Priority Setting	Priority setting by global teams; No formal criteria or weightings; Whole of portfolio view; High willingness to stop projects
	Project Approval	Governance scaled to project value (two tiers); Standard company processes; Formal; Rigorous; Single funding approval; Funding for scoping and pilot studies; Stage gates
	PIR/Closure	Formal project closure and PIR ('post-project review'); PIR conducted six months after closure; Scaled PIR (>$A100k); Success formally defined and measured; Lessons learned captured but only shared informally
	Benefits Realisation	Benefits tracking for infrastructure projects; One-off process (for other IT projects); No benefits tracking beyond the PIR; Lack of accountability

4.5 Description of Cases: Electricity, Gas and Water Supply

4.5.1 Company U1

Company U1 is a state-based energy retailer with annual revenue of about $A1.5b. Overall, confidence that IT projects are delivering benefits to the company is medium. This is attributed to the capabilities of the IT team rather than business processes. The major challenges faced when evaluating IT projects are the reliance on existing IT systems that limit choices (and/or thinking), estimation and measurement of benefits, and access to data to compare internal costs to outsourcing. Currently, each business area follows their own approach to project evaluation and a key improvement is the introduction of a standard methodology that is applied consistently across the company. To succeed this will require an

improvement in business engagement and communication, not just the documentation of a new set of processes.

Company U1 has evaluation procedures but they are not clearly defined or specific to IT. The company intends to introduce a centralised project methodology for all projects and this is currently under development. There are two tiers of governance for projects. The CIO approves projects <$A100k and this is handled by the IT processes already in place. For projects >$A100k the new centralised project methodology will apply that uses a stage gate process. The new process involves five phases with four-stage gates: (1) concept, (2) qualify, (3) justify, (4) deliver and (5) benefits.

At the moment, concept identification is unstructured and informal. Priority setting is not based on formal criteria and 'whoever shouts loudest' gets priority. All ideas that are proposed become active opportunities and many are sustained until funds become available. In the qualify process, the business requirements documentation is completed by a business analyst from the IT department. At this stage, estimates should be +-40 per cent. At the justification phase a business case is developed. However, sometimes the business will write the business case without proper consultation with IT. At this stage, estimates should be +-20 per cent. There is a range of business case documents in the business and each department is 'wedded' to their format. Also, once projects are underway they are generally not stopped since there are no criteria for making this decision.

Tangible and intangible benefits are estimated in the business case. However, there is no standard method for identifying and estimating benefits, and estimates are often inconsistent and unrealistic. There is a tendency to overstate benefits in order to gain approval. Moreover, there is no process to track benefits after the closure of a project and no one is held accountable for determining if the stated benefits were realised. There are multiple project closure and PIR templates in the company. Both the closure and the PIR processes are 'messy' and often not completed. Project success is not formally defined and generally a project is considered successful if the system is implemented without issues, and delivered on schedule and budget.

The use and effectiveness of IT project evaluation in company U1 is summarised in Table 4.33.

Table 4.33: Summary of evaluation practices for company U1

Profile	Company	U1
	Size (Annual Revenue)	≥ $A0.5≤ $A2b
	Focus of Operations	AU State
	Primary Ownership	Government
Ratings	Satisfaction (Approach)	4
	Satisfaction (Deployment)	3
	Satisfaction (Results)	2
	Satisfaction (Improvement)	2
	Confidence	Medium
Practices	Identification/Selection	IT Strategic Plan; 5-year horizon; Annual and quarterly reviews; Aligned to budget; Opportunity identification lacks formality; Bypassing of IT; Intent to formalise IT relationship managers
	Priority Setting	Priority setting by executive (projects >$A100k); No formal criteria or weightings; Lacks rigour; Political behaviour; Projects not stopped
	Project Approval	Governance scaled to project value (two tiers); Not standardised; Inaccurate estimation; No independent verification of business case; Intent to formalise evaluation processes (stage gates with progressive refinement of estimates)
	PIR/Closure	Formal project closure and PIR; Not standardised; Project closure and PIR not applied consistently; No lessons learned process; Intent to formalise project closure and PIR
	Benefits Realisation	No benefits realisation process; Benefits not measured; Lack of accountability; Success is not formally defined; Intent to formalise benefits realisation (projects >$A100k)

4.5.2 Company U2

Company U2 manages a state energy supply network including electricity, gas and water. Annual revenue is about $A1.6b.

Overall, confidence that IT projects are delivering benefits to the company is medium. This is based on the company's inability to change the way it does business and realise value from these systems. However, it is difficult to 'know for sure' since the company tends to move onto the next project, and there is no PIR or benefits realisation process. The evaluation challenges for company U2 are consistent application of processes and a common basis for project comparison. The improvements identified were formalising and standardising evaluation processes, and identifying decision-criteria for evaluation.

Company U2 has a formal project management methodology (Prince2) but no standardised processes or criteria for evaluation. The company recently established an ICT PMO and formal processes are currently being developed. Until recently there was no top-leadership

commitment to evaluation. There is now executive approval and resources to improve evaluation.

Planning is 'silo' based and driven from middle management. The strategic plan has not been updated for four years and the identification of opportunities tends to be *ad hoc* and not always aligned to business plans. Templates have been designed for preliminary assessment, expenditure proposal and business case. All projects follow the same templates and Prince2 processes, and governance is not scaled (with the exception of the delegations required for approval). The ICT council approves IT projects and sets priorities across the group. The council is made up of the executive manager and IT managers. Priority setting is subjective but the intent is also to formalise this process using a matrix of nine weighted business priorities. The aim is to provide greater focus and improved visibility of all IT projects across the company.

A formal project closure report is completed by the project manager and covers quality, time and cost performance, customer acceptance and follow-on recommendations. There is no formal lessons learned process; one has been written but does not appear to be used. There is also no PIR or benefits realisation process. At the moment a PIR is only conducted if a project goes through the audit committee, which means it was a 'disaster'. Success is not formally judged beyond project management criteria and a project is successful 'if I still have a job'. There is a lack of interest in *ex-post* evaluation since the results may be potentially embarrassing. According to the ICT program office manager, there have been plenty of large disasters but they are not presented as failures since the sponsor will 'spin doctor' the results.

The use and effectiveness of IT project evaluation in company U2 is summarised in Table 4.34.

Table 4.34: Summary of evaluation practices for company U2

Profile	Company	U2
	Size (Annual Revenue)	≥ $A0.5≤ $A2b
	Focus of Operations	AU State
	Primary Ownership	Government
Ratings	Satisfaction (Approach)	3
	Satisfaction (Deployment)	2
	Satisfaction (Results)	1
	Satisfaction (Improvement)	1
	Confidence	Medium
Practices	Identification/Selection	Driven from business issues (middle management); Silo-based; *Ad hoc*; Lacks formality; Projects not always linked to business plans
	Priority Setting	Priority setting by ICT council; No formal criteria or weightings; Subjective; Intent to formalise
	Project Approval	Governance not scaled; Not standardised; No independent verification of business case; Inconsistent application of processes; Benefits not accurately identified; Focus on financial criteria
	PIR/Closure	Formal project closure; Completed by project manager (not independent); No formal lessons learned process; Intent to formalise PIR
	Benefits Realisation	Benefits realisation plan in business case; No benefits realisation process; Benefits not measured; Lack of accountability; Success is not formally defined; Project failures; Political influence

4.5.3 Company U3

Company U3 manages a state electricity network and is fully owned by a state government. Annual revenue is greater than $A0.5b but less than $A2b.

Overall, the satisfaction of the IT program manager with processes is low to medium, and confidence is medium. Confidence is medium based on a recent IT satisfaction survey but not high, because there is no process in place to prove whether benefits are realised. The key challenges for company U3 are getting business buy-in to IT projects and having a common basis for project comparison. IT projects are treated differently to other projects and are easily 'parked' since it is easier for the business to understand capital investments than investments in IT. The main improvement identified was to encourage general managers to own strategic IT projects and treat them equally as part of the business program.

IT opportunities are identified as part of an annual planning process that produces a business and IT plan. Other projects originate from day-to-day changes involving IT or major process improvement programs that require changes in IT. Thus, IT projects are aligned to the

strategy and sponsored by the business. If a project is identified as part of the planning and budget cycle, then the process works smoothly. However, if it is identified out of the annual cycle there are often delays and managing business expectations becomes difficult.

Company U3 has three tiers of governance: investments with a three-year total lifecycle cost of less than $A100k, investments between $A100k and $A500k, and investments greater than $A500k. The level of detail required for business cases and financial modelling is scaled to the value of the project. If a project is greater than $A1m then it goes to the IT council, composed of business general managers, for review and prioritisation. The IT council reviews a range of project criteria and then discusses the ranking of projects. Projects with high compliance or safety requirements tend to be approved quickly irrespective of the cost. However, the process has a short-term focus on enhancements and most strategic IT projects are stalled. These projects are compared to other company projects, such as installing power to a gold mine, and do not tend to be approved. In addition, business resources are a critical constraint but these are not considered part of the process.

For all IT projects a project closure report is completed by the project manager. The focus is on finance and schedule (budget versus actual), a customer survey (results versus expectations), and a completion checklist. Thus, success is judged only against project management criteria, namely, schedule, cost and customer satisfaction. The sponsor signs off the project, and the documents and lessons learned are stored by the PMO. However, the lessons learned are not accessible to others, including the IT department.

For major projects, a PIR is completed six months later. This is completed by the internal audit department. The focus of the PIR is how the project was conducted, whether it had proper governance, whether it achieved budget and cost were recorded properly, and the results and outcomes. There is no benefits realisation process or accountability and therefore benefits are often overstated in order to get approval. There was a previous attempt to implement benefits realisation but it stalled when managers realised that they would be held accountable. The process did not have high-level support, project approval became more difficult and eventually the process was bypassed. There is now top leadership support and the intent is to implement a benefits realisation process again.

The use and effectiveness of IT project evaluation in company U3 is summarised in Table 4.35.

Table 4.35: Summary of evaluation practices for company U3

Profile	Company	U3
	Size (Annual Revenue)	≥ $A0.5≤ $A2b
	Focus of Operations	AU State
	Primary Ownership	Government
Ratings	Satisfaction (Approach)	2
	Satisfaction (Deployment)	3
	Satisfaction (Results)	2
	Satisfaction (Improvement)	2
	Confidence	Medium
Practices	Identification/Selection	Comprehensive; IT business plan; 3-year horizon; Annual review; Lack of business buy-in; Alignment to strategy; Lacks flexibility; Delays to projects out of budget cycle
	Priority Setting	Priority setting by IT council (projects >$A1m); Priority setting using formal criteria and management judgement; Short-term focus; Strategic IT projects delayed; Imbalance in project portfolio
	Project Approval	Governance scaled to project value (three tiers); Formal; Comprehensive procedures and templates; Stage gates (four stages with decision points); Benefits overstated
	PIR/Closure	Formal project closure and PIR; PIR conducted six months after closure (for major projects); Centrally coordinated by PMO; Consistently applied; Lack of business interest; Lessons learned captured but not used
	Benefits Realisation	No benefits realisation process; Benefits not measured; Lack of accountability; Intent to formalise benefits realisation

4.5.4 Company U4

Company U4 is one of the largest energy suppliers in Australia and manages electricity infrastructure, and supplies electricity and gas. Annual revenue is about $A2.6b.

Overall, confidence is medium. Confidence is low because there is no benefits realisation process to review the benefits claimed. Conversely, business cases are rigorous and provide a higher level of confidence. The key challenges identified were the measurement of benefits, business engagement and establishing a commercial focus with accountability for results. The key improvement identified was establishing agreed criteria for prioritisation.

There is a five-year company strategy and an annual plan aligned to the budget. The IT budget is about $A25m per annum. To submit a project into the plan, a business project submission form is completed. The form requires a sponsor and is tied to the sponsor's budget. This sometimes makes sponsors reluctant to take on projects. However, in reality, budgets do not really change as savings tend to be absorbed by new projects. There is a bit of 'first in best dressed' in the July-December period, as funds are available and a good business case has a

good chance of getting approved. Further, every year a particular asset management project has always been in the budget but a business case has never been submitted. This is used as a 'slush fund' for projects that are identified after the budget cycle.

Once a submission form is approved, a business case is submitted. There are two types: a short form for projects less than $A250k and a more detailed long form for projects greater than $A250k. The business cases are reviewed by IT for architectural alignment and by finance for consideration of alternative options and financial estimates. If the project requires IT CAPEX then it is submitted to the IT committee for decision making and prioritisation. The IT committee membership includes the general managers and the CIO. There is no list of criteria for prioritisation and generally, a project manager would lobby the general managers before a committee meeting to back their project. There is a great deal of politics involved and the decision making is very subjective. Essentially, it is based on the ability to persuade and influence stakeholders rather than the quality of the business case.

About two weeks after implementation, the project manager completes a PIR and project closure report. The PIR covers the results of the project (achievement of objectives, measurement against critical success factors and performance baseline), financial performance, business risk assessment and lessons learned. The project closure report covers administrative activities. Three months later a second PIR is then conducted by the IT PMO. The PIR covers people, processes and technology and has a project management focus. However, there is a lack of interest in completing the PIR by the project team as they have moved onto the next project. The results go to the sponsor who must make a formal reply to the issues. The PMO distributes the lessons learned to all project managers. Templates exist for benefits realisation but are not used. While there is a company scorecard linked to the strategy, the benefits from individual projects are not measured.

The use and effectiveness of IT project evaluation in company U4 is summarised in Table 4.36.

Table 4.36: Summary of evaluation practices for company U4

Profile	Company	U4
	Size (Annual Revenue)	>$A2b
	Focus of Operations	AU National
	Primary Ownership	Government
Ratings	Satisfaction (Approach)	3
	Satisfaction (Deployment)	3
	Satisfaction (Results)	1
	Satisfaction (Improvement)	2
	Confidence	Medium
Practices	Identification/Selection	5-year strategy; Annual plan; Alignment to strategy; Silo-based; Political behaviour; Budget cycle distortions; Manipulation of processes
	Priority Setting	Priority setting by IT committee; No formal criteria or weightings; Subjective; Informed decision making
	Project Approval	Governance scaled to project value (two tiers); Independent verification of estimates; Consistent application of processes; Identify sufficient benefits; Rigorous; Bureaucratic; Political influence
	PIR/Closure	PIR and closure combined; PIR and closure completed by project manager (not independent); Second PIR conducted by IT PMO three months after closure; Lack of interest in second PIR (project team has 'moved on'); Lessons learned used
	Benefits Realisation	No benefits realisation process; Benefits not measured; Lack of accountability; Company measurement system (scorecard)

4.5.5 Company U5

Company U5 provides state water services with annual revenue greater than $A0.5b but less than $A2b.

Overall, both satisfaction with processes and confidence is high. There are key checkpoints in the process where projects will not proceed if stakeholders are not satisfied with progress. The major evaluation challenges for company U5 are clarity of business requirements and getting managers to take a corporate rather than individual business view when setting priorities. The processes are being continuously improved.

IT projects follow the same Capital Investment Procedure (CIP) as all other projects. There is single point of control for all IT funds and managers must follow the mandated procedures in order to get funding. Capital investment is broken into different programs, including a five-year IT program that is derived from the company and IT strategy. Annually, an outline of the IT program of work is submitted for funding and a level of funding (about $A20m) is allocated. The approval process is formal and rigorous. For example, often the business

approaches IT with solutions and the planning section takes them back through a structured process to understand the business need. The business may view this as being bureaucratic. However, projects are closely controlled and according to the IT program manager, this rigour results in improved IT project outcomes.

All IT projects are prioritised and ranked using a template with weighted criteria. The criteria are corporate risk, benefits, project risk, project dependencies and strategic alignment. Guiding principles also ensure that projects that maintain the asset base or are part of the business improvement program are given higher rankings. If a project is funded ('above the line') then it is planned and scheduled. The processes are scaled according to project value. 'Category A' projects are greater than $A5m, 'Category B' greater than $A500k, 'Category C' greater than $A200k and 'Category D' less than $A200k. A project proposal and business case are mandatory for all projects. Category A and B projects follow a two-step funding process with the first stage of funding for scoping the project. Category C and D projects have a single funding approval. Projects follow a stage gate process and there is a willingness to stop projects at these gates.

There are formal project closure and PIR processes. However, PIRs are not applied consistently and there is lack of interest in completing them. There is also a benefits tracking process for large projects (>$A200k). The benefits realisation process starts with a benefits plan. Business managers are responsible for drafting the plans and reviewing if benefits are achieved. The project office interviews business managers about six to 12 months after implementation and collates the information. However, not all business managers measure the benefits and the process requires a higher profile at the CEO level. The company is moving towards programs of work and measuring the benefits of overall programs. In terms of accountability, there is a financial impact statement approval at the start of the project and this is tied to future budgets. Business managers are also responsible for overall business results, which are monitored via company measurement systems and individual performance agreements.

The use and effectiveness of IT project evaluation in company U5 is summarised in Table 4.37.

Table 4.37: Summary of evaluation practices for company U5

Profile	Company	U5
	Size (Annual Revenue)	≥ $A0.5≤ $A2b
	Focus of Operations	AU State
	Primary Ownership	Government
Ratings	Satisfaction (Approach)	4
	Satisfaction (Deployment)	4
	Satisfaction (Results)	3
	Satisfaction (Improvement)	4
	Confidence	High
Practices	Identification/Selection	5-year program of work (based on company and IT strategy); Annual update; Comprehensive; Business engagement; Strong alignment to strategy
	Priority Setting	Priority setting using weighted criteria (corporate risk, benefits, project risk, project dependencies, strategic alignment); Whole of portfolio view; High willingness to stop projects
	Project Approval	Governance scaled to project value; Single point of funding control; Stage gates; Rigorous; Independent verification of estimates; Accurate estimation; Progressive refinement of estimates; Success is formally defined by project sliders; Some process avoidance ('short-cuts')
	PIR/Closure	Formal closure and PIR scaled to project value; Use of lessons learned (but can be improved); PIR conducted 6–12 months after closure; PIR not applied consistently; Coordinated by PMO; Responsibility of business manager; Lack of interest in PIRs
	Benefits Realisation	Formal benefits realisation process (for projects >$A200k); Benefits realisation plan; One-off process; Coordinated by PMO; Benefits not always measured; Accountability for results (via benefits interview and budgets); Business managers accountable for overall results (performance agreements); Company measurement system (use of existing measures)

4.6 Summary of Case Descriptions

This chapter provided a description of the evaluation practices in each of the 36 case study companies. The descriptions focused on the context of the company, ratings of *satisfaction* and *confidence*, and descriptions of IT project evaluation practices at different project stages.

The individual cases serve as the evidentiary base for the study and are used as the basis for the cross-case analysis in Chapter 5. The 36 companies were from three industry sectors with varying levels of ICT investment and had a range of IT evaluation practices. Overall, there was a greater focus on IT project evaluation within companies in the Finance and Insurance sector. However, all industry sectors had companies with varying levels of satisfaction with IT project evaluation practices and varying levels of confidence that IT projects were delivering benefits.

The case study summaries provide insights into how organisations evaluate IT projects, to what extent organisations formally evaluate IT projects and how organisations define IT project success. From the examination of individual cases, key focus areas for understanding *effective* IT project evaluation practices also started to emerge:

- The degree of top-leadership commitment and business engagement;
- The alignment between business strategy and IT strategy;
- Resource allocation and control of IT projects;
- IT project evaluation processes, roles and responsibilities;
- Measurement and feedback mechanisms; and
- Action from evaluation and accountability for results.

The next chapter presents the cross-case analysis and the emergence of a new theoretical model for improving IT project evaluation practices.

CHAPTER 5 A NEW THEORETICAL MODEL

5.1 Introduction

The previous chapter presented an overview of results and descriptions of the evaluation practices in each of the case study companies. This chapter aims to present the emerging theory and a new theoretical model for improving IT project evaluation practices. It explains the key concepts of effective IT project evaluation: commitment, focus, control, scale, integration and action. While these concepts may be discussed in isolation in the extant IT project management literature, few studies present them in an integrated manner and relate them to effective IT project evaluation outcomes and IT project success.

This chapter is organised as shown in Figure 5.1.

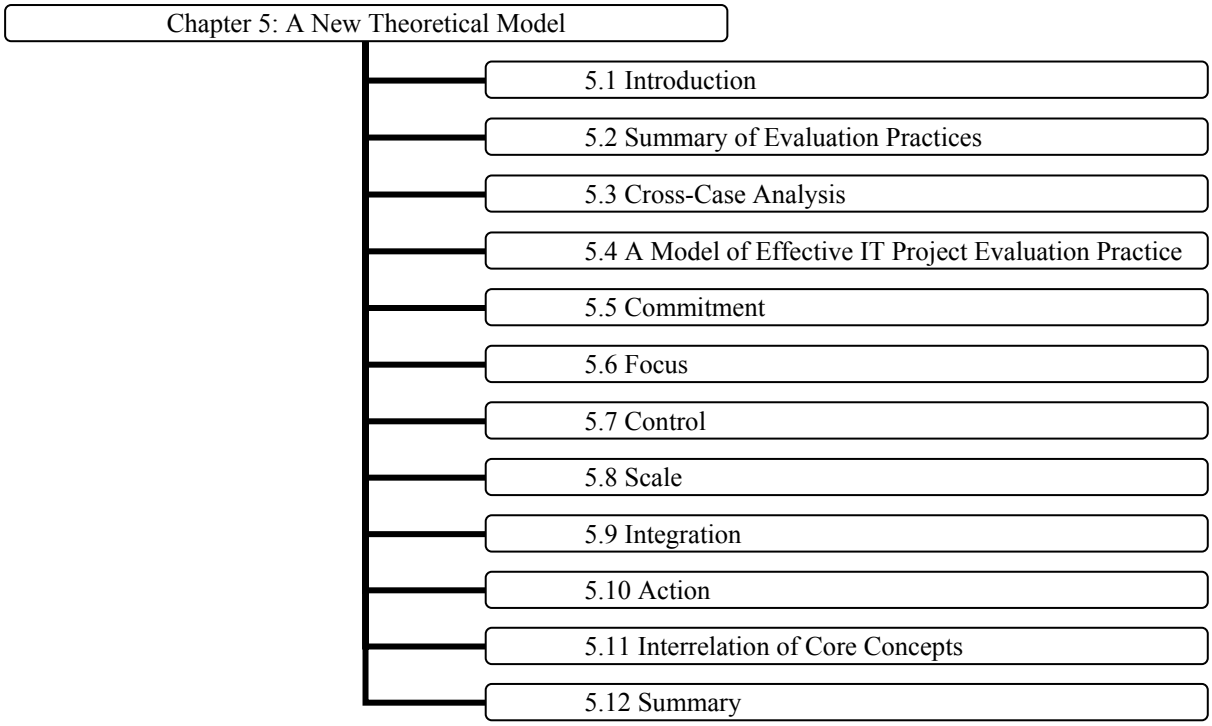

Figure 5.1: Chapter 5 outline

The next sections describe the results from the cross-case analysis and present a new theoretical model of effective IT project evaluation practice. A summary of evaluation practices across the 36 case study companies is discussed next.

5.2 Summary of Evaluation Practices

5.2.1 Satisfaction and Confidence

Participants were asked to rate overall *satisfaction with IT evaluation processes* in their company. Average responses from the 36 companies are shown in Table 5.1. The aim of the analysis was to understand patterns in practice across the 36 companies and three industry sectors. Given the small sample size, and the aim of the sampling, no claim is made of statistical significance in the interpretation of these results.

Table 5.1: Mean overall satisfaction with evaluation practices, by industry sector

Evaluation dimension	Description	Mean satisfaction score (1=not at all, 5=very)		
		F&I	M	E,G&WS
Approach	What the organisation plans to do	3.9	3.3	3.2
Deployment	How well the approach is actually implemented and adopted	3.5	3.0	3.0
Results	How evaluation results are monitored and used	2.8	2.2	1.8
Improvement	How evaluation processes are reviewed and improved	3.2	2.9	2.2

The results show that most companies in the study perceive a need to improve evaluation practices. While 58 per cent (21) of the companies rated satisfaction with their 'approach' as 4 or higher (on a Likert scale from 1 = 'not at all' to 5 = 'very satisfied'), only 36 per cent (13) rated 'deployment' as 4 or higher. This suggests that, for most companies, the gap in evaluation practices extends beyond the actual approach taken in terms of the processes and methods used, to issues of implementation. Supporting this view, in over one-third of companies (15), interviewees identified the 'consistency of processes and their application' as a key area for improvement.

> *Competitive advantage is not in the processes and templates but how you use them (Chief Information Officer, F10).*

Participants were also asked to rate their *confidence that IT projects are producing business benefits* for their company, using a scale of high, medium and low. Three companies rated confidence as low, 18 companies as medium, and 15 as high. The main reasons for high levels of confidence were related to project selection and approval processes, and reviews of benefits post-implementation. The main reason for lack of confidence was the lack of measurement of benefits post-implementation. Although confidence was also related to other

factors, there appeared to be a relationship between *satisfaction with IT evaluation processes*, in particular project appraisal, and *confidence that IT projects were producing business benefits.*

Overall, the study found a mix of evaluation practices across the 36 case study companies. However, some patterns of evaluation practice were also evident within industry sectors. Companies in the Finance and Insurance sector had, on average, a higher level of satisfaction with their evaluation processes and higher levels of overall confidence that their IT projects are producing benefits. Fifty per cent (10) of companies in the Finance and Insurance sector had a high level of confidence, compared to four in the Mining sector and one in the Electricity, Gas and Water Supply sector. For Finance and Insurance companies, IT systems were core to business operations and there were high levels of IT investment. Most projects had an IT component, and were described as 'business' projects or 'IT-enabled' projects.

In the Mining sector, IT was not considered core to operations and was often treated as 'a commodity'. The IT budget was low relative to the overall company budget, and as a result, there was less focus on IT projects by senior leadership. In general, IT projects in the Mining sector tended to have less governance or followed standard approval processes more suited to large capital investments. For companies in the Electricity, Gas and Water Supply sector, the average level of satisfaction with evaluation processes was the lowest of all three sectors. Evaluation processes appeared to be influenced by public sector ownership. Four out of five companies had limited or no *ex-post* evaluation and a 'lack of accountability' for project results. The evaluation processes of these companies were generally less established, and reflected an industry that had recently undergone massive change, including privatisation and restructuring.

5.2.2 Portfolio Selection and Project Approval Processes

Consistent with the literature cited in Chapter 2, most companies placed a higher level of importance on *ex-ante* rather than *ex-post* evaluations. Table 5.2 summarises the use and effectiveness of portfolio selection and project approval processes among participant companies. All 36 companies had a process for identifying potential IT projects and for project approval, although the formality of these processes varied widely. Less than half of these processes were considered effective. The main issues identified were consistent application and adherence to processes, ownership and understanding of the processes, the

time taken for approval, distortions of the budget cycle, alignment with strategy, politics in decision making, and the appropriate level of rigour. Priority setting and portfolio management was considered by 25 per cent (9) of companies as a key area for improvement and by 47 per cent (17) of companies as a major challenge. Not surprisingly, only 47 per cent (17) of companies described their priority setting processes as effective. While exactly one-half of companies (18) had no formal criteria for priority setting, nearly half of these (8) considered their practices effective.

Table 5.2: Portfolio selection and project approval processes, by industry sector

	Identification/Selection			Priority Setting			Project Approval		
	F&I	M	E,G&WS	F&I	M	E,G&WS	F&I	M	E,G&WS
Effective Process	14	4	1	12	4	1	10	2	2
Have Process	20	11	5	20	9	5	20	11	5
No Process	0	0	0	0	2	0	0	0	0

5.2.3 Post-implementation Review and Benefits Realisation Processes

Table 5.3 summarises the use and effectiveness of post-implementation review and benefits realisation processes in the case study companies. Some form of closure or post-implementation review was conducted by 32 (89 per cent) of the companies; however, only nine (25 per cent) considered their processes effective. The terminology used by companies varied and in some cases, closure was simply an administrative process. However, in general, post-implementation reviews were used to evaluate project success and to identify lessons learned to improve the future success of projects.

Table 5.3: Post-implementation review and benefits realisation processes, by industry sector

	Post-implementation Review/Closure			Benefits Realisation		
	F&I	M	E,G&WS	F&I	M	E,G&WS
Effective Process	7	2	0	5	0	0
Have Process	19	8	5	7	1	0
No Process	1	3	0	13	10	5

Only 22 per cent (8) of the companies had a process in place to track benefits from individual projects, and just over half of those (5) were considered effective. A further nine companies used their one-off post-implementation review process to measure benefits and none of these were considered effective. Instead of benefits realisation, many companies relied on the accuracy of their project appraisal processes. Post-implementation reviews were often only conducted for larger projects or when ‘things went wrong’. The reasons for not conducting

post-implementation reviews and benefits realisation included lack of management support, unclear ownership of processes, limited accountability, resource constraints, difficulties with measurement and attribution, and inadequate use of evaluation results.

5.2.4 Key Challenges

Participants were asked to identify the major *challenges* that their company faces when evaluating IT projects. The key challenges identified by participants are listed in Table 5.4, with the frequency of occurrence listed to indicate the prevalence of themes within the sample group. The three most prevalent challenges to overcome in order to be effective were identified as business engagement, portfolio management, and estimation and measurement of costs and benefits.

Table 5.4: Key evaluation challenges

Theme	Company Count	Evaluation Challenge
Business Engagement	22	Business Engagement; IT-business Relationship; Continuity of Evaluation; Expectations Management; Top-Management Commitment
Portfolio Management	17	Priority Setting; Common Basis for Project Comparison; Portfolio Management; Balancing Long-Term and Short-Term; Growth in Compliance Projects
Estimation and Measurement	16	Measurement of Benefits; Measurement of Intangibles; Access to Data; Estimation of Benefits; Estimation of Costs; Accuracy of Estimates; Rapidly Changing Environment; Measurement of Costs; Measurement of Quality; Data Quality; Commercial Focus
Project Justification	10	Project Justification; Alignment to Strategy; Consideration of Alternatives; Justifying IT Infrastructure; Justifying Projects with Intangible Benefits; Focus on Value not Cost; Complexity of Projects
Evaluation Processes	7	Process Consistency; Right Level of Rigour; Planning Flexibility; Implementing Post-implementation Review; Clarity of Roles/Responsibilities; Updating Processes
Requirements and Scope	7	Clarity of Business Requirements; Changing Business Requirements
Evaluation Resources	5	Resource Constraints; Knowledge and Skills
Objectivity of Evaluation	3	Objectivity of Evaluation; Getting Honest Feedback
Execution and Control	3	Efficient Execution of Projects; Business Change Management; Control of IT Environment

Business engagement was identified by 61 per cent (22) of companies as a key challenge. This was particularly an issue in the Mining, and the Electricity, Gas and Water Supply sectors. In these sectors 73 per cent (8) of companies and 80 per cent (4) of companies,

respectively, identified engagement as a key challenge. For most of the companies in these sectors, it was 'tough' to get the business actively involved in IT project evaluation. In particular, access to the business, different stakeholder expectations and the continuity of business resources made it difficult to establish and then maintain engagement, particularly for longer duration projects. Difficulties engaging the business in evaluation processes were also often exacerbated by IT-business relationship issues.

> *A challenge is getting business buy-in. You can evaluate IT projects but if you end up with two separate lists of IT projects and business projects, then IT projects can be easily 'parked'. It is easier for the business to get their 'heads around' capital investments than investment in IT (IT Program Manager, U3).*

Managing a portfolio of projects and setting priorities was another commonly identified challenge. The issues with portfolio management included having a common basis for comparison across all projects, taking a whole of company view, and balancing the portfolio of short and long-term investments as demanding. In the Finance and Insurance sector, the growth in compliance (mandatory) projects made achieving this balance even more difficult.

> *There is a tension between the projects you need to do to support infrastructure, the projects that drives benefits and the projects you have to do due to legislation. We are now spending about $20m a year on making mandatory changes due to legislation. We need to be able to balance these investments (Workstream Driver, F5).*

Estimation and measurement of costs and benefits was also frequently identified as a challenge. Companies struggled with the intangible nature of many IT benefits, and had difficulty quantifying these benefits and relating them to business outcomes. In most companies, there was a focus on financial criteria for decision making, using methods such as net present value, internal rate of return and payback period. Where intangible benefits were listed in the business case, they were generally not reviewed post-implementation. In a rapidly changing business environment there was also increased uncertainty about project outcomes that made it difficult to measure results against the original business case, or to attribute these results to an individual project. For cost estimation, many IT projects were considered unique and this made it difficult to estimate the duration and resources for the project. Access to data and data quality also made estimation and measurement more challenging.

In addition, other challenges identified included project justification, alignment of projects to strategy, applying the right level of rigour, understanding business requirements, objectivity of evaluation, and resource constraints.

5.2.5 Opportunities for Improvement

Participants were also asked to identify how evaluation practices could be *improved*. The opportunities for improvement identified by participants are listed in Table 5.5, with the frequency of occurrence listed to indicate the prevalence of themes within the sample group. The three most commonly identified improvements were the consistent application of evaluation processes, estimation and measurement, and ownership and commitment.

Table 5.5: Opportunities for improvement

Theme	Company Count	Identified Improvement
Consistent Application	15	Consistent Application
Estimation and Measurement	15	Benefits Realisation; Measurement of Benefits; Measurement of Costs; *Ex-post* Evaluation; Identification of Benefits; Continuous Focus on Benefits
Ownership and Commitment	11	Top Management Commitment and Ownership; Business Engagement; Accountability for Results; IT-business Relationship; IT Leadership
Communication and Education	10	Understanding of Roles/Responsibilities
Portfolio Management	9	Portfolio Management; Prioritisation; Single Point of Funding Control
Level of Formality	9	Process Simplification; Process Rigour; Greater Flexibility; Greater Formality; Project Governance
Corporate Learning	7	Lessons Learned Used; Continuous Improvement
Alignment with Strategy	6	Alignment with Strategy
Requirements and Scope	4	Understand Business Requirements; Analysis and Planning
Evaluation Resources	2	Resource Commitment

Consistency of processes and their application was the most frequently identified opportunity for improvement. As discussed earlier, the gap in evaluation practices went beyond the actual approach taken in terms of the processes and methods used, to issues of implementation. Companies identified a desire to ensure that evaluation processes were *used* on a consistent basis, and applied in a consistent manner for each project.

The processes for post-implementation review and benefits tracking were also identified as key areas for improvement. While estimation was important, the focus for improvement was on the measurement of results. Few companies had effective *ex-post* evaluation. Companies

found measurement to be challenging and tended to focus on *ex-ante* evaluation processes. In terms of cost estimates, having more inclusive estimates of costs that included business costs and not just IT costs was identified.

Ownership and commitment, particularly from senior business leaders, was another significant opportunity for improvement. This theme included raising the IT department's profile within the business and driving improved ownership through accountability for results. Communication and education to improve understanding of evaluation roles and responsibilities was also frequently cited.

> *We need to engage and communicate not just document a set of new processes. People need to relate to the processes if we want them to use them (Manager Program Management, U1).*

Other opportunities for improvement included portfolio management and prioritisation, establishing the right level of formality for evaluation processes, learning and improving from evaluation results, alignment of projects with strategy, understanding business requirements, and commitment of resources to evaluation.

Understanding the challenges faced by companies and their opportunities for improvement provided important insights for the cross-case analysis. This analysis is discussed next.

5.3 Cross-Case Analysis

The findings from the collection of cases were used to define the characteristics of effective IT project evaluation. Participants were asked to rate their *confidence that IT projects are producing business benefits* for their company, using a scale of high, medium and low. Three companies rated confidence as low, 18 companies as medium, and 15 as high. High levels of confidence in IT project outcomes resulted from many factors. However, the main reasons provided by participants related to effective *ex-ante* approval processes, effective *ex-post* measurement of results or a combination of both. Participants also rated their overall *satisfaction with IT evaluation processes* in their company. A meta-matrix was developed listing all of the companies in a ranking order based on the ratings of satisfaction and confidence.

From the cross-case analysis, key focus areas for understanding *effective* IT project evaluation practices emerged:

- The degree of top-leadership commitment and business engagement;
- The alignment between business strategy and IT projects;
- Resource allocation and control of IT projects;
- IT project evaluation processes, roles and responsibilities;
- Measurement and feedback mechanisms; and
- Action from evaluation and accountability for results.

Overall, those companies with high levels of satisfaction and confidence tended to conduct evaluation across the whole project lifecycle and scored high on the following six key dimensions: commitment, focus, control, scale, integration and action. The six dimensions emerged from the coding and were *grounded* in the data, as described in Chapter 3. A description of each dimension of effective practice is shown in Table 5.6.

Table 5.6: Dimensions of effective IT project evaluation practice

Dimension	Description
Commitment	Commitment from the top, business engagement and strong IT-business relationships.
Focus	Focus through alignment to strategy and a shared understanding of project success.
Control	Control and coordination of resources, evaluation processes and projects.
Scale	Scaled processes that balance governance and responsiveness.
Integration	Integrated evaluation, and continuous measurement linking project and company results.
Action	Action from evaluation and accountability for results.

Underlying these six dimensions were 13 effective practices: top-leadership commitment, business engagement, alignment to strategy, an agreed definition of project success, portfolio management, stage gates, dedicated resources, standardised and scaled processes, simple and flexible processes, continuous measurement, integrated evaluation cycle, accountability for results, and use of results.

A meta-matrix that groups companies by confidence, satisfaction (approach), satisfaction (deployment) and effective IT project evaluation practices is provided in Appendix 6. A high rating represented strong evidence of a practice while a low rating indicated the absence of that practice. The results provide support for the proposition that companies who have commitment, focus, control, scale, integration and action have higher levels of overall satisfaction with their evaluation processes and higher levels of overall confidence that their

IT projects are producing benefits. While the specific evaluation approach of each company differed, the dimensions of effective IT project evaluation practice represent higher order concepts, which were common.

Overall, the six key dimensions of effective IT evaluation were associated with higher levels of confidence and satisfaction. Six of the sampled companies had medium to high levels of commitment, focus, control, scale, integration and action, and high levels of confidence and satisfaction (F2, F4, F5, F10, M6 and U5). Six companies had an absence of effective practices, and five of these companies had medium to low levels of confidence and satisfaction (F12, M2, M4, M9 and U2). The sixth company, M3, had a medium level of confidence, and medium to high satisfaction with evaluation practices. The Australian operations of the company delivered only a small number of IT projects and the high level of satisfaction with deployment was related only to its *ex-ante* evaluation processes.

There were a couple of exceptions. Companies F16, F17, M5 and M7 had high levels of confidence despite having either limited or no *ex-post* evaluation processes. The reason given for their high levels of confidence was the rigour of their *ex-ante* approval processes. In these cases rigorous project approval provided confidence that IT projects were delivering benefits, even though these benefits were not actually measured. Evaluation processes in companies F16, F17 and M5 were strongly aligned to strategy, which helped provide a focus for evaluation. For these three companies, this confidence may also be partly attributed to their size. These companies were relatively smaller companies and perceived less need for formal processes since they managed less IT projects. In companies F16 and F17, *observed improvements in company performance* and *informal feedback* were both given as additional reasons for high levels of confidence. In company M5, a personal conservative approach to approval was taken. Also, despite high levels of confidence, companies F16, M5 and M7 had medium to low levels of satisfaction with their evaluation processes, and all four companies indicated a desire to improve evaluation practice.

In addition, the findings suggest that it is the *combination* of all six key dimensions of effective IT project evaluation practice in a company that results in high levels of confidence and satisfaction. Therefore, it is not surprising that some of the practices were also present in companies with medium to low levels of satisfaction and confidence, such as company F6 and U3. For example, company U3 had formal standardised processes with stage gates but lacked

management commitment, accountability and action. As a result, the company had issues with the effective implementation of evaluation processes.

Evaluation practices were influenced by a range of environmental factors including industry, size of the company, strategy and company culture. Culture influenced the formality of processes and the degree of focus on performance. For example, companies F14 and U4 had cultures that lacked commercial focus and did not hold managers accountable for results. Industry differences tended to be related to the nature of the business, the competitive environment, the importance of IT to operations and the size of the IT budget relative to the company budget. Mining companies such as M2 and M4 tended to be action-orientated, focused on mining operations and had a lack of process. Corporate structure also had an influence, particularly in relation to international and subsidiary companies. The processes of company F13 were heavily influenced by its parent company and were bureaucratic.

Given these results, it seems reasonable to suggest that companies with commitment, focus, control, scale, integration and action had higher satisfaction with IT project evaluation and greater confidence in IT project outcomes. From this cross-case analysis, a model of effective IT project evaluation practice emerged.

5.4 A Model of Effective IT Project Evaluation Practice

Across the 36 companies, six key dimensions of effective IT evaluation practice were found to be related to effective IT project evaluation outcomes leading to more efficient use of resources and improved IT project success. Underlying these dimensions were 13 effective practices: top-leadership commitment, business engagement, alignment to strategy, an agreed definition of project success, portfolio management, stage gates, dedicated resources, standardised and scaled processes, simple and flexible processes, continuous measurement, integrated evaluation cycle, accountability for results, and use of results. A model of effective IT project evaluation practice is represented in Figure 5.2.

In particular, it was when these effective practices *were combined* that positive behaviours were reinforced, actions were aligned, and evaluation processes were accurate, responsive and consistent. Most of the effective practices were found within six companies, F2, F4, F5, F10, M6 and U5, with four being from the Finance and Insurance sector. By contrast, companies F12, M2, M3, M4, M9, and U2 were found to have the least effective practices. The majority

of these companies were from the Mining sector.

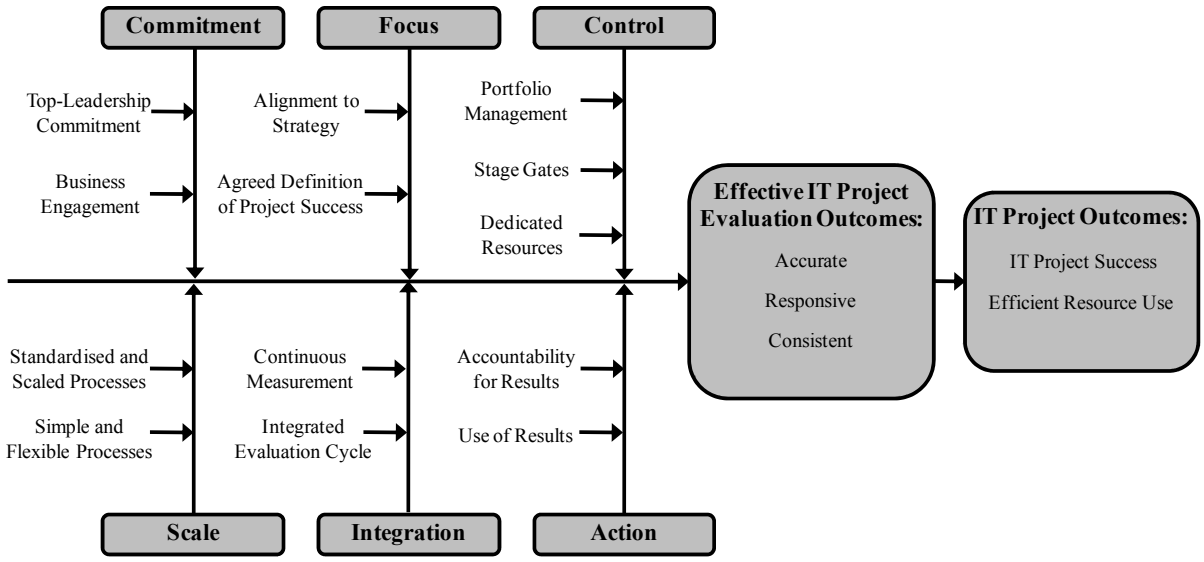

Figure 5.2: Model of effective IT project evaluation practice

The contribution of this study is an integrated model for improving IT project evaluation. Based on the data from the 36 case study companies, effective IT project evaluation outcomes and improved IT project outcomes were found to be closely related to the six key dimensions presented in Figure 5.2. First, evaluation was effective when there was commitment from senior leaders and the business. Second, a clear focus was achieved during *ex-ante* evaluation by aligning projects to strategy and having an agreed definition of project success. Third, control at both a project and portfolio level was enabled by stage gates, portfolio management and dedicated resources. Fourth, effective evaluation processes were scaled to balance governance and responsiveness. Fifth, evaluation and measurement were continuous and integrated. Finally, the use of evaluation results and accountability reinforced the effectiveness of evaluation practices.

A description of each component of the model is shown in Table 5.7.

Table 5.7: Components of the effective IT project evaluation model

Components of the Model		Description
Effective Practices	Top-Leadership Commitment	Evaluation processes have commitment and involvement from the business at the executive level; Evaluation is driven from the top-down.
	Business Engagement	IT projects are managed as business projects and driven from the business; There is shared responsibility and a strong IT-business relationship.
	Alignment to Strategy	IT investments are aligned to company strategy and objectives; Projects are driven from strategy and new ideas tested for strategic alignment.
	Agreed Definition of Project Success	Formal success criteria are agreed at the start of a project; Adjustments are made during the project based on the relative importance of the criteria.
	Portfolio Management	Decision making is made in the context of a portfolio of projects, not in isolation; Projects are continuously managed as a portfolio of investments.
	Stage Gates	Stage gates are used to approve project stages, control funding and progressively refine estimates.
	Dedicated Resources	Dedicated resources are used to coordinate evaluation processes, maintain quality standards, provide independent reviews and improve processes.
	Standardised and Scaled Processes	Standard evaluation processes are used that are scaled to the project; Processes are formal but not too formal; Roles are clearly understood.
	Simple and Flexible Processes	Simple evaluation processes are used and are applied with flexibility; Evaluation processes are not rigid, complex or bureaucratic.
	Continuous Measurement	Project success is consistently measured, with a focus on benefits; Project measurement is integrated with company performance measurement.
	Integrated Evaluation Cycle	*Ex-ante* and *ex-post* evaluation processes are integrated across the project lifecycle, including the measurement of benefits post-implementation.
	Accountability for Results	Managers are accountable for results; Results are measured against performance targets at both the project and company level.
	Use of Results	Evaluation forms the basis for action; Evaluation results are actively used for accountability, decision making and continuous improvement.
Effective IT Project Evaluation Outcomes	Accurate	The correct projects are selected; Estimation and measurement is exact and without errors.
	Responsive	Evaluation processes respond quickly; There is timely decision making and action from evaluation.
	Consistent	Evaluation is completed when required and is completed in a consistent manner.
IT Project Outcomes	IT Project Success	A multi-dimensional construct that is a combination of project management success, technical success and business success.
	Efficient Resource Use	Resources are allocated and used to achieve value for money; Resources are not wasted.

Each of the six key dimensions of effective IT evaluation practice on the left of Figure 5.2 is now discussed in turn.

5.5 Commitment

Commitment from senior executives and the business were both necessary for evaluation to be effective. Effective evaluation starts with leadership, commitment and support from the top. Companies with top-leadership commitment and business engagement had greater satisfaction with IT project evaluation and greater confidence in IT project outcomes.

Table 5.8 groups companies by level of confidence, top-leadership commitment and business engagement. Eight of the companies had high levels of top-leadership commitment, business engagement and overall confidence (group 1). Over one-third (13) of the companies had a lack of top-leadership commitment, low levels of business engagement or both. All of these companies had low to medium levels of overall confidence (groups 10–14).

Table 5.8: Companies grouped by confidence, top-leadership commitment and business engagement

Group	Companies	Confidence	Top-Leadership Commitment	Business Engagement
1.	F2, F4, F5, F9, F10, F17, F18, M6	High	High	High
2.	F3	High	High	Medium
3.	U5	High	Medium	High
4.	F14, F16, M11	High	Medium	Medium
5.	M5, M7	High	Medium	Low
6.	F1	Medium	High	High
7.	F20, U1	Medium	High	Medium
8.	F13, F15, F19	Medium	Medium	High
9.	F8, F11	Medium	Medium	Medium
10.	F7, U2, U4	Medium	Medium	Low
11.	F6, M1, M8	Medium	Low	Medium
12.	M3, M9, M10, U3	Medium	Low	Low
13.	M2	Low	Medium	Low
14.	F12, M4	Low	Low	Low

5.5.1 Top-Leadership Commitment

A characteristic of those companies with effective evaluation practices was commitment from the top. If leadership does not think evaluation is important it will not get done. Companies such as F2, F5 and F10 spoke of cohesive top management buy-in and support, resulting in more consistent and timely decision making. This was enacted through the involvement of the leadership team in the evaluation process, in both decision making roles and ensuring a culture of accountability.

The business is totally engaged in this and it is driven from the CEO down (IT Program Manager, F2).

Ownership and commitment from management was identified as a key desired improvement by 11 companies. Those companies without top-leadership commitment had less effective evaluation outcomes. For example, a previous attempt by company U3 to introduce benefits realisation stalled due to lack of management commitment. Other companies also gave examples where evaluation processes became ineffective without top management support.

The IT aspects of the budget get lost; say $30m in terms of billions. There is no IT steering committee or other structures because they became ineffective. Managers would not turn up and would send replacements who could not make decisions (Project Management Office Manager, M9).

Fifteen of the sampled companies had a high level of top-leadership commitment, and medium to high levels of overall confidence. Nine companies identified a lack of top-leadership commitment to IT project evaluation. All of these companies had medium to low levels of confidence that IT projects were producing business benefits. Six of the nine companies were from the Mining sector, specifically companies M1, M3, M4, M8, M9 and M10. For most of these companies, the lack of interest by senior management was due to the size of the IT budget relative to the overall business and a low IT impact on mining operations.

The challenge for IT projects is that the scale of funding is trivial compared to the overall company budget - less than 0.1 per cent of the total budget. Therefore, it is not high on the management 'radar' to worry about IT projects (MIS Service Delivery Manager, M3).

Closely related to the level of top-leadership commitment to IT project evaluation was the level of ownership and engagement by the business.

5.5.2 Business Engagement

Most companies said that evaluation processes worked best when the business drove the processes rather than the IT department. A strong IT-business relationship based on trust and

shared responsibility provided the basis for effective IT investment decisions. For companies where a strong relationship existed, such as F2 and F10, this resulted in ownership by the business and more effective evaluation outcomes in terms of selecting the right projects, focused project delivery, accurate estimation, and reduced politics.

> *The engagement process with business is sound and it is not just what IT thinks is a good idea (IS Program Office Manager, M6).*

In contrast, the IT department in companies such as F12 said that they were viewed as a 'service department' rather than a critical 'business enabler'. They described an ineffective IT-business relationship in terms of lack of communication, IT being bypassed or not consulted during decision making, and the business being unwilling to provide subject-matter experts for evaluation. Access to and engagement of the business was identified by 61 per cent (22) of companies as a significant challenge. This was an issue particularly in the Mining sector where only one company (M6) described an environment with strong business engagement and seven mining companies identified a lack of business engagement.

> *There are some business people who have their own 'barrow to push' and have a lack of understanding of current technology. They are able to influence decisions and bypass IT (IT Systems Administrator, M2).*

Notably, there was a distinct difference in terminology used by companies depending on the relationship between IT and the business. When projects were driven by the business, they were seen as 'business' projects or 'IT-enabled' projects and not 'IT' projects. The relationship between IT and the business was one of shared responsibility and the IT function were not 'order takers'. However, in the Mining sector, in particular, IT was often considered 'a commodity'. This resulted in greater challenges in terms of obtaining access and information from the business and had a serious negative impact on the effectiveness of IT project evaluation.

> *A weakness is the tension between process 'parochialism' and IT 'centricity'. This often results in: Business units buying proposed solutions that do not meet corporate requirements or corporate IT infrastructure, and IT approaches unrelated to the business unit need, respectively (Assurance Manager, M9).*

When the IT department had to drive evaluation processes, this resulted in less ownership and accountability by the business. In such cases, projects were often based on the 'best guess' of the IT department. Company M5 attempted to engage the business but with limited success.

> *The business has not yet grasped the potential of the steering committee to govern what is going on. There is not the correct mix on the steering committee…we need more strategic thinkers. At the moment three out of eight managers ask questions and the rest are led by IT (Global Manager IT Services, M5).*

In addition to commitment from the business, a clear focus was necessary for evaluation to be effective.

5.6 Focus

Focus was achieved through alignment to strategy and a shared understanding of project success. This study found that companies that aligned IT projects to strategy and defined success upfront had greater satisfaction with IT project evaluation and greater confidence in IT project outcomes.

Table 5.9 groups companies by level of confidence, degree of strategic alignment and formality of success construct. One-quarter of the companies had high alignment to strategy, a highly formal success construct and high levels of overall confidence (group 1). Nineteen of the sampled companies had high alignment to strategy, and medium to high levels of overall confidence (groups 1, 2, 5, 6 and 7). Twelve of the sampled companies had a highly formal success construct, and medium to high levels of overall confidence (groups 1, 3, 6 and 8). Eight of the companies had low alignment to strategy and/or no formal success construct, and all of these companies had low to medium levels of overall confidence (groups 10–13).

Table 5.9: Companies grouped by confidence, strategic alignment and formality of success construct

Group	Companies	Confidence	Alignment to Strategy	Formality of Success Construct
1.	F2, F3, F4, F5, F16, M6, M11, U5	High	High	High
2.	F10, F18	High	High	Medium
3.	F14	High	Medium	High
4.	F9, M7	High	Medium	Medium
5.	F17, M5	High	High	Low
6.	F13	Medium	High	High
7.	F1, F6, F7, F8, F19, F20	Medium	High	Medium
8.	F15, M1	Medium	Medium	High
9.	F11, M8, M10, U3, U4	Medium	Medium	Medium
10.	U1	Medium	Medium	Low
11.	M9	Medium	Low	Medium
12.	M3, U2	Medium	Low	Low
13.	F12, M2, M4	Low	Low	Low

5.6.1 Alignment to Strategy

It is necessary to align IT investment decisions to a corporate strategy in order to provide a consistent basis of comparison and select the right projects, thereby balancing both long and short-term goals.

> *We deal with about 100 projects per year. The annual planning process starts from the corporate strategy and cascades to business strategies for each functional unit. Targets are set and each functional unit develops business strategies from issues and responses to those issues. Each functional unit submits bids for funding in a ranked order. The program management office interacts with the management team and determines a cut-off. The projects are discussed relative to strategy, high-level cost estimates and a view of the benefits (Workstream Driver, F5).*

There were two levels of positive strategic alignment. At the highest level, those companies with effective evaluation practices *drove* IT-related investments from the strategic plan. In other words, the strategy drove the projects not vice versa. To do this first required a clearly articulated strategy, which for companies like M2, M4 and U2, was not always in place. For these three companies evaluation tended to be less focused and driven by business issues. A lower level of still-positive alignment occurred if a project came up out of the planning cycle and was evaluated against strategic fit or the existing strategies. In such cases, the project was not driven by the strategy, but was identified and then was tested against the strategy. The use of consistent evaluation criteria tied to the strategic intent of the company for both project

selection and priority setting was an effective practice. In some cases, these criteria were also weighted to reflect relative strategic priorities or projected growth areas.

> *Prioritisation used to be done within portfolios but recently we have broken the business into 20 business areas that cross these silos. We looked at the growth potential of each area and have aligned projects to these 20 areas based on the opportunities for growth (Chief Information Officer, F1).*

Projects were often identified outside of a standard (annual) planning cycle. The companies with the most effective evaluation practices drove projects from their strategy *and* tested new opportunities for strategic alignment. An effective practice was aligning projects to the strategic objectives of the company. In company F18, all projects were linked to objectives in the company strategy map. Company F3 used results chains to help understand how projects linked through various drivers to strategic objectives.

> *From 120 projects, about 30 projects were selected and prioritised by management based on round table discussions. The predominant criterion for selection was the link to strategic objectives (Chief Information Officer, F16).*

In other companies, there was no attempt to align IT investments to strategy. In such cases, project selection was not tied to the direction of the company, decision making was inconsistent, and resources were not used effectively.

> *There is not a consistent corporate approach to business planning. We have just started strategically evaluating what the company is trying to do. Before this point we just had IT delivery people and IT projects were centrally controlled and approved (IT Superintendent, M4).*

An agreed definition of project success was another effective practice that provided focus to IT project evaluation.

5.6.2 Agreed Definition of Project Success

Those companies with a formal success construct and high levels of confidence varied in how they defined success. Some of these companies used a balanced scorecard, some used success

sliders, and others used a combination of project delivery measures and benefits realisation. However, what was common across these companies was that their definition of success was widely understood and agreed. A balance of success criteria were used (about five), there was a clear distinction between project management success and business success, and there was a clear focus on the delivery of benefits. These companies either had a company-wide definition of success or agreement between the project team and sponsor (or steering group) on the definition of success at the start of a project.

> *I am very confident that IS projects are delivering benefits. This is based on the project's delivery objectives stated at the beginning of the project and agreed to by the sponsors (IS Program Office Manager, M6).*

Several participants suggested that the practice of defining success upfront (in the business case, project charter or TOR) created a common understanding between the sponsor and the project team of how performance would be judged and what was important, which helped with managing and meeting expectations. Companies F4, F13, F14, F16, M1 and U5 all weighted their success criteria at the start of a project and made project management adjustments during the project in accordance with the relative importance of the selected criteria. For example, company F13 weighted the four perspectives of a balanced scorecard (Financial, Customer, Process and Team), while company F16 weighted five criteria, which they called sliders.

> *For each project the management team or steering committee ranks the five most important 'sliders' for a project from the following list: on time, on budget, value added back to the organisation, meeting its objectives and quality of delivery. They are called 'sliders' because the project is tracked by these and as the project progresses these may be adjusted. However, they also indicate what 'levers need to be pulled' and when a project should be stopped (Chief Information Officer, F16).*

The nine companies that had formal success criteria and high confidence (F2, F3, F4, F5, F14, F16, M6, M11, U5) all used 'delivery of benefits' as a key criterion for success. For these companies there was also a clear distinction between project management success and business success. For example, company F5 measured two facets of success: project delivery and business benefits. Project delivery was measured by quality, delivery to schedule and delivery to costs (QDC). Business benefits were measured using KPIs.

> *A successful project will achieve a 16 or better QDC and achieve 100 per cent or better aggregate KPI. We are now expected to deliver on all KPI targets and if we achieve 100–120 per cent there are more incentives. However, it is capped at 120 per cent because we do not want people under-estimating benefits (Project Portfolio Manager, F5).*

Eight companies had no formally agreed success construct (F12, F17, M2, M3, M4, M5, U1 and U2). The CIOs, program office managers and project managers of these companies tended to describe success in simpler terms, with only one mentioning 'delivery of benefits' as a criterion (and noting that they did not actually measure this). These companies considered an average of four criteria with the main ones being *on time*, *on budget*, *met requirements*, *system implementation* and *system use*.

> *Typically success equals implementation and use. If the project goes to term and gets delivered (a lot do not) and people are using it, it would be judged a success (Team Leader IT Project Management, F12).*

In addition to the practices associated with providing a clear focus during *ex-ante* evaluation, this study found several effective practices associated with the control and coordination of evaluation.

5.7 Control

The *control* of resources and evaluation processes was the next dimension of effective IT project evaluation practice. Companies who made evaluation decisions in the context of a portfolio of projects, closely controlled resources and scope using stage gates, and allocated dedicated resources to IT project evaluation, had greater satisfaction with IT project evaluation and greater confidence in IT project outcomes. Portfolio management was used to control resources at a portfolio level and stage gates were used to control resources at an individual project level. In addition, dedicated resources provided the impetus required to coordinate evaluation, maintain standards and improve processes. When companies had dedicated resources, evaluations were more likely to be completed and to be completed consistently.

Table 5.10 groups companies by level of confidence, portfolio management, stage gates and dedicated resources. The profile of each company was very different resulting in 25 groups of companies out of a possible 36. Eight of the companies had medium to high levels of portfolio management, stage gates and dedicated resources, and high levels of overall confidence (groups 1–3). Nearly half (17) of the companies did not have portfolio management, stage gates or dedicated resources. Twelve these companies had low to medium levels of overall confidence (groups 11 and 17–25). Of the other companies, F16, F17, M5 and M7 were discussed in Section 5.3 as exceptions. The other exception, company F3, was a highly diversified company and lacked an effective portfolio management process across the group.

Table 5.10: Companies grouped by confidence, portfolio management, stage gates and dedicated resources

Group	Companies	Confidence	Portfolio Management	Stage Gates	Dedicated Resources
1.	F2, F4, F5, F10, U5	High	High	High	High
2.	M11	High	High	High	Medium
3.	F14, F18	High	High	Medium	Medium
4.	F17	High	High	Medium	Low
5.	F16	High	High	Low	Medium
6.	M5	High	High	Low	Low
7.	F9, M6	High	Medium	High	High
8.	F3	High	Low	High	High
9.	M7	High	Low	High	Medium
10.	F19	Medium	High	High	Medium
11.	M10	Medium	High	High	Low
12.	F8	Medium	High	Medium	High
13.	F6	Medium	High	Medium	Medium
14.	F1, F20	Medium	Medium	High	High
15.	U3	Medium	Medium	High	Medium
16.	F13, F15, U1	Medium	Medium	Medium	Medium
17.	F11, M3	Medium	Medium	Medium	Low
18.	U4	Medium	Medium	Low	High
19.	M1, U2	Medium	Medium	Low	Medium
20.	F7	Medium	Low	High	High
21.	M8	Medium	Low	Medium	High
22.	M9	Medium	Low	Low	Low
23.	M2	Low	Low	Medium	Low
24.	F12	Low	Low	Low	Medium
25.	M4	Low	Low	Low	Low

5.7.1 Portfolio Management

The management of projects as a portfolio of investments was an effective practice. Companies who made investment decisions in the context of a portfolio selected the right

projects and made more efficient use of resources. Those companies with effective practices, such as F2, F4, F5 and F10, had visibility of all projects in their portfolio, an effective process for setting priorities, and continuously managed their portfolio of investments and opportunities. These companies had higher levels of satisfaction and confidence.

> *I am very confident that projects are delivering benefits. We are exceeding company profit and cost-income targets each year. This suggests that the portfolio is correct and we are doing the right projects (Chief Information Officer, F10).*

Priority setting and portfolio management was considered by nine companies as a key area for improvement and by 17 companies as a major challenge. Companies such as F12 and M7 lacked visibility of all IT projects in the company. Portfolio management appeared to be particularly challenging for larger companies with multiple divisions, such as companies F3 and M9. Company F3 identified adoption of a portfolio management approach and a common rating system for group-wide selection of investments as key improvements. Smaller companies, such as companies F16 and F17, had a small number of IT projects with less complex organisational structures and their portfolios could be more easily managed. A lack of visibility and control of the project portfolio led to selection of the wrong projects, duplication of projects and wasted resources.

> *The projects are not ranked against each other in a company-wide fashion and there are no standard evaluation criteria. There may be overlaps with the same problems solved in different parts of the organisation or projects that are at odds with each other. There is a lack of visibility of all projects. Thus, projects get initiated that should not and we spend in areas that do not get a return (Project Management Office Manager, M9).*

When decisions were made outside of the context of a portfolio of projects, evaluation was isolated to single project decisions and was less effective. In company U1, decision making was on a case-by-case basis. All ideas that were proposed became active opportunities and many were sustained until funds become available. Evaluation lacked rigour and became a 'hurdle' rather than a foundation for effective decision making and governance. Isolated decision making resulted in a disjointed approach and did not make best use of company resources.

In terms of prioritisation a portfolio of projects is kept and maintained. However, in the last two years there has been no bona fide competition for funds and if the business puts together a business case it will get approved. There is no rigour to setting priorities because this has not been necessary (Team Leader IT Projects, M1).

Companies with the most effective evaluation practices, considered all projects within a portfolio of investments. A key challenge for many companies was having a common basis for project comparison. In company U3, IT projects were treated differently to other projects and were easily 'parked' since it was easier for the business to understand capital investments than investments in IT. Portfolio management was most effective when priorities were set between projects using clearly defined and consistent evaluation criteria balanced with management judgement. Ideally, the portfolio included a balance of both short-term and long-term investments aligned to strategy.

Effective portfolio management involved more than a one-off process of setting priorities. Companies with effective practices *actively* managed the portfolio based on the performance of projects and changes to business priorities, and made adjustments to the portfolio. New opportunities were assessed against the current project portfolio, and there was a willingness to stop projects and redirect resources. Companies such as F10 and M5 were 'constantly re-prioritising' and managing the portfolio to achieve 'effective use and visibility of capital'. An active portfolio management approach was supported by resources, such as a steering committee and PMO.

All projects are approved, prioritised and reviewed by an executive committee, the project governance board. The ongoing balancing of the project portfolio considers objective evaluation criteria based on the combination of business value, financial measures and the risk involved within each project. These evaluation criteria help shape the overall value and risk level of the project portfolio. The formal scoring system is balanced with the judgements of the project governance board. There is a high willingness to stop projects if strategic priorities change and the project portfolio is regularly reviewed (Chief Information Officer, F18).

Some companies had visibility of the whole project portfolio and set priorities at a point in time (usually annually), but did not have processes for the ongoing management of the

portfolio. In many cases, a rigid annual budget process created distortions and made portfolio management more difficult. This often resulted in behaviours to manipulate processes.

> *There is a bit of 'first in best dressed' in the July to December period as funds are available and a good business case has a good chance of getting approved. Also, every year a particular asset management project has always been in the budget but a business case has never been submitted. This is used as a 'slush fund' for projects that are identified after the budget cycle (Manager Business Improvement, U4).*

Visibility of IT project and the effective management of the portfolio were enabled by a single point of (central) funding control. For example, companies F2, F4, F5, F10, F14, F18 and U5, had central funding control, which allowed for closer control of the project portfolio. Companies M6 and M10 were moving to central funding control, and company F7 identified that evaluation practices had improved following the recent centralisation of IT. Conversely, companies F3, M2, M4, M8 and M9 all had distributed funding control, identified issues with projects bypassing IT, and lacked a whole of portfolio view. Company M9 had previously attempted to implement portfolio management processes but failed due to a lack of funding control.

5.7.2 Stage Gates

The use of stage (or 'toll') gates to approve project stages, control funding, and refine estimates was an effective practice. Stage gates provided the opportunity to stop projects if circumstances changed or there were significant over-runs in cost and schedule. Trials of projects (or 'pilots') and scoping studies provided a similar opportunity to test assumptions and stop projects before too many resources were committed. A staged approach to evaluation resulted in more accurate estimates, efficient use of resources and improved IT project success.

> *I am confident in the processes of the company. There are key checkpoints where a project will not proceed unless the stakeholders are 'happy' with the progress (Manager Project Office, IS Branch, U5).*

Sixteen companies used some form of stage gate process, 12 companies had a two-step funding process for project scoping and delivery, and eight companies used a single funding

approval with no evidence of stage gates. Companies achieved high levels of control by using stage gates to progressively refine estimates and release funding for the next stage of a project. For example, company F9 used a stage gate process and managed projects in six phases. Each stage gate had deliverables for the ITSC and a decision was made whether to proceed or not. Estimates were progressively refined from +100 per cent, -50 per cent during the concept phase, to +50 per cent, -25 per cent at the start-up phase, and +20 per cent, -10 per cent at the analysis phase.

> *Things often change between gates…the stage gate process is good because projects cannot 'play' with too much money, especially with consultants involved (Program Office Manager, F4).*

Some companies, such as M8, had a single funding approval but used checkpoints for approving project stages. Company M10 approved funding with a single AFE but used staged change request gateways to closely control the scope of the project. There were five project stages and a change management request form was completed at the end of each stage. Approval was required in order to progress through each stage and for the next stage to commence. Other companies focused on benefits or risks. Company F1 required an updated 'risk map' to be signed off at each stage gate. In company F2, the business sponsor presented to the executive at each stage gate, which reinforced accountability for the project. However, stage gates only became effective when there was a willingness to stop projects and act on the results.

> *At any stage gate a project can get stopped. Sometimes the benefits are not worth the investment or we just have to spend money elsewhere (Project Manager, F5).*

Companies with effective evaluation practices did not attempt to make estimates too accurate upfront but progressively refined them, saving time and resources. Thus, stage gates provided an opportunity to refine requirements, costs and benefits as the project progressed, and the scope of the project became clearer. Company F10 completed the initial analysis quickly but then continually reviewed and adjusted projects. Stage gates provided the opportunity for resource adjustments at both a project and a portfolio level.

> *Prioritisation and approval occurs at each of the stage gates. This allows us to be flexible with the allocation of scarce resources to different opportunities. The reason*

being is that in the initial stages of a project not all the requirements, risks and assumptions are known (Coordinator Project Central, F20).

Companies that did not use stage gates had difficulties controlling projects. Companies M9, U2 and U4 described ineffective evaluation processes in terms of 'inaccurate estimates', 'an inability to stop projects' and 'wasted resources'. In company M4, there was a complete lack of control and many projects 'waffled' along without any clear end point.

There is no stage gate process so projects get approved, and then we run the project until it is finished. There is no documented change process and nothing for scope redefinition (IT Superintendent, M4).

Companies with effective practices generally used stage gates for larger projects, scaled their use to the size of the project and/or applied them with flexibility. For example, company F5 used stage gates to control projects but were 'not slaves to the process'.

5.7.3 Dedicated Resources

Evaluation processes were most effective when they were supported by dedicated resources. Dedicated resources, such as PMOs and customer relationship managers, improved the accuracy, responsiveness and consistency of IT project evaluation. Evaluation did not get done by itself. Dedicated resources were used for understanding business requirements, managing the portfolio of projects, capturing and sharing knowledge, building evaluation expertise, coordinating evaluation processes, maintaining evaluation standards and conducting independent reviews.

Twenty-four companies had a PMO and five intended to establish one. PMOs were used in many different roles. Company F5 had a single central enterprise-wide PMO that managed the overall program of work and ensured the consistent application of evaluation processes. The PMO administered and facilitated evaluation processes, managed projects, tracked benefits, and conducted analysis of program and portfolio results. In company F8, the PMO provided quality assurance and control, and challenged estimates and assumptions. This improved the accuracy of business cases. Companies F4 and U2 also used a PMO to facilitate and improve portfolio management processes.

Corporate projects division acts in an advisory and facilitation role providing expertise to ensure consistency of business cases and benefit plans (Feasibility, Analysis and Design Leader, F3).

IT customer relationship managers were also used by some companies, such as F2 and F9, to understand business requirements, and assist with the development of project proposals and business cases. Thus, relationships managers helped address the challenge of business engagement and improve the accuracy of business cases. Relationship managers were generally business analysts that provided a single point of contact for managing the relationship between the IT department and the business. In company M8, two full-time 'demand coordinators' were used to capture IT project opportunities, provide an initial evaluation and share ideas across business units.

However, some companies with dedicated resources did not use them effectively. In companies F14 and M10, the PMO managed project guidelines but did not facilitate evaluation processes. In company F12, the role of the PMO was only to ensure that costs, schedule and risk were being tracked consistently, not if estimates were reasonable or the project was delivering results. In addition, effective evaluation required specialised skills that were not always found in the business, project managers or IT department. For example, company F16 allocated resources to governance structures but found that having the right skills was still a challenge. Companies M5, M7 and F11 identified the lack of specialist skills for *ex-ante* and *ex-post* evaluation as a limitation to effective evaluation practice.

We are constantly educating people on the framework. Not many people know how to write a business case…or have the skill sets for conducting a PIR. Some project managers are uncomfortable facilitating PIR meetings with more senior stakeholders (Chief Information Officer, F11).

Ex-post evaluations were both completed on a consistent basis (i.e. on every project) and completed in a consistent manner (i.e. using standardised evaluation procedures) when the process was managed by a PMO (or equivalent) and there was an independent verification of results. PMOs were used to ensure evaluation processes were applied consistently, to track benefits after a project team had been disbanded, and to improve project management practices through lessons learned processes. The need for an independent group to manage the process was even more important for companies such as M10 where the project managers

were contractors and left the company shortly after the completion of a project. Company F9 conducted an independent PIR through the Business Transformation Team, and the process was completed accurately and consistently.

> *The PIR and benefits realisation review processes are resourced with one person dedicated to scheduling these reviews, taking lessons learned and building them back into the methodology. This person also identifies skill gaps and develops training plans (General Manager Business Transformation, F9).*

There was a view expressed by some companies that the evaluation of a project should not be conducted by the project team or sponsor, since they had a vested interest in the outcome. This was particularly relevant for companies where project success was linked to performance appraisals and rewards. Companies that effectively managed this tension between performance incentives and the desire to over-report success used formal systems focused on measurement rather than just perceptions, and independently verified results. When project managers completed the PIR, issues with the 'objectivity' of the review were often cited.

> *In project closure it is hard for project managers to be honest and they can be defensive. We try to emphasise that it is not a 'witch hunt' and a process improvement exercise, but this is difficult to sell (Program Office Manager, F7).*

Some companies, such as F6, F19, M4 and M10, were 'resource constrained'. Company M5 had historically not invested in evaluation processes and lacked the skills required for effective project evaluation. However, the company was undergoing rapid growth and had started to invest in these processes. Other companies, such as F17 and M9, did not even have basic governance structures established such as an ITSC. In order to move rapidly, company M2 was fully reliant on external resources. However, this resulted in a lack of project governance and wasted resources.

Commitment, focus and control were not sufficient for IT project evaluation practices to be effective. Evaluation processes also needed to be simple, flexible, standardised and scaled.

5.8 Scale

The *scale* of evaluation processes was the next dimension of effective IT project evaluation practice. Companies with scaled processes that balanced governance and responsiveness had greater satisfaction with IT project evaluation and greater confidence in IT project outcomes.

Table 5.11 groups companies by level of confidence, standardisation and scale of processes, and simplicity and flexibility. Scale was a balancing act between governance and flexibility. Too much governance with not enough flexibility resulted in bureaucratic processes (groups 5, 8, 11 and 14). Too little governance with too much flexibility resulted in a lack of rigour (groups 6, 12 and 15). Thirteen companies effectively balanced governance and responsiveness, and had high levels of overall confidence (groups 1–4). Thirteen companies did not achieve this balance, and had medium to low levels of confidence (groups 11–16). While some level of formal processes appeared to be necessary for evaluation to be effective, it was not sufficient. In company F1, confidence was medium since evaluation results were not used effectively and there was a reluctance to stop projects.

Table 5.11: Companies grouped by confidence and the formality of evaluation processes

Group	Companies	Confidence	Standardised and Scaled Processes	Simple and Flexible Processes
1.	F2, F4, F5, F10	High	High	High
2.	F9, M11, U5	High	High	Medium
3.	F16, F18	High	Medium	High
4.	F3, F14, M6, M7	High	Medium	Medium
5.	M5	High	Medium	Low
6.	F17	High	Low	High
7.	F1	Medium	High	High
8.	F13, M8, U3	Medium	High	Low
9.	F11, F15, F19	Medium	Medium	High
10.	M3	Medium	Medium	Medium
11.	F6, F7, F8, F20, M1, M10, U1, U4	Medium	Medium	Low
12.	M9	Medium	Low	Medium
13.	U2	Medium	Low	Low
14.	F12	Low	Medium	Low
15.	M2	Low	Low	Medium
16.	M4	Low	Low	Low

The development of evaluation processes appeared to follow a clear path of maturity. First the focus was on *ex-ante* evaluation and then on *ex-post* evaluation. In terms of the formality of these processes, companies tended to start with either no evaluation processes or multiple sets

of non-standardised processes. To establish project governance, companies then implemented more formal and often bureaucratic processes. To achieve some balance, evaluation processes were often scaled. Finally, companies with the most mature processes used simple processes and applied them with flexibility.

5.8.1 Standardised and Scaled Processes

The levels of governance and the formality of the evaluation processes applied to a project were commonly tiered, based on the financial value of the project. In a few cases, other criteria were used such as effort, risk, complexity and business impact. The companies with the most effective practices used standardised evaluation processes with an appropriate level of scale. In addition, evaluation roles in these companies were clearly defined and well understood.

Formality, in this study, refers to use of official and prescribed rules for evaluation in the form of procedures, review points, reporting, documentation and meetings/workshops. Formality was not irrelevant. Some level of formality was needed for consistency and to avoid excessive political activity. In addition, too much formality reduced the effectiveness of evaluation processes, due to delays in decision making. However, there was a wide band of companies where formality of IT evaluation processes, methods and techniques did not distinguish those companies with effective practices from those without.

At one extreme, those companies without formal project governance had low levels of satisfaction and low confidence that IT projects were producing benefits. In companies such as M2 and M4, decision making tended to be subjective and there appeared to be greater opportunity for political interference.

> *All IT projects are not formally evaluated. IT budgets are distributed, not centralised, and business units have a fair degree of autonomy about how they spend this money. Project sponsors can initiate a project without any formal documentation no matter what the value is. It is not clear what constitutes an IT project. There are no consistent, controlled, uniform procedures and no centralised governance (Project Management Office Manager, M9).*

At the other extreme, too much formality slowed decision making and, in some cases, resulted

in behaviours to avoid formal approvals, such as the splitting of projects. The challenge was finding the right balance of formality. The following company found that establishing some level of formal evaluation practices helped:

> *Before the introduction of the project management framework we used to work on projects for people who 'shouted loudest', there was no real respect for IT resources, projects were done three times because no processes were in place, and the business did not know how to facilitate a good return (IT Manager, F19).*

While formal and standardised processes were important, a 'one size fits all' approach to governance did not appear to be the solution. This practice was inflexible and inefficient, particularly for smaller projects. In the Mining sector, in particular, a common complaint was that the evaluation process was the same as that 'required to buy a truck'. In company M4, for example, any expenditure greater than 'one dollar' required the completion of a standard CER. In company M5, the ITSC had no delegated authority to approve projects (of any size) and financial approvals were viewed as too rigorous.

> *We had little expertise in software projects and we tried to treat this like a capital project. The approval processes were the same as any large capital project - stringent and with many signatures (Project Manager, M5).*

Companies with the most effective evaluation practices tended to scale the level of governance and the formality of evaluation processes, based on the financial value of the IT project. For example, company F5 scaled governance with 'light' processes and optional stage gates for less complex projects. In company U5, there was an additional funding approval and more rigorous processes for projects with a value greater than $A500k.

However, having formal processes did not always mean that these processes were necessarily used or applied consistently:

> *In general, we have processes documented but they are not strongly enforced. Projects run over the original Application for Expenditure but no supplementary request for funding is put in. For example, one mining project ran $180m over the authorised expenditure limit. They knew this was going to happen but did not submit anything formal. This is just the mining way (Manager Accounting, M3).*

This was particularly an issue for the larger companies with multiple divisions, such as company F3, who tended to have more formal and sophisticated processes. While many of the smaller companies tended to be focused on establishing more formal evaluation processes, the challenge for many of the larger companies was getting managers to actually follow the processes in place.

> *Although there is a standard process, there is some variation in how these processes are applied in each line of Business. Sometimes corporate projects division or IT initiatives, who support these processes, are not consulted (Feasibility, Analysis and Design Leader, F3).*

When evaluation roles were clear and processes well understood, IT project evaluation was more likely to be consistently applied. For example, company M7 had formal processes and scaled governance but its processes were not well understood. Further, inexperienced project managers followed the processes 'by the book' when some steps were intended to be flexible. In companies F6 and M1, governance was scaled but evaluation roles were not clear and processes were not followed consistently.

5.8.2 Simple and Flexible Processes

In terms of the processes and methods used, simplicity and flexibility were key characteristics underlying effective IT evaluation practices. Those companies with flexible processes, such as F2, F4, F5 and F10, had more effective evaluation practices than companies with rigid processes. While flexibility was related to more timely decision making, simplicity was related to the consistent application of processes. In addition, companies with flexible processes were most able to cope with the challenges of a dynamic environment.

Flexible processes included use of 'light' versions of evaluation processes with clear minimum requirements; the ability to start work before all approvals are complete; flexibility in the use of stage gates, dependant on project size and the certainty of requirements; flexible budget provisions for pilot projects and scoping studies; contingency in budgets adjusted for risk; identification of sufficient benefits rather than all benefits; and a focus on continual review rather than full analysis up front. For example, company F10 completed the initial analysis quickly but then continually reviewed projects and had a high willingness to stop them.

[Our parent company] looks at more detail than we would look at before approval. Therefore, the 'burn rate' starts early in the project and a lot of work goes into the business case up front. A business case can take several months to put up and then may not get approved. In [our company] we continually review and the initial approval may not be the most accurate but every time there is a change we go back for approval (Head of Projects Office, F10).

Company F1 had budget processes that provided the flexibility to fund and test new project opportunities.

In addition, five to ten per cent of the budget is put aside for short duration projects less than $A250k. This provides a degree of flexibility. We may also use this funding to kick-off a pilot and test something before deciding if it is useful to proceed to a larger project (Chief Information Officer, F1).

Simple processes included a clear focus on what was important for decision making, and a minimum of paperwork. In company F19, the processes were 'not too prescriptive' and the company attempted to avoid 'red tape'. Although tiered levels of governance were found to be an effective practice, too many different levels, procedures, and methods were not. Simplicity was particularly important given the environment of time pressure, rapid change and limited access to business resources described by participants.

It is a very quick process and the standard presentation is two to three slides. If the CEO cannot be convinced, in three minutes, the manager gets knocked back and that is not good. Therefore, only the good proposals get to the top (Head of IT Department, F2).

Companies with simple and flexible processes maintained an appropriate level of rigour without processes becoming too rigid or bureaucratic. However, about one-third of companies, including F6, F7, F8, F12, F13, F20, M5, M8, M10 and U4, described their processes as 'bureaucratic'. IT project evaluation processes were not responsive, and this often resulted in the avoidance and manipulation of these processes.

It takes months to get projects approved and this time could have been spent getting things done. To get around this, people segment projects to be less than $A100K and

put them through as three work requests rather than one big project (Program Manager, F7).

Companies that were most satisfied with their priority setting processes used formal criteria but balanced these with management judgement. There was a view that formal techniques could only go so far, and that the management team 'knew things that criteria could not account for'. Company F4 found that infrastructure projects were 'dogs' according to formal scoring but were often elevated in priority once reviewed by the leadership team. Others described processes that attempted to be too 'scientific' and were manipulated.

We have had formal criteria and weighting systems in the past but people just changed the answers to get projects approved. If someone has a 'pet project' it will get done (Project Management Office Manager, M9).

When processes were too rigid and lacked flexibility, the business was constrained and opportunities were sometimes delayed.

If we have thought of the project in advance and have the budget then it happens smoothly, but generally ideas do not match up with the budget cycle and changes may have to wait (IT Program Manager, U3).

Well-defined, simple and flexible processes were effective because they were more likely to be consistently applied. By contrast, when processes or methods were complicated, decisions were often not made on a consistent basis, and resources were not put to best use. Other practices that enhanced consistency were a single point of IT funding approval, employment of IT relationship managers, clearly defined evaluation criteria aligned to strategy, and independent verification of project benefits (*ex-ante* and *ex-post*).

The integration of evaluation processes across the project lifecycle was also important for improving evaluation practices.

5.9 Integration

The *integration* of measurement and evaluation processes was the fifth dimension of effective IT project evaluation practice. Companies with high levels of satisfaction and confidence

integrated evaluation across the project lifecycle, and linked project success and benefits measurement to company measurement systems. These companies effectively integrated *ex-ante* and *ex-post* evaluation, employing monitoring and feedback mechanisms for continuous effect.

Table 5.12 groups companies by level of confidence, continuity of measurement and integration of the evaluation cycle. Effective measurement and an integrated evaluation cycle were major challenges and difficult to achieve for most companies. Five companies had high levels of confidence, continuous measurement and an integrated evaluation cycle (group 1). Eight companies had a lack of measurement and integration, and medium to low levels of confidence (groups 10 and 11).

Table 5.12: Companies grouped by confidence, measurement and integration of the evaluation cycle

Group	Companies	Confidence	Continuous Measurement	Integrated Evaluation Cycle
1.	F2, F3, F4, F5, F9	High	High	High
2.	F10	High	High	Medium
3.	M6, U5	High	Medium	High
4.	F18, F14, M11	High	Medium	Medium
5.	F16	High	Medium	Low
6.	F17, M5, M7	High	Low	Low
7.	F8, F20	Medium	Medium	High
8.	F1, F6, F13, F15, F19, M1, M8, M10, U3, U4	Medium	Medium	Medium
9.	F7	Medium	Low	Medium
10.	F11, M9, U1, U2, M3	Medium	Low	Low
11.	F12, M2, M4	Low	Low	Low

5.9.1 Continuous Measurement

An effective measurement regime or system is necessary for accountability. Such regimes were often associated with consistent decision making, focused project delivery, accurate estimation, and corporate learning. Identification and measurement of costs and benefits was identified as a major challenge by 44 per cent (16) of companies. In terms of benefits, only 55 per cent (20) of the companies said that they identify all benefits, and 28 per cent (10) said that they adequately measure them. For costs, the picture was slightly better. Sixty-nine per cent (25) of companies said that they identify all costs, and 75 per cent (27) said that they adequately measure costs.

The key for those companies that were effective at establishing a baseline and then measuring results was a robust company performance-measurement system. In companies such as F2 and F5, measurement was part of 'business as usual'. For these companies, the use of specific evaluation techniques also became more effective. For example, the use of results chains by companies F3 and F5 allowed them to overcome issues of attribution, by understanding and measuring interim outcomes. These measures acted as lead indicators for higher-level outcomes such as sales and profit.

> *Benefits realisation is across three levels. Benefits are monitored at a project level by key performance indicators, the portfolio level by dashboards and then rolled up to the business level. There is a strong connection between project outcomes, the portfolio and the business (Workstream Driver, F5).*

Companies with the most effective evaluation practices maintained a continuous focus on benefits, and measurement was described as 'consistent' and 'accurate'. Where a performance-measurement regime was in place, the accuracy of estimates was also improved by an independent review of the benefits claimed, both 'up front' and after implementation. Companies without any verification often mentioned inaccuracy of estimates.

> *The project business case justified savings of $31.7m over three years. As the project manager I did not see this as credible but my role was project delivery (Project Manager, M1).*

When measurement was an add-on, because an effective performance-measurement regime was not in place, it was more difficult to establish links to strategy and overall performance. Also, due to the additional effort involved, the measurement of benefits both to establish a baseline, and measure results, was unlikely to be done consistently or at all.

> *Managers are not accountable for higher level performance targets. Mines as business units are not measured and judged on their return on capital, so why would a project be judged this way? It needs to be done as a whole not just for individual projects (Manager Finance, M3).*

Companies with effective practices had a strong emphasis on identifying and measuring benefits throughout a project. This focus on benefits also translated to the project team,

reinforced by accountability for results. By focusing performance incentives for the project team beyond simple project management criteria, the focus of the team was shifted to outcomes that encouraged them to work more closely with the business in order to achieve a positive result.

> *Success is defined by the post-implementation review and a balanced scorecard for each project. A bonus of up to 30 per cent of the project team's remuneration is based on the balanced scorecard (Associate Director IT Development, F13).*

In opposition, where the performance of a project manager was judged simply on their ability to deliver a project on-schedule and on budget then achieving overall business results was less likely. For some companies there was a cultural reluctance to measure success or failure. For company M3, there was no accountability for project results and managers did not conduct PIRs since it was often not in their best interests to do so.

> *There is a cultural reluctance to define a project as a failure. At the end of a project there is not really a formal judgement of success (MIS Service Delivery Manager, M3).*

The consistent measurement of success provided the basis for improvement, both of project delivery and benefits delivery. Companies such as F3 and F5 spoke of using measurement to modify implementations or company processes in order to 'drive out benefits'. Measurement also allowed companies the opportunity to stop projects in a controlled manner. Thus, measurement provided the basis to improve IT project outcomes and the use of project resources.

5.9.2 Integrated Evaluation Cycle

Companies that effectively integrated *ex-ante* and *ex-post* evaluation were more satisfied with their evaluation processes and more confident that IT projects were producing benefits. These companies integrated evaluation processes across the project lifecycle and had a process in place to measure benefits after implementation. The main reasons provided for high levels of confidence were related to project selection and approval processes, and reviews of benefits post-implementation. Companies F3 and F5 identified their benefits realisation processes as the reason for high levels of confidence.

I have high confidence that IT is delivering benefits to the organisation. There has been an organisational and IT culture focused on achieving value from IT-centric initiatives. There are governance and measurement systems in place to ensure that benefits are identified and tracked (Group Executive Information Technology, F3).

The main reason for lack of confidence was the lack of measurement of benefits post-implementation. In company F12, confidence was low because there was no measurement of project benefits and the company worked on 'gut feelings'. Companies F6, F13, M9 and U3 all rated confidence as medium and attributed this rating to a lack of benefits measurement.

I am not confident that IT projects are actually delivering benefits because we do not know. There is a lack of empirical evidence to show whether the benefits are achieved or not (Associate Director IT Development, F13).

Companies with effective practices conducted evaluation as part of a continuous and integrated cycle. Integration between *ex-ante* and *ex-post* evaluation was achieved via consistent evaluation criteria, identification and measurement of success and benefits, and *ex-post* feedback to improve estimation and measurement. Companies F2, F4 and F5 integrated the evaluation of IT investments from concept through implementation to realisation of the expected benefits.

Most companies placed a higher level of importance on *ex-ante* rather than *ex-post* evaluations. However, companies that measured project success, and ultimately benefits, were more satisfied with IT project evaluation processes and confident that IT projects were producing benefits. Only eight companies had a process in place to track benefits from individual projects and a further nine companies used their one-off post-implementation review process to measure benefits. Companies with a full benefits realisation process, such as F3, had the most integrated approach to evaluation starting with a benefits plan in the business case. A benefits plan typically identified the benefits, target measurements to be achieved, the method for measuring each benefit, accountability for achieving the benefit, the expected delivery schedule, and how benefits would be monitored.

The consistent measurement of success was a product of a formal measurement process during the project, at project closure and following implementation. Companies who were highly effective at measuring success, such as F4 and F5, measured project management

success using a post-implementation review and tracked benefits for 6–12 months after implementation. Often the post-implementation review was at the six-month point and then ongoing benefits tracking occurred, as required. For company F3, benefits were tracked 'until the governance committee was satisfied'. In comparison, companies such as F1 and F18, attempted to measure benefits at project closure, which was too soon for benefits to be realised.

> *The post-implementation review is focused on closure but should be 12–18 months out, not at the end of a project. It is difficult to claim benefits after the system has just been put in (Head IT Architecture, F1).*

While some form of closure or post-implementation review was conducted by most companies, few considered their processes effective. In some cases, closure was simply an administrative process, rather than a process to evaluate project success and to identify lessons learned for improvement. Four companies had no *ex-post* evaluation, and a further eight companies did not integrate *ex-ante* and *ex-post* evaluation processes. The engagement necessary to complete *ex-post* evaluation was a key challenge, with many companies identifying a 'lack of interest' in evaluation once an IT system had been implemented. Company U2 had PIR templates but they were not used since it was 'embarrassing' to find out the answers.

> *A project is successful if I still have a job! We do not assess projects formally and do not have a good track record for implementing IT systems. It is difficult to get a straight answer on success if you don't do a post-implementation review or benefits realisation, which we do not (ICT Program Officer Manager, U2).*

Most companies found benefits measurement and tracking a particular challenge due to the timeframes involved and the difficulty of attributing benefits to individual projects.

> *It is hard to track benefits in large projects. A project may do ten different things and some succeed and some do not. Benefits realisation depends on market conditions. Also, ten different projects may contribute to a single improvement (General Manager Project Delivery Executive, F6).*

Nevertheless, most companies saw the need for these processes, with the majority expressing the desire to improve PIR or benefits realisation processes.

Companies with high levels of confidence in their IT projects not only integrated evaluation and measurement across the project lifecycle: they also took action from the results.

5.10 Action

The final dimension of effective IT project evaluation practice related to the *action* taken from evaluation results. Companies that actively used evaluation results for accountability, decision making and continuous improvement had greater satisfaction with IT project evaluation and greater confidence in IT project outcomes.

Table 5.13 groups companies by level of confidence, accountability and use of results. Overall, nine companies had strong accountability for results and eight companies effectively used the results from their evaluations. Six companies had high levels of accountability, high use of results and high levels of overall confidence (group 1). Within this group, companies F2, F4, F5 and F10 described themselves as having a 'performance' culture.

Table 5.13: Companies grouped by confidence, accountability for results and use of results

Group	Companies	Confidence	Accountability for Results	Use of Results
1.	F2, F4, F5, F9, F10, U5	High	High	High
2.	F3	High	High	Medium
3.	M6	High	Medium	High
4.	F18	High	Medium	Medium
5.	F14, F16, F17, M7, M11	High	Low	Medium
6.	M5	High	Low	Low
7.	F1	Medium	High	Low
8.	F20	Medium	High	Medium
9.	F8	Medium	Medium	High
10.	F15, F19	Medium	Medium	Medium
11.	F6	Medium	Medium	Low
12.	F7, F11, F13, M9, M10, U4	Medium	Low	Medium
13.	U1, U2, M1, M3, M8, U3	Medium	Low	Low
14.	F12, M2, M4	Low	Low	Low

However, a performance culture was difficult to achieve for most companies.

A major challenge is developing a commercial focus where operations managers are encouraged to realise benefits. We have changed from being a government operated utility but some managers still manage this way (Manager Business Improvement, U4).

Twenty-one companies had a lack of accountability and one-third (12) of companies made limited use of evaluation results. Six companies had high levels of confidence despite having a lack of (low) accountability for results (groups 5 and 6).

5.10.1 Accountability for Results

Companies that held business managers accountable for results had the most effective evaluation practices. Accountability for results drove positive behaviours, improving the accuracy of business cases, and providing the motivation to measure results after implementation. Further, it appeared that accountability addressed many of the significant evaluation challenges identified by companies, in particular, business engagement, and ensuring the accurate estimation of costs and benefits. The fundamental principle was that if managers were held accountable then evaluation was done more accurately and consistently.

When managers were accountable for results, there was no incentive to overstate benefits. Sixty-one percent (22) of the companies did not overstate benefits in order to get approval. In such companies, the main reason given was accountability, though other reasons included rigour in the justification process, independent checks of benefits claimed, and cultural conservatism.

There is accountability for hard financial measures and if a project declares that it will reduce costs then this is reflected in the budget. We are tough on this. This is a good discipline and drives positive behaviours. I have worked in other organisations where managers sign-off on huge revenue increases, for example, but there is no consequence if they do not deliver. In these organisations there is no incentive to question the benefits claimed (Head of IT Architecture, F1).

Different companies achieved accountability in different ways. Accountability for results was enforced through formal project reporting, performance incentives, individual appraisals and department budgets. Some companies even had means for ensuring that benefits were not

under-stated, such as using incentive payments capped at 120 per cent of performance targets. These practices encouraged the sponsor to take ownership of the project, which was often seen as a critical project success factor. Due to its relatively small size, company F19 also achieved a moderate level of accountability through reputation effects. Accountability that was driven from the top leadership team was *most* effective.

> *Because of the governance processes, business managers need to go to Program Promise. It is called this because they are making a promise to deliver and are held to it (Head of IT Department, F2).*

In contrast, those companies without accountability for results tended to have more issues with the accuracy of business cases and, in particular, with the over-stating of benefits. Eleven of the 14 companies who said that benefits were overstated in order to get approval had no form of accountability for results.

> *Benefits do get overstated and this is linked to lack of accountability for project benefits (Global Manager IT Services, M5).*

Companies without accountability for results tended to complete *ex-post* evaluations inconsistently or not at all. There also appeared to be a greater tendency for politically motivated misrepresentations.

> *Generally, the view is that over time or over budget is failure but benefits are not considered. There have been plenty of large disasters but in reality, they are not presented as failures since the sponsor will 'spin doctor' the results (ICT Program Office Manager, U2).*

In relation to the appropriate level of accountability, those companies who measured results against performance targets at both the project and company level tended to have more effective practices than those companies who tied accountability to only one of these levels. Companies F2, F4, F5 and F9 had strong accountability for results at multiple levels. For all of these companies, project benefits were clearly defined ‘up front’ then measured later. These companies were able to trace the impact of individual projects and adjust their project portfolio to achieve overall performance targets.

However, the attribution of benefits to an individual project was difficult since there are many impacts on overall performance. Therefore, some companies such as F1 and F10, made managers accountable only for overall performance targets and did not track the benefits from individual projects. In these companies, projects were linked to objectives and managers were responsible for managing their portfolio of projects to achieve overall results. This practice was effective when estimated project benefits were linked to budgets, thus driving some project-level accountability.

5.10.2 Use of Results

An evaluation process, even one built on a solid foundation of measurement, means very little if the results are not acted upon. Evaluation was most effective when it formed the basis for action. In particular, effective practices were associated with a willingness to stop projects and redirect projects during delivery, to act on the findings of PIRs, and to enforce accountability for results through both incentives and sanctions. The effective use of evaluation results was not only associated with the continuous improvement of evaluation processes, but also reinforced their use.

Companies that were not willing to act on evaluation results did not learn lessons and wasted valuable resources. Some companies, such as M1, M2, M3, U1 and U2, had no lessons learned process. Companies F6 and U3 had processes in place to measure success and capture lessons learned, but made limited use of evaluation results. While company U3 measured project success at closure, there was no accountability for results and no action. In company F1, there was a reluctance to stop projects.

> *My experience in this organisation is that they do not stop a lot of projects. There would be few projects that are shut down even if they are 'off the rails'. We tend to 'throw good money after bad'. I do not see a lot of projects shut down, but I have seen a lot that should have been (Head IT Architecture, F1).*

Companies F14 and M1 experienced company inertia to change and an unwillingness to reject proposals, respectively. While some companies were improving, or intended to improve, evaluation processes they did not demonstrate systematic action that supported consistent decision making and continuous improvement. In such cases, evaluation became viewed simply as a 'box-ticking' exercise.

The evaluation was seen as a box-ticking exercise and was not used. If I did not do the project completion report, no-one would have noticed. There is no lessons learned database or other way to capture and use lessons (Project Manager, F20).

Stage gates (where funds are released in stages) and periodic reviews or health checks for larger projects were effective practices. Both processes provided the opportunity to stop projects if circumstances changed or there were significant over-runs in cost and schedule. However, a key finding of this study was that periodic reviews are not effective by themselves; they must be combined with a willingness to act. Companies that had both periodic checkpoints and a willingness to stop projects and redirect resources were most effective. Trials of projects (or 'pilot' studies) also provided a similar opportunity to test assumptions and stop projects before too many resources were committed.

Companies who used results most effectively were willing to redirect project resources based on the *a priori* understanding of the relative importance of project success criteria and were willing to stop projects. This resulted in improved project management and better use of resources. In contrast, companies such as F19 and F6 considered cancellation of a project as a failure in itself.

The company is willing to admit its failures. We use earned value management to get early visibility and avoid surprises. If we are getting a surprise then we have failed (IS Program Office Manager, M6).

The measurement of success using a post-implementation review provided the basis for lessons learned. However, only eight companies were highly effective with their use of evaluation results. In particular, most companies who had post-implementation review processes made very little use of the findings from these reviews to improve processes or learn corporately. Where lessons learned were captured, used to drive process improvement and then shared, companies reported improvements in the estimation and management of their projects. This appeared to be the result of a company 'performance' culture and not just formal processes.

The results of the post-implementation review are reviewed by the program management office and senior management for improvements and feed into the project improvement program. There is an entrenched attitude to look for

improvements and understand issues rather than hide problems or persecute the project manager (Project Portfolio Manager, F5).

In companies with effective practices, the measurement of success was rarely an end in itself. Results were used for the continuous improvement of project management and estimation, and reinforced the use of *ex-post* evaluation processes. In this sense, measuring success acts as a *self-fulfilling prophesy* in which the focus in practices drives the improvement of those practices and creates a performance (success) driven-culture.

5.11 Interrelation of Core Concepts

5.11.1 Effective Practices and Improved IT Project Evaluation Outcomes

Across the 36 companies, six key dimensions of effective IT evaluation practice were found to be related to effective IT project evaluation outcomes leading to more efficient use of resources and improved IT project success. In particular, it was when these effective practices *were combined* that positive behaviours were reinforced, actions were aligned, and evaluation processes were accurate, responsive and consistent.

Effective IT project evaluation practices were found to improve IT project evaluation outcomes, in particular accuracy, consistency and responsiveness. These outcomes were identified based on the analysis of participant descriptions of the strengths and weaknesses of company evaluation practices. Table 5.14 summarises the preceding discussion (in Sections 5.5 to 5.10) by showing which of the 13 effective IT evaluation practices on the left of Figure 5.2 affect the three IT project evaluation outcomes in the middle of Figure 5.2.

Most of the effective practices appeared to improve the accuracy of project selection, estimation and measurement, and the consistent application of processes. Seven out of the 13 evaluation practices helped with responsive decision making and action from evaluation.

Table 5.14: Summary of why effective evaluation practices work

Effective Practice	Accurate	Responsive	Consistent	Why the Effective Practice Works
Top-Leadership Commitment	X	X	X	Top-leadership commitment resulted in more consistent, accurate and timely decision making. A committed leadership team drove decision making, business engagement, a focus on performance and accountability for results.
Business Engagement	X	X	X	Business engagement was associated with a strong IT-business relationship. When the business was actively engaged the right projects were selected, estimation and scoping were more accurate and there was less politics.
Alignment to Strategy	X		X	Aligning IT investment decisions to strategy provided a consistent basis for evaluation and resulted in selection of the right projects. This also enabled the impact of projects to be traced back to company objectives.
Agreed Definition of Project Success	X		X	An agreed definition of success at the start of a project provided focus for project delivery and the measurement of results, resulting in more consistent and accurate evaluations. It also helped to manage expectations.
Portfolio Management	X		X	Visibility and control of the project portfolio led to selection of the right projects, improved alignment between projects and more efficient resource allocation. It was enabled by central funding control.
Stage Gates	X			Stage gates allowed refinement of scope and estimates, an opportunity to control resources, and the ability to stop projects. This resulted in more accurate estimates and more efficient use of resources.
Dedicated Resources	X	X	X	Dedicated resources provided the effort required to coordinate evaluation, maintain standards and improve processes. These resources improved the accuracy, responsiveness and consistency of IT project evaluation.
Standardised and Scaled Processes	X	X	X	Some level of formality was needed for consistency and to avoid excessive political activity. However, too much formality for the scale of a project resulted in delays, inefficiency and/or avoidance behaviours.
Simple and Flexible Processes		X	X	Simple and flexible processes resulted in timely decision making, and were more likely to be used and applied consistently. In contrast, bureaucratic processes led to delays, avoidance, inconsistency and wasted resources.

Continuous Measurement	X		X	Continuous measurement resulted in more consistent decision making, focused project delivery and accurate estimation. Measurement provided the basis for improvement, both of project and benefits delivery.
Integrated Evaluation Cycle	X		X	Integration between *ex-ante* and *ex-post* evaluation was achieved via consistent evaluation criteria, identification and measurement of success and benefits, and *ex-post* feedback to improve estimation and measurement.
Accountability for Results	X	X	X	Accountability for results improved the accuracy of business cases, and provided the motivation to measure results after implementation. As a result evaluation got done more accurately, responsively and consistently.
Use of Results	X	X	X	When results were used the right projects were more effectively delivered, and evaluation and delivery processes were improved through corporate learning. The use of evaluation processes was also reinforced.

The judgements behind the X's in Table 5.14 were based on both direct statements by the participants and patterns between IT evaluation practices and evaluation outcomes across companies. Overall, companies with effective IT project evaluation practices tended to describe their evaluation processes as accurate, responsive and consistent. Companies without effective practices tended to describe problems such as selection of the wrong projects, inaccurate estimation and measurement, delays in decision making, lack of focus for project delivery, limited corporate learning, political influence, avoidance or manipulation of processes, inconsistent application of processes, wasted resources, and ultimately IT project failure. Some examples will help to explain the judgements in Table 5.14.

First, a clear relationship was evident between simple and flexible evaluation practices in companies F2, F4, F10, F16 and F19 and timely decision making. In contrast, companies F7, F8, F12, F13, F20, M5, and M8 described evaluation practices that were more formal or complex and that slowed decision making. Second, where an appropriate strategy was in place, alignment to strategy helped select the right projects on a consistent basis. For example, project selection and approval processes were closely aligned to strategy in companies such as F5, F13, F18, F20, M6 and U5. Their practices contrasted with companies such F12, M3 and U2, who had issues with consistent decision making and selection of the right projects. Third,

the data suggested that evaluation was accurate when there was top-leadership commitment (F5), business engagement (F2), alignment to strategy (F1), an agreed definition of project success (F5), portfolio management (U5), stage gates (F10), dedicated resources (M6), standardised and scaled processes (F19), continuous measurement (F4), an integrated evaluation cycle (M6), accountability for results (F2), and use of results (F9).

While Table 5.14 shows pair wise relationships, it was the *combination* of the 13 effective IT project evaluation practices that resulted in the most effective outcomes. For example, standardised and scaled processes were related to all three effective IT project evaluation outcomes. However, it was only when *all* of the six key dimensions of effective IT evaluation practice were combined that IT project evaluation was *most* effective and the key challenges of evaluation were *best* addressed.

In addition, the effective IT project evaluation practices did not operate independently of each other but were also closely interrelated. For example, top-leadership commitment and an effective measurement regime were both considered necessary for accountability. Business engagement was reinforced where processes were simple and flexible (F19), there was accountability for results (F1), an agreed definition of project success (F15), top-leadership commitment (F2), alignment to strategy (F10), and a willingness to take action (F5). A feedback loop was also evident in the data. Achieving effective IT project evaluation outcomes and improved IT project outcomes appeared to reinforce practices such as top-leadership commitment and business engagement.

5.11.2 Effective Practices and Improved IT Project Outcomes

The six key dimensions of effective IT project evaluation practice were found to be related to effective IT project evaluation outcomes, and ultimately, more efficient use of resources and improved IT project success. The relationship between effective practices and improved IT project outcomes was identified based on ratings of satisfaction and confidence, and the analysis of participant descriptions of the strengths and weaknesses of their evaluation practices.

Effective evaluation practices led to more efficient use of resources at both a project and a portfolio level. For example, at a project level an agreed definition of project success, stage gates and scaled processes led to more accurate evaluation, which resulted in more efficient

use of resources. Stage gates allowed for the progressive refinement of estimates and close control of project resources. At a portfolio level, alignment to strategy, portfolio management and use of results (to stop projects), meant that the right projects were selected and sustained. A lack of visibility and control of the project portfolio led to selection of the wrong projects, duplication of projects and wasted resources. Practices that led to more responsive and consistent evaluation processes also meant that evaluation was completed more efficiently and wasteful behaviours were avoided.

The positive relationship between *satisfaction with IT evaluation processes* and *confidence that IT projects were producing business benefits* suggests a positive relationship between effective evaluation practices and IT project success. IT project success is an elusive concept that was defined in different ways by different companies. The criteria used by companies to define success were coded and grouped into three categories: project management success, technical success and business success, as Table 5.15 shows.

Table 5.15: Criteria used by the participants to judge success

Success Criteria	Category		
	Project Management	Technical	Business
On time	X		
On budget	X		
Sponsor satisfaction	X		
Steering group satisfaction	X		
Project team satisfaction	X		
Customer/user satisfaction	X	X	
Stakeholder satisfaction	X	X	
System implementation		X	
Met requirements		X	
System quality		X	
System use		X	
Business continuity			X
Met business objectives			X
Delivery of benefits			X

Companies considered between two and 11 success criteria, with an average of five. While there was a focus on the standard project management criteria of *on time* and *on budget*, 26 of these companies considered business success criteria such as *delivery of benefits*, *met business objectives* and *business continuity*. While most criteria in Table 5.15 belong to a unique category, *stakeholder satisfaction* and *customer/user satisfaction* were considered both project and technical success criteria since an element of satisfaction may be related to both the

technical result and the management of expectations by the project manager.

The results highlighted several success criteria that are rarely considered in the literature: *sponsor satisfaction*, *business continuity*, *project team satisfaction*, and *steering group satisfaction*. Business continuity referred to the level of disruption that an IT project had on business operations, including any negative impact on customers, the stopping of production or embarrassment to the company. A focus on benefits exclusively may not always pick up the unintended negative effects on the business that are covered by the business continuity criterion.

> *We sometimes may need to slip budget and schedule to ensure that there is no negative impact on operations (IS Program Office Manager, M6).*

About one-third of companies used a highly formal success construct and about one-quarter had no formally agreed success construct. Most companies considered at least one success criteria from each of the three categories, with several companies using success sliders (a visual technique, where sliding scales determine the relative importance of key criteria) or a balanced scorecard approach. Some companies also consciously split success into project management success and business success.

There was recognition in these companies that it was possible to have project management success without business success, and vice versa. Success was more than just meeting the requirements detailed in the business case. One CIO noted that if his team did not accurately capture business requirements then they may have an unhappy customer even if they met the requirements that were documented. Also, satisfying the customer, or stakeholders, may not constitute success overall if company goals have not been met. Thus, it may be possible to satisfy customers or users but not produce benefits for the company.

Ultimately, companies that had more accurate, responsive and consistent evaluation were more confident that IT projects were successful and producing benefits.

5.12 Summary

This study set out to identify the most effective IT project evaluation practices used by organisations in Australia, and to understand why they work. Based on interviews with 72 senior managers in 36 companies, effective evaluation outcomes such as accuracy, responsiveness and consistency and, improved IT project outcomes, were found to be closely related to the six key dimensions presented in Figure 5.2.

Researchers have wondered over several decades why so few of the IT evaluation methods described in the literature are used in practice. The key finding of this study is that the real problem of IT evaluation is *not* the choice of methods, nor formality of evaluation processes, but rather to ensure that effective decision making is reinforced through leadership commitment, strategic focus, resource control, continuous measurement, accountability and action. In the 36 case study companies, some level of formality helped improve evaluation and, ultimately, IT project outcomes. However, evaluation processes that were too formal were ineffective, resulting in dysfunctional behaviours. Whilst regular evaluation across the project lifecycle was the goal of most companies, the key issue was one of implementation of that intention. Many companies had well-documented processes and methods, but they were not applied consistently. Thus, formal processes and methods alone were not enough. It was only when all of the effective practices shown in Figure 5.2 were combined that those processes were *used* and so became effective.

Chapter 6 will next discuss the emerging theory in relation to the extant literature.

CHAPTER 6 MODEL DISCUSSION

6.1 Introduction

Chapter 5 detailed the findings from this study and presented an integrated model of effective IT project evaluation practice. Based on the cross-case analysis of 36 mini-case studies, six key dimensions of effective IT project evaluation were found to be related to effective IT project evaluation outcomes leading to more efficient use of resources and improved IT project success. Underlying these dimensions were 13 effective practices.

This research was not designed to test current theoretical models. This exploratory study follows a qualitative *theory-building* paradigm, where the emerging theory helps explain what is happening in practice. Accordingly, the data collection focused on how companies approach IT project evaluation in practice rather than seeking confirmation of specific components of existing theoretical models. An essential feature of theory building is comparison of emergent theory with the extant literature to enhance internal validity (Eisenhardt 1989; Dube & Pare 2003).

This chapter aims to discuss the emerging theory in relation to the extant literature detailed in Chapter 2. The chapter is organised as shown in Figure 6.1.

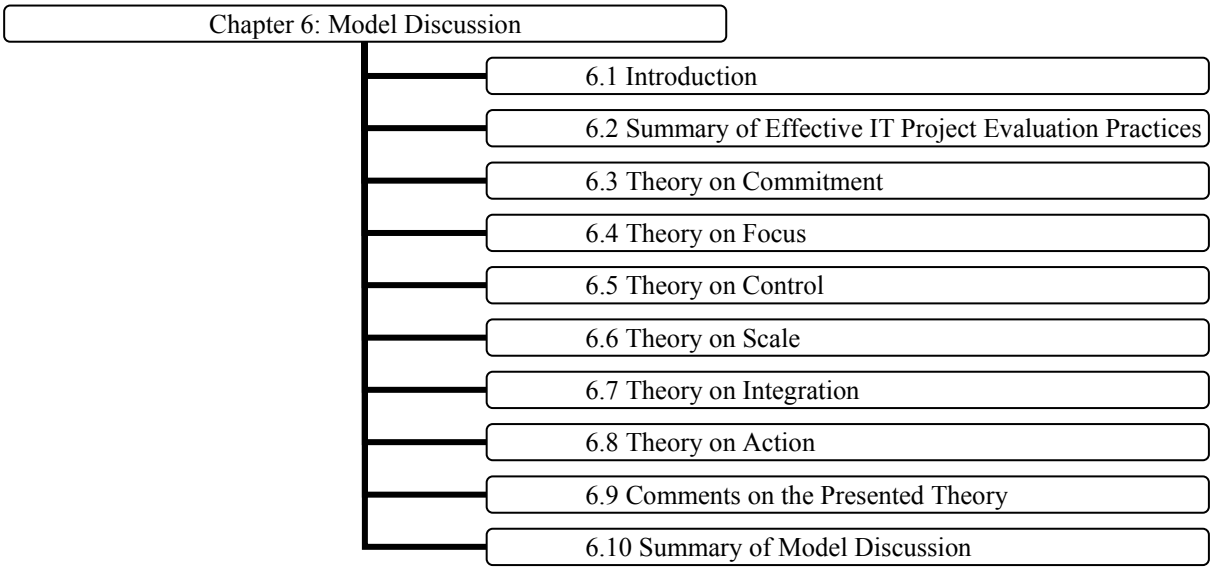

Figure 6.1: Chapter 6 outline

6.2 Summary of Effective IT Project Evaluation Practices

The review of IT evaluation literature in Chapter 2 showed that while there is extensive research on IT project evaluation methods and challenges, there is limited understanding of which evaluation practices are most effective and why they are effective. The review identified a number of important gaps in the literature. First, there is very little research on what constitutes an appropriate level of formality or rigour, or what specific practices are necessary for evaluation to be effective. Second, there is limited research on *ex-post* evaluation and the integration of evaluation practices across the project lifecycle. Finally, few studies agree on how project success is defined and the relationship between specific evaluation practices and IT project success.

There has been little recognition to date of effective IT project evaluation practices. The literature review identified a scattering of effective IT project evaluation practices, such as the alignment of evaluation criteria to strategy and the involvement of a range of stakeholders. However, there was limited integration of these concepts and no clear guidelines for practitioners about what practices are *most* effective and *how* to improve evaluation practices. As a result, there is still a significant gap between academic theories and actual evaluation practice (Serafeimidis & Smithson 2003). This study aimed to address this gap.

The theoretical model presented in Chapter 5 identified six key dimensions of effective IT project evaluation practice: commitment, focus, control, scale, integration and action. These dimensions were found to be associated with more accurate, responsive and consistent evaluation, and improved IT project outcomes. While these concepts may be discussed in isolation in the extant IT project management literature few studies present them in an integrated manner and relate them to effective IT project evaluation outcomes and IT project success. A summary of effective IT project evaluation practices found in this study is shown in Table 6.1.

Table 6.1: Summary of effective IT project evaluation practices

Dimension	Effective Practice	Key Points
Commitment	Top-Leadership Commitment	Involvement from the business at executive level; Cohesive buy-in and support; A focus on performance and accountability from the top-down
	Business Engagement	IT projects managed as business projects; Driven from the business; Shared responsibility; A strong IT-business relationship
Focus	Alignment to Strategy	Investments aligned to company strategy and objectives; Projects driven from the strategy; Ideas tested for strategic alignment
	Agreed Definition of Project Success	Formal success criteria agreed at the start of a project; A clear distinction between project management success and business success; Management of the project according to the agreed definition of success; A focus on the delivery of benefits
Control	Portfolio Management	Decision making within the context of a portfolio of projects; Visibility of all projects in the portfolio; Active management of the portfolio; Enabled by a single point of (central) funding control
	Stage Gates	Used to approve project stages and control funding; Progressive refinement of estimates
	Dedicated Resources	Used to coordinate evaluation processes, maintain quality standards, provide independent reviews and improve processes; Specialist evaluation skills
Scale	Standardised and Scaled Processes	Standardised evaluation processes; Scaled to the project, usually based on financial value; Processes are formal but not too formal; Roles are clearly defined.
	Simple and Flexible Processes	Simple processes are used and applied with flexibility; Evaluation processes are not too rigid, complex or bureaucratic
Integration	Continuous Measurement	Project success is consistently measured; Baseline measurement of benefits, an update at closure and measurement of results; Project measurement is integrated with company measurement; Enabled by a robust company measurement system
	Integrated Evaluation Cycle	*Ex-ante* and *ex-post* evaluation integrated across project lifecycle; Full benefits realisation process, including benefits plan; Review of delivered benefits 6–12 months after implementation (or until realised)
Action	Accountability for Results	Managers are accountable for results; Results are measured against performance targets at both the project and company level
	Use of Results	Evaluation forms the basis of action; Evaluation results are actively used for decision making and accountability; A willingness to stop and redirect projects; A focus on learning and continuous improvement

6.3 Theory on Commitment

The first dimension of effective IT project evaluation practice was commitment. This study found that evaluation practices were most effective when there was top-leadership commitment and business engagement. Both collaboration between stakeholders and senior management support at the highest level are advocated in the literature as effective practices (Renkema 1998; Wilson & Howcroft 2005). For example, Meador et al. (1984) found that senior management involvement was a critical factor in the IT project approval process. Top management support has also been identified as a critical success factor for benefits realisation (Karlsen 2008).

Prior literature emphasises the importance of senior management support and involvement for the success of IT governance (Luftman et al. 1999; Ali & Green 2005; Bowen et al. 2007). Senior management involvement is important due to the magnitude of expenditure involved, the impact of IT on the business and evidence of wasted resources when they are not involved (Jarvenpaa & Ives 1991). The willingness of senior business managers to be involved with IT functions has been attributed to the status of IT in the company (Avison et al. 1999). This status impacts on how IT is funded and the way in which IT projects are justified (Avison et al. 1999). In turn, status is impacted by the IT-business relationship, history of IT project success, and the ability to measure and market the IT function (Avison et al. 1999; Reich & Benbasat 2000).

Weill and Broadbent (1998) recommend joint responsibility for investment decision making. However, in practice the IT department is often responsible for IT project evaluation (Ballantine et al. 1996b; Lin & Pervan 2003). The evaluation process may be further complicated by relationship issues between IT and the business (Ward & Peppard 1996; Peppard & Ward 1999). A strong relationship between IT and the business, based on mutual respect and trust, is necessary for IT and the business to work together effectively on projects (Chan 2002; Piccoli & Ives 2005). Thus, it follows that a strong IT-business relationship supports business engagement and is beneficial for effective evaluation of IT projects.

In summary, the finding that top-leadership commitment and business engagement are related to effective evaluation is consistent with the extant literature. Further, this study suggests that the level of commitment is influenced by the importance of IT to core business operations and the level of IT expenditure relative to the overall company budget. Achieving effective IT

project evaluation outcomes and improved IT project outcomes through effective practices such as continuous measurement also reinforces this commitment.

6.4 Theory on Focus

The second dimension of effective IT project evaluation practice was focus. A clear focus was achieved during *ex-ante* evaluation by aligning projects to strategy and having an agreed definition of project success. The need to align IT investments to business strategies is generally agreed (Goldsmith 1991; Reich & Benbasat 1996; Teo & King 1997; Segars & Grover 1998). However, few studies have examined the implications of defining and measuring project success on project outcomes.

Strategic alignment positively influences IT effectiveness (Galliers 1991; Cragg et al. 2002). According to Alshawi et al. (2003), IT projects should be aligned and driven from a corporate strategy, particularly given the qualitative nature of many IT benefits. Thus, realisation of IT project outcomes is considered partly a function of alignment with an organisation's business strategy (Tallon et al. 2000; Willcocks & Graeser 2001). Some authors also suggest that strategic alignment reinforces the status of IT in the organisation and commitment from senior management (Chan & Huff 1992). Others suggest that it is the level of communication between business and IT executives, and the level of top-leadership commitment to IT, that influence the level of strategic alignment (Teo & Ang 1999; Reich & Benbasat 2000; Avison et al. 2004).

While the need for strategic alignment is generally agreed, there are few empirical studies of how organisations achieve alignment (Smaczny 2001). This has led to calls for further research into alignment, especially the practicalities of its achievement (Avison et al. 2004). This study provides new insights by distinguishing two ways in which strategic alignment can be achieved. At the highest level, those companies with effective evaluation practices *drove* IT-related investments from the strategic plan. A lower level of still-positive alignment occurred if a project came up out of the planning cycle and was evaluated against strategic fit or the existing strategies. In such cases, the project was not driven by the strategy, but was identified and then was tested against the strategy.

Although there is extensive literature on the topic of IT project success, few studies have examined how project success is defined in practice, and the implications of defining and

measuring success on project outcomes. Success and failure are difficult to define and measure since they mean different things to different people. However, success is also a concept that is critical when trying to foretell the future of projects (Christenson & Walker 2004). Although IT project failure is considered widespread (Lubbe & Remenyi 1999; Love et al. 2005), there is no commonly agreed definition of success and failure (Irani et al. 2001; Wilson & Howcroft 2002). A key finding of this study is that companies who clearly define the elusive concept of IT project success have a greater chance of achieving success.

The difficulties with defining success mean that many projects are initiated without a clear statement of what will be regarded as success (Remenyi & Sherwood-Smith 1999). Conversely, having an inspiring vision of what the project is meant to achieve is in itself a significant driver of project management success (Christenson & Walker 2004). Thus, negotiating a definition of success among key stakeholders before the start of a project and at several review points during the project's lifecycle has been recommended as a good project management practice (Jugdev & Muller 2005). This study found that there was no one best method for defining and measuring success. However, companies that did so effectively used a balance of success criteria, clearly distinguishing project management success from business success. These companies agreed on the definition of success before a project and focused on the delivery of benefits to the company.

In summary, the need to align IT investments to strategy is well documented and consistent with the findings of this study. It is logical that projects aligned to organisational goals are allocated IT resources. This study also provides additional insights into the practicalities of achieving this alignment. With respect to project success, this study provides new insights by examining how project success is defined in practice. A key finding of this study is that establishing a commonly agreed definition of project success during *ex-ante* evaluation contributes to project success itself. In this sense, defining project success acts as a *self-fulfilling prophecy* (Merton 1948) in which the focus in practices drives the improvement of those practices and results in improved project success.

6.5 Theory on Control

The third dimension of effective IT project evaluation practice was control. Control at both a project and portfolio level was enabled by stage gates, portfolio management and dedicated resources. It has been suggested that one of the primary purposes of evaluation is control

(Farbey et al. 1999b). Control is often associated with central decision-making authority, which provides for the implementation of uniform controls and practices (King 1983). This allows management to control adherence to standards and reduces the likelihood of wasted resources (King 1983). Elements of evaluation control provide order and mechanisms for the organisational success of IT investments (Symons 1993; Ballantine & Stray 1999). Further, communication and sense-making between stakeholders is enabled by a common evaluation language, which is facilitated by these control elements (Serafeimidis & Smithson 2003).

One of the reasons that organisations evaluate IT projects is to compare and rank different projects to control capital rationing (Remenyi & Sherwood-Smith 1999; Irani & Love 2002). Consistent with the findings of this study, adopting a centralised view of the portfolio and ongoing optimisation of the portfolio are considered effective practices (Reyck et al. 2005). For example, Reyck et al. (2005) correlated project portfolio management adoption with the benefits perceived from projects, and found increased adoption has a significant positive impact on the return of projects in the portfolio. Cooke-Davies (2002) also suggests that portfolio management leads to successful projects by allowing projects to be resourced that are matched to corporate strategy and objectives. Thus, some form of project prioritisation is seen as vital to the overall strategic alignment process (Avison et al. 2004).

While stage gates are well known in new product development (Cooper & Kleinschmidt 1993), there appears to be very little academic research on their use in the IT/IS field. The impact of dedicated evaluation resources, such as customer relationship managers and PMOs, also receive limited treatment. While there is literature on the role of PMOs in relation to supporting project management standards (Dai & Wells 2004), the literature does not focus specifically on their role in supporting evaluation practices. This study demonstrates that it is not just the presence of dedicated resources but the roles and responsibilities adopted, and specialist evaluation skills, that impact on the effectiveness of evaluation practice. Dedicated resources contributed to the effectiveness of evaluation when they were used for understanding business requirements, managing the portfolio of projects, capturing and sharing knowledge, building evaluation expertise, coordinating evaluation processes, maintaining evaluation standards and conducting independent reviews. PMOs that were used only to manage project guidelines and standards did not contribute to more effective IT project evaluation practice.

Control as a concept is commonly discussed in the IT/IS literature. There is past research on central decision making and the use of portfolio management practices to control resources. However, there is limited reference to stage gates and dedicated evaluation resources as mechanisms for control. This study provides some new insights into these effective evaluation practices.

6.6 Theory on Scale

The fourth dimension of effective IT project evaluation practice was scale. Effective evaluation processes were scaled to balance governance and responsiveness. However, most of the prevailing research supports the view that the use of more formal IT project evaluation methods and processes are generally related to more effective evaluations (Ward 1990; Farbey et al. 1993; Renkema 1998; Irani & Love 2002). There is very little research on what constitutes an appropriate level of formality or rigour, or what specific practices are necessary for evaluation to be effective. According to Ballantine et al. (1996b, p.139), 'the role of formal procedures in the IS/IT evaluation process needs to be more closely examined to identify whether their use results in any significant benefits'.

Researchers have wondered over several decades why so few of the IT evaluation methods described in the literature are used in practice. The key finding of this study is that the real problem of IT evaluation is *not* the choice of methods, nor formality of evaluation processes, but rather to ensure that effective decision making is reinforced through leadership commitment, strategic focus, resource control, continuous measurement, accountability and action. While some level of formality helped improve evaluation, processes that were too formal resulted in dysfunctional behaviours. Whilst regular evaluation across the project lifecycle was the goal of most companies, the key issue was one of implementation of that intention. Many companies had well-documented processes and methods, but they were not applied consistently. Thus, formal processes and methods alone were not enough. It was only when appropriately scaled evaluation processes were combined with the other dimensions of effective practice that positive behaviours were reinforced, actions were aligned, and evaluation processes were used effectively.

It is generally agreed in the literature that specific evaluation processes and methods should be matched to different projects (Farbey et al. 1992; Smithson & Hirschheim 1998; Irani 2002). However, this research found that evaluation was most effective when processes were

simple and standardised. Companies with the most effective evaluation practices tended to scale the level of governance and the formality of evaluation processes, generally based on the financial value of the IT project. Although flexibility in the application of these processes allowed for different project types, having too many different processes and methods was less effective. Too many variations complicated evaluation and led to inconsistent application of evaluation processes.

In summary, the key finding of this study is that more formal evaluation is not necessarily better. Evaluation was most effective when processes were scaled to balance governance and responsiveness. This provides important insights into the role of formal procedures for IT project evaluation. In addition, this finding suggests future research aimed at improving evaluation practice should focus on the context of evaluation processes rather than specific methods and techniques.

6.7 Theory on Integration

The fifth dimension of effective IT project evaluation practice was integration. Evaluation was effective when there was continuous measurement, and integration between *ex-ante* and *ex-post* evaluation. Identification and measurement of IT costs and benefits is one of the most important and widely discussed topics in the IT/IS evaluation literature (Willcocks 1992; Ballantine et al. 1996b; Seddon et al. 2002). However, there is limited research on *ex-post* evaluation and the integration of evaluation practices across the project lifecycle (Beynon-Davies et al. 2004; Al-Yaseen et al. 2006).

This study found that evaluation was most effective when there was continuous measurement of IT projects integrated with a robust company performance-measurement system. The process of continuous measurement included as a minimum: baseline measurement, an update at closure and the measurement of results. The use of a performance-measurement system provides management with a view of how IT projects are performing (Hardy 2002). According to Cooke-Davies (2002, p.188), projects are more consistently successful when there is a suite of project, program and portfolio metrics that provide 'feedback on current project performance, and anticipated future success, so that project, portfolio and corporate decisions can be aligned'. Thus, performance-measurement systems provide the means to improve governance, strategic alignment and accountability.

One of the main challenges associated with evaluation of IT projects is the identification and measurement of benefits (Irani 2002). However, for effective evaluation it is important that all relevant costs and benefits are identified and measured, including intangibles (Ward 1990; Irani et al. 2006). Remenyi et al. (2000) suggest that project benefits without performance indicators are of little value and that virtually all benefits are measurable, even intangible ones. The theory that emerged from this study supports this view. In addition, when a robust company performance-measurement system was in place, linked to strategy, the process of measuring project benefits was enabled and thus made easier.

Evaluation should be viewed as a continuous interactive process to allow learning to occur and reduce the risk of project failure (Remenyi & Sherwood-Smith 1999; Serafeimidis & Smithson 1999). Consistent with the findings of this study, previous research has shown that post-implementation review and benefits realisation are rarely carried out despite the perceived value of these practices (Irani 2002; Lin et al. 2005). However, there is very little said about the interaction between *ex-ante* and *ex-post* evaluation processes, or how integration is achieved (Beynon-Davies et al. 2004). This is not surprising given the lack of research on *ex-post* evaluation (Remenyi & Sherwood-Smith 1999; Al-Yaseen et al. 2006). This thesis provides new insights into the conduct of *ex-post* evaluation and the degree of integration with *ex-ante* evaluation processes. Companies who effectively integrated evaluation across the project lifecycle employed monitoring and feedback mechanisms for continuous effect. These companies had a full benefits realisation process that included the identification of benefits in the business case and a review of delivered benefits six to 12 months after implementation (or until realised).

In summary, the identification of continuous measurement and an integrated evaluation cycle as effective evaluation practices is consistent with earlier studies. However, there has been little or no recognition to date about the interaction between *ex-ante* and *ex-post* evaluation processes, or how integration is achieved. This study provides some further insights into these practices, and in particular *ex-post* evaluation.

6.8 Theory on Action

The sixth, and final, dimension of effective IT project evaluation practice was action. The use of evaluation results and accountability reinforced the effectiveness of evaluation practices. While the uses of evaluation are well documented, little empirical research exists about the

willingness to take action from evaluation results. Moreover, accountability and responsibility for IT investments is identified as an area requiring further research (Ballantine et al. 1996b).

There are mixed opinions about accountability in the literature. Accountability is often cited as an important element of IT project evaluation and IT project success (Danks 1997; Gunasekaran et al. 2006). For example, Serafeimidis and Smithson (2000) found that the lack of integration of evaluation with appropriate cultural and structural foundations for supporting accountability and corporate learning helped explain the limited adoption of evaluation approaches in a large utility company. Establishing accountability and ownership is also seen as a benefit derived from evaluation (Irani 2002; Seddon et al. 2002). However, Farbey et al. (1999b, p.249) argue that in a rapidly changing environment, 'there is little point in holding people to account for a situation beyond their control and which may no longer be relevant'. Evaluation should be a collective tool of management and not be treated as a way to hold people accountable (Renkema 1998). Also, managers may seek to avoid evaluation and accountability due to the potential for negative results and embarrassment (Gwillim et al. 2005).

The use of evaluation results for various purposes, such as corporate learning and continuous improvement is well established (Cooke-Davies 2002; Irani & Love 2002). However, the willingness to *use* evaluation results has received limited treatment in the extant literature. This study found that evaluation results must be actively used for decision making, stopping and redirecting projects, corporate learning and continuous improvement in order to be effective. The effective use of evaluation results was not only associated with the continuous improvement of evaluation processes, but also reinforced their use. Thus, evaluations should form the basis for action (Hedman & Borall 2004). Newman and Sabherwal (1996) isolate three important decisions by senior managers: initial commitment, withdrawal of commitment and commitment to a new approach. However, the degree to which organisations are willing to make these decisions and use evaluation results is rarely addressed.

This study found that accountability for results drives *positive* behaviours that ultimately lead to more efficient use of resources and improved IT project outcomes. Accountability was a central concept in the model of effective evaluation practice. This study also provides new insights into how accountability is achieved through formal project reporting, performance incentives, individual appraisals and department budgets. In addition, while specific uses of evaluation are found in the literature, the willingness to use evaluation results is not explicitly

addressed. The use of results was influenced by structures, processes and culture, and is a suggested area for further research.

6.9 Comments on the Presented Theory

There are many different perspectives on theory and many criteria for good theory. At a general level, Gregor (2006, p.616) defines theory as 'abstract entities that aim to describe, explain, and enhance understanding of the world and, in some cases, to provide predictions of what will happen in the future and to give a basis for intervention and action'. Good theory guides research and, when applied, increases the likelihood that IT will be employed more effectively (Marcus & Robey 1988). According to (Davis 1971), a good theory is one that is 'interesting', in that it denies *some* assumptions of the audience and thus will attract attention.

This exploratory study follows a *theory-building* paradigm. Mini-case studies were conducted in 36 companies in three industry sectors. Data and coding techniques borrowed from the grounded theory methodology were used for conceptualisation and the approach adopted allowed an exploration of project evaluation grounded in rich empirical data. The criteria for assessing a theory are dependent on how the theory was generated (Glaser & Strauss 1967). A strong theory-building study is one that yields a theory that is parsimonious, testable, logically coherent, fits with the data and provides new insights (Eisenhardt 1989).

Parsimony is preference for the least complex explanation for an observation—simple explanations are better than complex ones. The theoretical model presented in Chapter 5 distilled over 500 codes into six central codes representing 13 effective evaluation practices. The outcomes of effective evaluation were also grouped and refined into five central codes. These central codes were used to develop a parsimonious model sufficiently saturated with theoretical meaning to explain the core patterns of effective evaluation practice. According to Glaser and Strauss (1967), the process of reduction achieves both parsimony and scope in the applicability of the theory to a wide range of situations.

Testability is the ability to prove or test the correctness of the proposed theory in other contexts. Abstraction and generalisation about phenomenon are thought to be at the core of a theory (Gregor 2006). The findings from this exploratory study are based on empirical evidence from 36 companies in three industries in Australia. The model presented provides the basis for further testing to validate, extend or falsify the theory presented. Six key

dimensions of effective IT project evaluation are related to effective IT project evaluation outcomes and improved IT project outcomes. Each construct in the model and the relationships between them are supported by rich descriptions and examples. In addition, details of the context of the companies and exceptions to the theory provide useful insights for generalisation.

The model presented in this thesis is a logically coherent substantive theory. The objective of this thesis was to develop a plausible account of effective evaluation practice that ties together data from multiple cases in a coherent and meaningful fashion. A 'logical structure in theory refers to the nature of the relationship between elements identified as antecedents and those identified as outcomes' (Markus & Robey 1988, p.595). The theory of effective IT project evaluation practice presented identifies *necessary* and *sufficient* conditions for effective IT project evaluation outcomes and improved IT project outcomes to occur. Thus, the model achieves a balance of comprehensiveness and parsimony (Whetten 1989).

This thesis followed systematic procedures to achieve a good fit between evidence and theory. As described in Chapter 3, the credibility of this research is supported by the approach that has been adopted to establish construct validity, internal validity, external validity and reliability. Data and coding techniques borrowed from the grounded theory methodology were used for conceptualisation (Glaser & Strauss 1967; Glaser 1978). This allowed an exploration of project evaluation grounded in rich empirical data (Orlikowski 1993). This approach was desirable because it aligned well with the need to achieve relevance and to conduct rigorous qualitative research (Fernández & Lehmann 2005). Thorough reporting also gives confidence that a theory is valid (Eisenhardt 1989). This thesis provides detailed evidence for each construct of the theory and a logical chain of evidence from the data on which it is grounded.

Finally, theory-building research should result in new insights (Eisenhardt 1989). A good theory is practical when it advances scientific knowledge, guides research to critical questions and contributes to enlightening professional practice (Van de Ven 1989). This thesis aimed to provide a substantive theory of how to improve IT project evaluation practice. In achieving this aim, the thesis has highlighted several new insights and extensions to existing knowledge, as described in this chapter. These insights provide guidance for new research and are focused on improving IT project evaluation practice. The theory developed is one that both 'explains' and 'predicts'; describing theoretical constructs and relationships, and improving understanding of underlying causes (Gregor 2006). The ultimate utility of the theory will be

demonstrated by how interesting it is to the academic community and its uptake by practitioners. Further discussion about the contribution of this research is provided in Chapter 7.

6.10 Summary of Model Discussion

This chapter provided a comparison of the research findings to the literature. The theoretical model presented in this thesis identified six key dimensions of effective IT project evaluation practice and 13 underlying effective practices. The model, developed from practice, reflects components of current theory; however, there are key elements that are new and are not fully reflected in theory. There are also elements of theory identified that are not reflected in practice, such as matching specific evaluation processes and methods to different projects.

This research provided new insights into effective evaluation practices. Many of the effective practices, such as top-leadership commitment and alignment to strategy, are strongly supported by the literature. However, there appears to be limited IT/IS research on evaluation practices such as an agreed definition of project success, stage gates and dedicated resources. Contrary to the existing literature, this study found that more formal evaluation is not necessarily better. Evaluation was most effective when there was a balance of governance and responsiveness. Further, accountability for results was found to be an effective practice despite differing opinions on this subject in the literature. Thus, this research builds on existing knowledge of effective evaluation practices and how they work.

This study identified effective IT project evaluation practices and related them to effective IT project evaluation outcomes and IT project success. The study adopted an integrated approach to understanding and explaining effective evaluation practice. While none of the individual parts of the model is fundamentally new, the aggregation of these concepts into a model of effective IT evaluation practice *is* new. When all of the effective practices were combined evaluation was *most* effective. By identifying what practices are effective, this study provides a framework for improving IT project evaluation practice.

CHAPTER 7 CONCLUSIONS AND IMPLICATIONS

7.1 Introduction

The aim of this study was to contribute new knowledge to what is known about IT project evaluation and to produce a theory for improving IT project evaluation practice. This topic is important due to the high cost and strategic importance of many IT projects, and long-standing difficulties with their evaluation. To date there has been no comprehensive and systematic research into what practices are necessary for IT project evaluation to be effective and why they work.

A series of 36 mini-case studies was conducted in three industries in Australia in an effort to gain a better understanding of which IT project evaluation practices are being used today, their relative effectiveness, and what value they bring. Based on interviews with 72 senior managers, the study found that both (a) effective IT *project evaluation* outcomes and (b) improved *IT project* outcomes were closely related to six key dimensions, namely, commitment, focus, control, scale, integration and action. Underlying these dimensions were 13 effective practices.

The contribution of this thesis is an integrated model for improving IT project evaluation and the finding that desired evaluation outcomes were more closely related to the drivers of evaluation *behaviour* in organisations than the use of specific methods and techniques. Further, it was when these effective practices *were combined* that positive behaviours were reinforced, actions were aligned, and evaluation processes were *most* effective. These conclusions provide important insights for improving IT evaluation practices, and ultimately, IT project outcomes, both in Australia and around the world.

This chapter discusses the major findings and implications of the research. This final chapter is organised as shown in Figure 7.1.

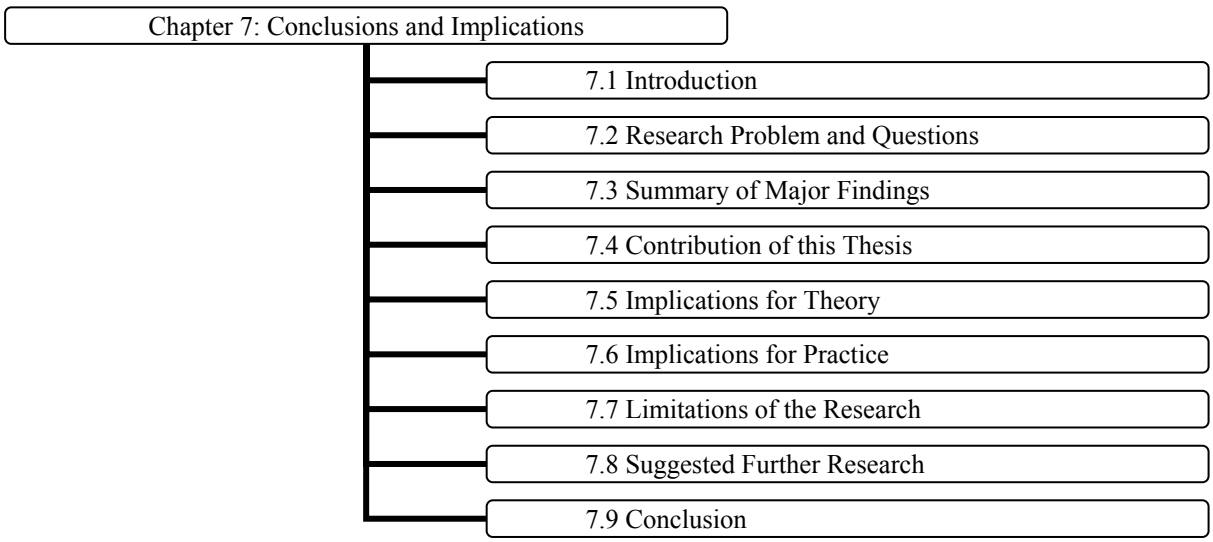

Figure 7.1: Chapter 7 outline

7.2 Research Problem and Questions

The objectives of this research were:

1. To contribute to theory by building a framework explaining IT project evaluation; and
2. To assist organisations to improve the evaluation of IT projects by identifying effective practices.

The primary research question was as follows:

How can organisations improve the evaluation of IT projects?

To achieve this aim, four sub-questions were also posed:

1. How do organisations evaluate IT projects?
2. To what extent do organisations formally evaluate IT projects and why?
3. How do organisations define IT project success?
4. What are the most effective IT project evaluation practices used by organisations and why are they effective?

In addressing the research questions, this thesis was divided into seven chapters. The first three chapters established the basis for the research problem, questions and approach. Chapter 1 set the scene and outlined the structure of the thesis. Chapter 2 summarised the literature on IT project evaluation, project success and effective evaluation practices. The literature review identified gaps in the literature, and provided the rationale for the research objectives and

questions. Chapter 3 then described the research method and demonstrated a rigorous approach to the study. The credibility of this research is supported by the approach that has been adopted to establish construct validity, internal validity, external validity and reliability.

The next three chapters addressed the research problem and questions, through presentation and analysis of the case study data. Chapter 4 provided an overview of the results and descriptions of the evaluation practices in each of the case study companies. The case summaries provide valuable insights into *how* IT project evaluation is done in practice in 36 companies, addressing sub-questions 1, 2 and 3. Chapter 5 presented the cross-case analysis and described the emergence of a new theoretical model for improving IT project evaluation practices. This chapter addressed the primary research question, and sub-questions 3 and 4. Detailed evidence was provided for each construct of the theory and the thesis as a whole demonstrates a logical chain of evidence from the data on which it was grounded. Chapter 6 then discussed the emerging theory in relation to the extant literature, identifying components of current theory and key elements that are new.

In conclusion, this chapter summarises the major findings of this study in relation to the research problem and questions.

7.3 Summary of Major Findings

Companies are uncertain as to what value they are getting from IT projects. The literature review in Chapter 2 revealed that while the problems with evaluating IT projects are well documented, the solutions proposed in the literature do not appear to be adopted in practice. Therefore, new methods and techniques suggested by researchers appear to have had a limited impact on improving IT project evaluation practice. The failure to improve the evaluation of IT projects contributes to their high failure rates. Thus, there is a need for further research into *how* organisations can improve the evaluation of IT projects.

The contribution of this study is an integrated model for improving IT project evaluation. Based on data from 36 case study companies, effective IT project evaluation outcomes and improved IT project outcomes were found to be closely related to six key dimensions: commitment, focus, control, scale, integration and action. First, evaluation was effective when there was commitment from senior leaders and the business. Second, a clear focus was achieved during *ex-ante* evaluation by aligning projects to strategy and having an agreed

definition of project success. Third, control at both a project and portfolio level was enabled by stage gates, portfolio management and dedicated resources. Fourth, effective evaluation processes were scaled to balance governance and responsiveness. Fifth, evaluation and measurement were continuous and integrated. Finally, the use of evaluation results and accountability reinforced the effectiveness of evaluation practices.

The key finding of this study is that more formal evaluation is not necessarily better. In the 36 case study companies, some level of formality helped improve evaluation and, ultimately, IT project outcomes. However, evaluation processes that were too formal were ineffective, resulting in dysfunctional behaviours. Whilst regular evaluation across the project lifecycle was the goal of most companies, the key issue was one of implementation of that intention. Many companies had well-documented processes and methods, but they were not applied consistently. Thus, formal processes and methods alone were not enough. It was only when all of the effective practices identified in Chapter 5 were *combined* that evaluation processes were accurate, responsive and consistent leading to more efficient use of resources and improved IT project success.

7.4 Contribution of this Thesis

This study contributes new knowledge with respect to:

1. What is known about IT project evaluation;
2. Understanding of IT project success;
3. Understanding of the relationship between IT project evaluation and project success; and
4. Researchers' understanding of current evaluation practices.

The literature is lacking in substantive theories of effective IT project evaluation practice grounded in empirical data (Serafeimidis & Smithson 2000). To the best knowledge of the researcher there has been no comprehensive and systematic research into what practices are necessary for IT project evaluation to be effective and why they work. While these concepts may be discussed in isolation in the extant literature, few studies present them in an integrated manner and relate them to effective IT project evaluation outcomes and IT project success.

This study adopted an integrated approach to understanding and explaining effective evaluation practice. The study identified effective IT project evaluation practices and related them to effective IT project evaluation outcomes and IT project success. The major

contribution of this study is an integrated model for improving IT project evaluation, and the finding that effective evaluation outcomes are more closely related to governance structures and the reinforcement of behaviours than specific methods and techniques. While some level of formality helped improve evaluation, processes that were too formal resulted in dysfunctional behaviours. It was only when scaled processes were combined with commitment, focus, control, integration and action that positive behaviours were reinforced, actions were aligned, and evaluation processes were used effectively. These conclusions provide both theoretical and practical insights into the evaluation of IT projects in complex environments.

This research builds on existing knowledge of effective evaluation practices and how they work. In summary, the specific contributions of this thesis include:

- Insights into how organisations evaluate IT projects;
- Identification of the most effective IT project evaluation practices;
- Clarity around what constitutes an appropriate level of formality or rigour;
- Confirmation that top-leadership commitment and business engagement are necessary for effective evaluation practice;
- Additional insights into the practicalities of achieving strategic alignment of IT projects;
- The finding that establishing a commonly agreed definition of project success during *ex-ante* evaluation contributes to project success itself;
- Confirmation that adopting a centralised view of the portfolio and ongoing optimisation of the portfolio are effective practices;
- New insights into stage gates and dedicated resources as effective evaluation practices;
- A deeper understanding of *ex-post* evaluation and the integration of evaluation practices across the project lifecycle;
- Confirmation that continuous measurement of IT projects integrated with a robust company performance-measurement system is an effective practice;
- A richer understanding of accountability, its central role in effective evaluation practice and how accountability is achieved;
- Identification of the use of results as an effective evaluation practice and an area for further research;
- Improved understanding of how IT project success is defined in practice; and

- Identification of an explicit relationship between IT project evaluation practices, effective IT project evaluation outcomes and IT project success.

The research outcomes from this study provide an important contribution to understanding how IT project evaluation is conducted and how it can be improved. The proposed framework for improving the effectiveness of project evaluation practices in an organisation is a new model that extends upon current theory. The models principal attributes are that it accounts for gaps between current theory and practice, addresses both *ex-ante* and *ex-post* evaluation, integrates effective practices with IT project success and is designed using high-level concepts with broad applicability.

This research contributes to improving IT evaluation practices, and ultimately, improving IT project outcomes. In particular, improvements to the evaluation of IT projects may lead to more efficient use of resources and improve the rate of IT project success. The practices identified in this study also provide the foundation for further research into IT project evaluation practices, and the relationships between project evaluation practices and project success.

7.5 Implications for Theory

This research contributes to theory development by presenting a substantive theory of effective IT project evaluation grounded on rich empirical data. The theoretical model developed addresses important gaps in the literature, in particular by identifying which practices are most effective, integrating a range of concepts and relating effective practices to IT project success. This contribution is important due to the lack of recognition to date of effective IT project evaluation practices. The model presented in this thesis provides the basis for further testing to validate, extend or falsify the theory presented.

Most of the prevailing research supports the view that the use of more formal IT project evaluation methods and processes are generally related to more effective evaluations. A key finding of this study is that more formal evaluation is not necessarily better. This finding suggests future research aimed at improving evaluation practice should focus on the context of evaluation processes rather than specific methods and techniques. Thus, this study provides an important opportunity to re-frame academic thinking from problems, methods and criteria to a more holistic examination of IT evaluation.

The findings from this exploratory study are based on empirical evidence from 36 companies in three industries in Australia. The case-based study explored real-life projects in order to achieve conceptualisations grounded in professional practice, not to achieve generalisation. Yet, since the companies in this study are a diverse range of organisations by size, focus of operations (state, national and international), and ownership (public, private, government, and international); and the practices identified are related to management issues known to be important the world over, the findings could apply to other organisations due to the 'representativeness' of the sample (Seddon & Scheepers 2006) and the level of abstraction (Glaser 2001).

7.6 Implications for Practice

The research outcomes provide a basis for understanding how the evaluation of IT projects can be improved. By identifying what practices are effective, this study provides a model for improving IT project evaluation practice. The intent is to extend this model into a framework for assessing the effectiveness of an organisation's evaluation practices. Comparing the current state assessment with leading evaluation practice provides a starting point for identifying improvement strategies. Improvement actions would be specific to each company and address elements of the model based on the assessment for that company. The model would also provide a means for regularly assessing progress on the journey towards leading IT project evaluation practice.

The integrated nature of the model needs to be recognised during any efforts to improve IT project evaluation practice. The effective IT project evaluation practices did not operate independently of each other but were closely interrelated. Addressing dimensions or practices in isolation *may* help to improve IT project evaluation. However, it was only when *all* of the six key dimensions of effective IT evaluation practice were combined that IT project evaluation was *most* effective. Ideally, the elements of the model need to be addressed together while recognising the interrelationships between them.

This research has clear implications for practitioners seeking to implement or improve IT project evaluation practices. By focusing on the dimensions of effective practice identified, they are likely to have greater chances of IT evaluation, and ultimately IT investment, success.

7.7 Limitations of the Research

This study is limited in several ways. First, for six of the 36 participant companies, only one person was available for interview. While single participants were interviewed twice to cover both parts of the interview format, the ability to explore divergent views was limited in these cases. In these cases, the researcher relied on a single perspective and used company documents relating to project management and evaluation practices for contextual, informational and triangulation purposes.

Second, this study is limited in its sampling strategy as one may expect bias in the self-reported performance of the interviewed CIOs, program managers and project managers, given their role as providers of IT projects to the company. Glaser (1978) calls this reporting behaviour *proper-lining*, that is the tendency to provide a version of events that suits expectations of how *others* should perceive the reporting person or the organisation. Being aware of this limitation, the researcher maintained openness and scepticism, triangulating the views of the interviewees within each company whenever possible and seeking further evidence from their documents. No significant evidence of proper-lining was found in the data. In contrast, those interviewed were willing to discuss openly failures and problems with their evaluation practices. A possible explanation to this behaviour is that the interviewer was perceived as an expert, leading participants to feel that they were talking to a peer who could understand their problems, and the conversational nature of the semi-structured interviews.

Third, researcher bias is acknowledged as a possible limitation of this study. Disadvantages associated with case study research include the influence of the researcher (Darke et al. 1998). Bias cannot be totally eliminated but should be recognised, and its implications acknowledged and accepted (Lubbe & Remenyi 1999). The researcher's background in management consulting may have had some influence on the approach adopted for data collection and analysis. At the start of each interview, the researcher's background was explained. At the time of the research, the researcher had not consulted in the field of IT or the industries studied. In addition, the process of theory building from cases has the potential to generate theory with less researcher bias than other methods by 'unfreezing' thinking (Eisenhardt 1989). Therefore, while acknowledged, the impact of researcher bias is expected to be low.

7.8 Suggested Further Research

The overall approach of this study was *theory building*. The proposed model extends on past theoretical work by adopting an integrated approach to understanding and explaining effective IT project evaluation practice. Thirty-six companies and 72 managers participated in this research. The model that emerged from the case study analysis provides the foundation for further research into effective IT project evaluation practices. No claim is made that this study has captured every aspect of this complex phenomenon. It is possible that other dimensions exist that were not conceptualised. There is a need to test, validate and refine the model in different contexts. This may provide additional insights into the dimensions of effective IT project evaluation practice, and the influence of factors such as company size and culture.

Following this research, it is suggested that researchers engage in further empirical studies of effective IT project evaluation practice. There is a need to examine effective evaluation practices and behaviours in more depth, to provide clear guidance to practitioners seeking to implement or improve IT project evaluation. New empirical studies may focus on specific evaluation practices, such as stage gates, dedicated resources, accountability and the use of results. More effort needs to be devoted to understanding these effective practices and why they work. For example, this study found that accountability for results was best achieved when there was both overall accountability for company performance targets and accountability for individual project results. This distinction would be an interesting area for further study. Further extension of these practices to other industries involving a broader range of business input may also be beneficial.

As a result of the findings emerging from this study, there is also scope for further investigation into the relationships between IT project evaluation practices, IT project evaluation outcomes and IT project success. These relationships are yet to be clearly established in the literature, and there is a lack of rigorous and relevant studies in this area. Research about the interrelationships and causality between effective practices is another topic for investigation. A further contribution of this study is the identification of a wide spectrum of success criteria and related processes used by companies in practice; this finding illustrates the need for further research to understand the typology of success-focused practices and their particular applicability to different contexts.

Another area of inquiry is the development of evaluation practices over time. This research recognises that the status of evaluation practices is dynamic; many participants described how evaluation practice had evolved and expressed a desire to introduce further improvements in the future. One case study company, when contacted six months after the initial interviews, had changed management structures and discarded many of their evaluation processes. No time-series analysis was done and it may be interesting to explore which practices remain effective and in place over time, and what sustains them. Related to this area of enquiry would be a deeper understanding of the patterns of development and maturity for IT project evaluation. Such work would provide interesting insights into the evolutionary stages of evaluation practice.

The results of this study provide a solid theoretical basis for further research focused on improving the evaluation of IT projects. It is hoped that this study stimulates further thinking and research into this important topic.

7.9 Conclusion

This study set out to identify the most effective IT project evaluation practices used by organisations in Australia, and to understand why they work. Qualitative analysis of interviews with 72 senior managers in 36 companies in three industries was used to determine effective practices. Six key dimensions of effective IT project evaluation practice were found to be related to effective IT project evaluation outcomes leading to more efficient use of resources and improved IT project success. Underlying these dimensions were 13 effective practices. When all of the effective practices were combined evaluation was *most* effective.

This research contributes to theory development by presenting a substantive theory of effective IT project evaluation grounded on rich empirical data. The theoretical model developed addresses important gaps in the literature. While these concepts may be discussed in isolation in the IT project evaluation literature, few studies present them in an integrated manner and relate them to effective IT project evaluation outcomes and IT project success.

Although further research is required to test the model, the theory developed is a distinct contribution to knowledge about IT project evaluation. The model of effective IT project evaluation developed in this thesis provides a significant step towards improved

understanding of IT project evaluation practice. The conclusions from this research provide important insights for improving IT evaluation practices, and ultimately, IT project outcomes.

References

Agarwal, R., M. Tanniru and M. Dacruz (1992). 'Knowledge-based support for combining qualitative and quantitative judgments in resource allocation decisions.' Journal of Management Information Systems **9**(1): 165–184.

Al-Yaseen, H., T. Eldabi, D. Lees and R. Paul (2006). 'Empirical post-implementation evaluation of IT investment appraisals: prior operational use and operational use.' European Journal of Operational Research **173**: 1000–1011.

Alavi, M. (1984). 'An assessment of the prototyping approach to information systems development.' Communications of the ACM **27**: 556–563.

Ali, S. and P. Green (2005). Determinants of effective information technology governance: a study of IT intensity. Proceedings of International IT Governance Conference, Auckland.

Alshawi, S., Z. Irani and L. Baldwin (2003). 'Benchmarking information technology investment and benefits extraction.' Benchmarking: An International Journal **10**(4): 414–423.

Alshawi, S., Z. Irani and A. Jassim (2000). 'Novel cluster performance matrix: a decision aid for evaluating computing hardware.' Journal of Intelligent Systems **10**(5–6): 543–560.

Alter, S. (1999). Information Systems: A Management Perspective. Reading, Addison Wesley.

Amram, M. and N. Kulatilaka (1999). Real options: managing strategic investments in a world of uncertainty. New York, Harvard Business School Press.

Anandarajan, A. and H. Wen (1999). 'Evaluation of information technology investment.' Management Decision **37**(4): 329–337.

Avison, D., C. Cuthbertson and P. Powell (1999). 'The paradox of information systems: strategic value and low status.' Journal of Strategic Information Systems **8**(4): 419–445.

Avison, D., J. Jones, P. Powell and D. Wilson (2004). 'Using and validating the strategic alignment model.' Journal of Strategic Information Systems **13**: 223–246.

Baccarini, D. (1999). 'The logical framework method for defining project success.' Project Management Journal **30**(4): 25–32.

Baccarini, D., G. Salm and P. Love (2004). 'Management of risks in information technology projects.' Industrial Management & Data Systems **104**(4): 286–295.

Bailey, J. and S. Pearson (1983). 'Development of a tool for measuring and analysing computer user satisfaction.' Management Science **29**(5): 519–529.

Bakos, Y. and M. Treacy (1986). 'Information technology and corporate strategy: a research perspective.' MIS Quarterly **June**: 107–119.

Ballantine, J., M. Bonner, M. Levy, A. Martin, I. Munro and P. Powell (1996a). 'The 3–D model of information systems success: the search for the dependent variable continues.' Information Resources Management Journal **9**(4): 5–14.

Ballantine, J., R. Galliers and S. Stray (1996b). 'Information systems/technology evaluation practices: evidence from UK organisations.' Journal of Information Technology **11**: 129–141.

Ballantine, J., M. Levy, A. Martin, I. Munro and P. Powell (2000). 'An ethical perspective on information systems evaluation.' International Journal of Agile Management Systems **2**(3): 233–241.

Ballantine, J. and S. Stray (1998). 'Financial appraisal and the IS/IT investment decision making process.' Journal of Information Technology **13**(1): 3–14.

Ballantine, J. and S. Stray (1999). 'Information systems and other capital investments: evaluation practices compared.' Logistics Information Management **12**(1/2): 78–93.

Bannister, F. (2008). Don't mention the war: managing disbenefits. Evaluating Information Systems: Public and Private Sector. Z. Irani and P. Love. Oxford, Butterworth-Heinemann**:** 99–117.

Bannister, F. and D. Remenyi (2000). 'Acts of faith: instinct, value and IT investment decisions.' Journal of Information Technology **15**: 231–241.

Bartis, E. and N. Mitev (2008). 'A multiple narrative approach to information systems failure: a successful system that failed.' European Journal of Information Systems **17**: 112–124.

Bedell, E. (1985). The Computer Solution: Strategies for Success in the Information Age. Homewood, Dow-Jones Irwin.

Benaroch, M. and R. Kauffman (1999). 'A case for using real options pricing analysis to evaluate information technology project investments.' Information Systems Research **10**(1): 70–86.

Bennington, P. and D. Baccarini (2004). 'Project benefits management in IT projects: an Australian perspective.' Project Management Journal **35**(2): 20–30.

Beynon-Davies, P., I. Owens and M. Williams (2004). 'Information systems evaluation and the information systems development process.' Enterprise Information Management **17**: 276–282.

Bowen, P., M. Cheung and F. Rohde (2007). 'Enhancing IT governance practices: a model and case study of an organization's efforts.' International Journal of Accounting Information Systems **8**(3): 191–221.

Brealey, R. and S. Myers (1988). Principles of Corporate Finance. New York, McGraw-Hill.

Chan, Y. (2002). 'Why haven't we mastered alignment? The importance of the informal organizational structure.' MIS Quarterly Executive **1**(2): 97–112.

Chan, Y. and S. Huff (1992). 'Strategy: an information systems research perspective.' Journal of Strategic Information Systems **4**(1): 191–201.

Changchit, C., K. Joshi and A. Lederer (1998). 'Process and reality in information systems benefit analysis.' Information Systems Journal **8**: 145–162.

Christenson, D. and D. Walker (2004). 'Understanding the role of "vision" in project success.' Project Management Journal **35**(3): 39–52.

Chua, W. (1986). 'Radical developments in accounting thought.' The Accounting Review **61**: 601–632.

Cooke-Davies, T. (2002). 'The "real" success factors in projects.' International Journal of Project Management **20**(3): 185–190.

Cooper, R. and E. Kleinschmidt (1993). 'Screening new products for potential winners.' Long Range Planning **26**(6): 74–81.

Counihan, A., P. Finnegan and D. Sammon (2002). 'Towards a framework for evaluating investments in data warehousing.' Information Systems Journal **12**: 321–338.

Cragg, P., M. King and H. Hussain (2002). 'IT alignment and firm performance in small manufacturing firms.' Journal of Strategic Information Systems **11**(2): 109–133.

Cronk, M. and E. Fitzgerald (1999). 'Understanding "IS business value": derivation of dimensions.' Logistics Information Management **12**(1/2): 40–49.

Dai, C. and W. Wells (2004). 'An exploration of project management office features and their relationship to project performance.' International Journal of Project Management **22**(7): 523–532.

Danks, D. (1997). 'When big means ugly.' MIS Quarterly **July**: 56–60.

Darke, P., G. Shanks and M. Broadbent (1998). 'Successfully completing case study research: combining rigour, relevance and pragmatism.' Information Systems Journal **8**: 273–289.

Davenport, T. (1992). Process Innovation: Reengineering Work Through Information Technology. Boston, Harvard Business School Press.

David, J., D. Schuff and R. St. Louis (2002). 'Managing your IT total cost of ownership.' Communications of the ACM **45**(1): 101–106.

Davis, M. (1971). 'That's interesting! Towards a Phenomenology of Sociology and a Sociology of Phenomenology.' Philosophy of the Social Sciences **1**: 309–344.

DeLone, W. and E. McLean (1992). 'Information systems success: the quest for the dependent variable.' Information Systems Research **3**(1): 60–95.

DeLone, W. and E. McLean (2003). 'The DeLone and McLean model of information systems success: a ten-year update.' Journal of Management Information Systems **19**(4): 9–30.

DeLone, W. and E. McLean (2004). 'Measuring e-commerce success: applying the DeLone and McLean information systems success model.' International Journal of Electronic Commerce **9**(1): 31–47.

Dos Santos, B. (1991). 'Justifying investments in new information technologies.' Journal of Management Information Systems **7**(4): 71–90.

Douglas, D. (2003). 'Inductive theory generation: a grounded approach to business enquiry.' Electronic Journal of Business Research Methods **2**(1): 47–54.

Dube, L. and G. Pare (2003). 'Rigor in information systems positivist case research: current practices, trends and recommendations.' MIS Quarterly **27**(4): 597–635.

Earl, M. (1978). 'Prototype systems for accounting, information and control.' Accounting, Organisations and Control **3**(2): 161–170.

Earl, M. (1993). 'Experiences in strategic information systems planning.' MIS Quarterly **17**(1): 1–24.

Eisenhardt, K. (1989). 'Building theories from case study research.' Academy of Management Review **14**(4): 532–550.

Espinosa, J., W. DeLone and G. Lee (2006). 'Global boundaries, task processes and IS project success: a field study.' Information Technology and People **19**(4): 345–370.

Farbey, B., F. Land and D. Targett (1992). 'Evaluating investments in IT.' Journal of Information Technology **7**: 109–122.

Farbey, B., F. Land and D. Targett (1993). How to Assess Your IT investment: A Study of Methods and Practice. Oxford, Butterworth-Heinemann.

Farbey, B., F. Land and D. Targett (1999a). 'Moving IS evaluation forward: learning themes and research issues.' Journal of Strategic Information Systems **8**: 189–207.

Farbey, B., F. Land and D. Targett (1999b). 'The moving staircase: problems of appraisal and evaluation in a turbulent environment.' Information Technology and People **12**(3): 238–252.

Farbey, B., D. Targett and F. Land (1994). 'Matching an IT project with an appropriate method of evaluation: a research note on evaluating IT.' Journal of Information Technology **9**(3): 239–243.

Farbey, B., D. Targett and F. Land (1995). 'Evaluating business information systems: reflections on an empirical study.' Information Systems Journal **5**: 235–252.

Fearon, C. and G. Philip (2005). 'Managing expectations and benefits: a model for electronic trading and EDI in the insurance industry.' Journal of Information Technology **20**(3): 177–186.

Fernández, W. and H. Lehmann (2005). 'Achieving rigour and relevance in information systems studies: using grounded theory to investigate organizational cases.' The Grounded Theory Review: An International Journal **5**(1): 79–107.

Fitzgerald, G. (1998). 'Evaluating information systems projects: a multidimensional approach.' Journal of Information Technology **13**: 15–27.

Flinders, D. (1992). 'In search of ethical guidance: constructing a basis for dialogue.' Qualitative Studies in Education **5**(2): 101–115.

Freeman, M. and P. Beale (1992). 'Measuring project success.' Project Management Journal **23**(1): 8–17.

Gable, G., D. Sedera and T. Chan (2008). 'Re-conceptualizing information system success: the IS-impact measurement model.' Journal of the Association for Information Systems **9**(7): 377–408.

Galliers, R. (1991). 'Strategic information systems planning: myths, reality and guidelines for successful implementation.' European Journal of Information Systems **1**(1): 55–64.

Gatian, A. (1994). 'IS user satisfaction: a valid measure of system effectiveness?' Information and Management **26**(3): 119–131.

Giaglis, G., N. Mylonopoulos and G. Doukidis (1999). 'The ISSUE methodology for quantifying benefits from information systems.' Logistics Information Management **12**(1/2): 50–62.

Glaser, B. (1978). Theoretical Sensitivity: Advances in the Methodology of Grounded Theory. California, Sociology Press.

Glaser, B. (2001). The Grounded Theory Perspective: Conceptualization Contrasted with Description. California, Sociology Press.

Glaser, B. and A. Strauss (1967). The Discovery of Grounded Theory: Strategies for Qualitative Research. New York, Aldine Publishing Company.

Goicoechea, A., D. Hansen and L. Duckstein (1982). Multiobjective Decision Analysis with Engineering and Business Applications. New York, Wiley.

Goldsmith, N. (1991). 'Linking IT planning to business strategy.' Long Range Planning **24**(6): 67–77.

Goodhue, D. (1995). 'Understanding user evaluations of information systems.' Management Science **41**(12): 1827–1844.

Grasenick, K. and J. Low (2004). 'Shaken, not stirred: defining and connecting indicators for the measurement and valuation of intangibles.' Journal of Intellectual Capital **5**(2): 268–281.

Gregor, S. (2006). 'The nature of theory in information systems.' MIS Quarterly **30**(3): 611–642.

Gregor, S., M. Martin, W. Fernández, S. Stern and M. Vitale (2006). 'The transformational dimension in the realization of business value from information technology.' Journal of Strategic Information Systems **15**: 249–270.

Guba, E. and Y. Lincoln (1994). Competing paradigms in qualitative research. Handbook of Qualitative Research. N. Denzin and Y. Lincoln. California, Sage.

Gunasekaran, A., P. Love, F. Rahimi and R. Miele (2001). 'A model for investment justification in information technology projects.' International Journal of Information Management **21**: 349–364.

Gunasekaran, A., E. Ngai and R. McGaughey (2006). 'Information technology and systems justification: a review for research and applications.' European Journal of Operational Research **173**(3): 957–983.

Gunasekaran, A., E. Ngai and R. McGaughey (2008). Information technology and systems justification. Evaluating Information Systems: Public and Private Sector. Z. Irani and P. Love. Oxford, Butterworth-Heinemann**:** 1–34.

Gwillim, D., K. Dovey and B. Wieder (2005). 'The politics of post-implementation reviews.' Information Systems Journal **15**(4): 307–319.

Hardy, G. (2002). 'Make sure management and IT are on the same page: implementing an IT governance framework.' Information Systems Control **3**: 14–16.

Hartman, A. and J. Sifonis (2000). Net Ready. New York, McGraw-Hill.

Healy, M. and C. Perry (2000). 'Comprehensive criteria to judge validity and reliability of qualitative research within the realism paradigm.' Qualitative Market Research: An International Journal **3**(3): 118–126.

Hedman, J. and A. Borall (2004). 'Narratives in ERP systems evaluation.' The Journal of Enterprise Information Management **17**(4): 283–290.

Hirschheim, R. and S. Smithson (1999). Evaluation of information systems. Beyond the IT Productivity Paradox. L. Willcocks and S. Lester. West Sussex, John Wiley & Sons.

Hochstrasser, B. (1990). 'Evaluating IT investments: matching techniques to project.' Journal of Information Technology **5**(4): 215–221.

Hochstrasser, B. (1992). Justifying IT investments. Proceedings of the Advanced Information Systems Conference, London.

Hochstrasser, B. and C. Griffiths (1991a). Controlling IT Investment: Strategy and Management. London, Chapman & Hall.

Hochstrasser, B. and C. Griffiths (1991b). Controlling IT Investments: Strategy and Management. London, Chapman & Hall.

Horngren, C. and G. Sundem (1987). Introduction to Management Accounting. New York, Prentice Hall.

Housel, T. and A. Bell (2001). Measuring and Managing Knowledge. New York, McGraw-Hill.

Huang, J., E. Makoju, S. Newell and R. Galliers (2003). 'Opportunities to learn from "failure" with electronic commerce: a case study of electronic banking.' Journal of Information Technology **18**: 17–26.

Hussey, J. and R. Hussey (1997). Business Research. London, Macmillan.

Iavari, J. and I. Ervasti (1994). 'User information satisfaction: IS implementability and effectiveness.' Information and Management **27**(4): 205–220.

Irani, Z. (2002). 'Information systems evaluation: navigating through the problem domain.' Information and Management **40**: 11–24.

Irani, Z., J. Ezingear and R. Grieve (1997). 'Integrating the costs of a manufacturing IT/IS infrastructure into the investment decision-making process.' Technovation **17**(11/12): 695–706.

Irani, Z., J. Ezingear and R. Grieve (1998). 'Costing the true costs of IT investments: a focus during management decision making.' Logistics Information Management **11**(1): 38–43.

Irani, Z., A. Ghoneim and P. Love (2006). 'Evaluating cost taxonomies for information systems management.' European Journal of Operational Research **173**: 1103–1122.

Irani, Z. and P. Love (2000). 'The propagation of technology management taxonomies for evaluating investments in information systems.' Journal of Management Information Systems **17**(3): 161–177.

Irani, Z. and P. Love (2001). 'Information systems evaluation: past, present and future.' European Journal of Information Systems **10**: 183–188.

Irani, Z. and P. Love (2002). 'Developing a frame of reference for ex-ante IT/IS evaluation.' European Journal of Information Systems **11**: 74–82.

Irani, Z. and P. Love (2008). Evaluating information systems: public and private sector. Oxford, Butterworth-Heinemann.

Irani, Z., A. Sharif and P. Love (2001). 'Transforming failure into success through organizational learning: an analysis of a manufacturing information system.' European Journal of Information Systems **10**(1): 55–66.

Irani, Z., A. Sharif and P. Love (2005). 'Linking knowledge transformation to information systems evaluation.' European Journal of Information Systems **14**: 213–228.

Jarvenpaa, S. and B. Ives (1991). 'Executive involvement and participation in the management of information technology.' MIS Quarterly **15**(2): 205–227.

Jiang, K. and E. Wicks (1999). 'An integrated investment justification approach for cellular manufacturing using activity-based costing and the analytic hierarchy process.' Journal of Engineering Valuation and Cost Analysis **2**(4): 271–284.

Jones, S. and J. Hughes (2001). 'Understanding IS evaluation as a complex social process: a case study of a UK local authority.' European Journal of Information Systems **10**(4): 189–203.

Jugdev, K. and R. Muller (2005). 'A retrospective look at our evolving understanding of project success.' Project Management Journal **36**(4): 19–31.

Kahneman, D., P. Slovic and A. Tversky (1982). Judgement Under Uncertainty: Heuristics and Biases. Cambridge, Cambridge University Press.

Kakati, M. and U. Dhar (1991). 'Investment justification of flexible manufacturing systems.' Engineering Costs and Production Economics **21**(3): 30–43.

Kalakota, R. and M. Robinson (1999). E-business: roadmap for success. Massachusetts, Addison Wesley.

Kaplan, B. and D. Duchon (1988). 'Combining qualitative and quantitative methods in information systems research: a case study.' MIS Quarterly **12**(4): 571–586.

Kaplan, B. and J. Maxwell (1994). Qualitative research methods for evaluating computer information systems. Evaluating Health Care Information Systems: Methods and Applications. California, Sage Publications**:** 45–68.

Kaplan, R. and D. Norton (1992). 'The balanced scorecard: measures that drive performance.' Harvard Business Review **January/February**: 71–79.

Kaplan, R. and D. Norton (1993). 'Putting the balanced scorecard to work.' Harvard Business Review **September/October**: 136–147.

Kaplan, R. and D. Norton (2001). The Strategy Focused Organization: How Balanced Scorecard Companies Thrive in the New Business Environment. Boston, Harvard Business School Press.

Karlsen, J. (2008). 'A Q-sort study of benefits realisation in IT projects.' International Journal of Business Information Systems **3**(4): 356–373.

Keen, P. (1981). 'Value analysis: justifying decision support systems.' MIS Quarterly **5**(1): 1–15.

Keen, P. (1987). MIS research: current status, trends and needs. Information Systems Education: Recommendations and Implementation. R. Buckingham, R. Hirschheim, F. Land and C. Tully. Cambridge, Cambridge University Press**:** 1–13.

Keyes-Pearce, S. (2002). Rethinking the importance of IT governance in the e-world. Proceedings of the Sixth Pacific Asia Conference on Information Systems, Tokyo.

King, J. (1983). 'Centralized versus decentralized computing: organizational considerations and management options.' Computing Surveys **15**(4): 319–349.

King, J. and E. Schrems (1978). 'Cost benefits analysis in information systems development and operations.' Computing Surveys **10**(1): 19–34.

King, M. and L. McAulay (1997). 'Information technology investment evaluation: evidence and interpretations.' Journal of Information Technology **12**: 131–143.

Klecun, E. and T. Cornford (2005). 'A critical approach to evaluation.' European Journal of Information Systems **14**: 229–243.

Kleist, V. (2003). 'An approach to evaluating e-business information systems projects.' Information Systems Frontiers **5**(3): 249–263.

Krell, K. and S. Matook (2009). 'Competitive advantage from mandatory investments: an empirical study of Australian firms.' Journal of Strategic Information Systems **18**: 31–45.

Kumar, K. (1990). 'Post implementation evaluation of computer based information systems: current practices.' Communications of the ACM **33**: 203–212.

Lee, A. (1991). 'Integrating positivist and interpretive approaches to organizational research.' Organization Science **2**: 342–365.

Lee, I. (2004). 'Evaluating business process-integrated information technology investment.' Business Process Management Journal **10**(2): 214–233.

Lefley, F. and J. Sarkis (1997). 'Short-termism and the appraisal of AMT capital projects in the US and UK.' International Journal of Production Research **35**(2): 341–368.

Li, H., P. Love and Z. Irani (2000). 'The relationship between the use of IT/IS and the productivity of consulting firms in construction.' International Journal of Construction Information Technology **8**(1): 15–27.

Lin, C. and G. Pervan (2003). 'The practice of IS/IT benefits management in large Australian organisations.' Information and Management **41**: 13–24.

Lin, C., G. Pervan and D. McDermid (2005). 'IS/IT investment evaluation and benefits realisation issues in Australia.' Journal of Research and Practice in Information Technology **37**(3): 33–49.

Lincoln, Y. and E. Guba (1985). Naturalistic Enquiry. California, Sage Publications.

Llewellyn, S. (1998). 'Narratives in accounting and management research.' Accounting, Auditing and Accountability Journal **12**(2): 220–236.

Love, P., A. Ghoneim and Z. Irani (2004). 'Information technology evaluation: classifying indirect costs using the structured case method.' The Journal of Enterprise Information Management **17**(4): 312–325.

Love, P., Z. Irani, A. Ghoneim and M. Themistocleous (2006). 'An exploratory study of indirect IT costs using the structured case method.' International Journal of Information Management **26**(2): 167–177.

Love, P., Z. Irani, C. Standing, C. Lin and J. Burn (2005). 'The enigma of evaluation: benefits, costs and risks of IT in Australian small-medium-sized enterprises.' Information and Management **42**(7): 947–964.

Lubbe, S. and D. Remenyi (1999). 'Management of information technology evaluation – the development of a managerial thesis.' Logistics Information Management **12**(1): 145–156.

Luftman, J., R. Papp and T. Brier (1999). 'Enablers and inhibitors of business-IT alignment.' Communications of AIS **1**(3): 1–33.

Markus, M. and D. Robey (1988). 'Information technology and organizational change: causal structure in theory and research.' Management Science **34**(5): 583–598.

Martinsons, M., R. Davison and D. Tse (1999). 'The balanced scorecard: a foundation for the strategic management of information systems.' Decision Support Systems **25**(1): 71–88.

McAulay, L., N. Doherty and N. Keval (2002). 'The stakeholder dimension in information systems.' Journal of Information Technology **17**: 241–255.

McKay, J. and P. Marshall (2004). Strategic Management of E-business. Australia, Wiley.

Meador, C., M. Guyote and P. Keen (1984). 'Setting priorities for DSS development.' MIS Quarterly **8**(2): 117–129.

Melville, N., K. Kraemer and V. Gurbaxani (2004). 'Information technology and organisational performance: an integrative model of business value.' MIS Quarterly **28**(2): 283–322.

Merton, R. (1948). 'The self-fulfilling prophecy.' The Antioch Review **8**: 193–210.

Miles, M. and A. Huberman (1994). Qualitative Data Analysis: An Expanded Sourcebook. California, Sage Publications.

Milis, K. and R. Mercken (2004). 'The use of the balanced scorecard for the evaluation of information and communication technology projects.' International Journal of Project Management **22**: 87–97.

Money, A., D. Tromp and T. Wegner (1988). 'The quantification of decision support benefits within the context of value analysis.' MIS Quarterly **12**(2): 223–236.

Murphy, K. and S. Simon (2002). 'Intangible benefits valuation in ERP projects.' Information Systems Journal **12**: 301–320.

Myers, M. (1994). 'Dialectic hermeneutics: a theoretical framework for the implementation of information systems.' Information Systems Journal **5**(1): 51–70.

Myers, M. (1997). 'Qualitative research in information systems.' MIS Quarterly **21**(2).

Neely, A., B. Marr, C. Adams and N. Kapashi (2002). Measuring e-business performance. Business Performance Measurement: Theory and Practice. A. Neely. Cambridge, Cambridge University Press**:** 342–360.

Newman, M. and R. Sabherwal (1996). 'Determinants of commitment to information systems development: a longitudinal investigation.' MIS Quarterly **20**(1): 23–54.

Nijland, M. and L. Willcocks (2008). How IT evaluation methods are used: Examining case research from an ANT perspective. Evaluating Information Systems: Public and Private Sector. Z. Irani and P. Love. Oxford, Butterworth-Heinemann**:** 49–77.

NOIE (2003). Productivity and Organisational Transformation: Optimising Investment in ICT. Consultancy Study NCON/02/38, National Office for the Information Economy.

Norris, G. (1996). Post-investment appraisal. Investing in Information Systems: Evaluation and Management. L. Willcocks. London, Chapman & Hall**:** 193–223.

Orlikowski, W. and J. Baroudi (1991). 'Studying information technology in organizations: research approaches and assumptions.' Information Systems Research **2**(1): 1–28.

Orlikowski, W. J. (1993). 'CASE tools are organizational change: investigating incremental and radical changes in systems development.' MIS Quarterly **17**(3): 309–340.

Owen, J. (1993). Program Evaluation: Forms and Approaches. Australia, Allen & Unwin.

Parker, M. and R. Benson (1989). 'Enterprise-wide information economics: latest concepts.' Journal of Information Systems Management **6**(4): 7–13.

Parker, M., R. Benson and H. Trainor (1988). Information Economics: Linking Business Performance to Information Technology. New Jersey, Prentice Hall.

Patel, N. and Z. Irani (1999). 'Evaluating information technology in dynamic environments: a focus on tailorable information systems.' Logistics Information Management **12**(1): 32–62.

Patton, M. (1990). Qualitative Evaluation and Research Methods. California, Sage Publications.

Patton, M. (2002). Qualitative Research and Evaluation Methods. California, Sage Publications.

Peppard, J. and J. Ward (1999). '"Mind the gap": diagnosing the relationship between the IT organisation and the rest of the business.' Journal of Strategic Information Systems **8**(1): 29–60.

Peters, G. (1994). Evaluating your computer investment strategy. Information Management: The Evaluation of Information Systems Investments. L. Willcocks. London, Chapman & Hall**:** 99–111.

Peters, G. (1996). From strategy to implementation: identifying and managing benefits of IT investments. Investing in Information Systems. L. Willcocks. London, Chapman & Hall**:** 226–240.

Petter, S., W. DeLone and E. McLean (2008). 'Measuring information systems success: models, dimensions, measures and interrelationships.' European Journal of Information Systems **17**: 236–263.

Pettigrew, A. (1990). 'Longitudinal field research on change: theory and practice.' Organization Science **1**(3): 267–292.

Piccoli, G. and B. Ives (2005). 'IT-dependent strategic initiatives and sustained competitive advantage: a review and synthesis of the literature.' MIS Quarterly **29**(4): 747–776.

Plant, R., L. Willcocks and N. Olson (2003). 'Measuring E-business performance: towards a revised balanced scorecard approach.' Information Systems and E-business Management **1**(3): 265–281.

Porter, M. (1985). 'Technology and competitive advantage.' Journal of Business Strategy **5**(3): 60–78.

Powell, P. (1992). Information technology and business strategy: a synthesis of the case for reverse causality. Proceedings of the Thirteenth International Conference on Information Systems, Dallas.

Powell, T. and A. Dent-Micallef (1997). 'Information technology as competitive advantage: the role of human, business and technology resources.' Strategic Management Journal **18**(5): 375–405.

Rai, A., S. Lang and R. Welker (2002). 'Assessing the validity of IS success models: an empirical test and theoretical analysis.' Information Systems Research **13**(1): 50–69.

Reich, B. and I. Benbasat (1996). 'Measuring the linkage between business and information technology objectives.' MIS Quarterly **20**(1): 55–81.

Reich, B. and I. Benbasat (2000). 'Factors that influence the social dimension of alignment between business and information technology objectives.' MIS Quarterly **24**(1): 81–113.

Remenyi, D., A. Money and M. Sherwood-Smith (2000). The Effective Measurement and Management of IT Costs and Benefits. Oxford, Butterworth-Heinmann.

Remenyi, D., A. Money and A. Twite (1995). The Effective Measurement and Management of IT Costs and Benefits. Boston, Butterworth-Heinemann.

Remenyi, D. and M. Sherwood-Smith (1999). 'Maximize information systems value by continuous participative evaluation.' Logistics Information Management **12**(1): 14–31.

Remenyi, D. and M. Sherwood-Smith (2001). 'Outcomes and benefit modelling for information systems investment.' International Journal of Flexible Manufacturing Systems **13**(2): 105–129.

Remenyi, D., M. Sherwood-Smith and T. White (1997). Achieving Maximum Benefits From Your Information Systems. Chichester, Wiley & Sons.

Remenyi, D. and B. Williams (1996). 'The nature of research: qualitative or quantitative, narrative or paradigmatic?' Information Systems Journal **6**(2): 131–146.

Renkema, T. (1998). 'The four P's revisited: business value assessment of the infrastructure impact of IT investment.' Journal of Information Technology **13**: 181–190.

Renkema, T. and E. Berghout (1997). 'Methodologies for information systems investment evaluation at the proposal stage: a comparative review.' Information and Software Technology **39**: 1–13.

Reyck, B., Y. Grushka-Cockayne, M. Lockett, S. Calderini, M. Moura and A. Sloper (2005). 'The impact of project portfolio management on information technology projects.' International Journal of Project Management **23**(7): 524–537.

Robey, D. and M. Markus (1998). 'Beyond rigor and relevance: producing consumable research about information systems.' Information Resources Management Journal **11**(1): 7–15.

Ross, J. and M. Vitale (2000). 'The ERP revolution: surviving versus thriving.' Information Systems Frontiers **2**: 233–241.

Rubin, H. and I. Rubin (2005). Qualitative Interviewing: The Art of Hearing Data. California, Sage Publications.

Ryan, S. and D. Harrison (2000). 'Considering social subsystem costs and benefits in information technology investment decisions: a view from the field on anticipated payoffs.' Journal of Management Information Systems **16**(4): 11–40.

Saarinen, T. (1996). 'An expanded instrument for evaluating information systems success.' Information and Management **31**(2): 103–118.

Saaty, T. (1990). 'How to make a decision: the analytical hierarchy process.' European Journal of Operational Research **48**: 9–26.

Sarantakos, S. (1998). Social Research. Australia, MacMillan Education.

Scheepers, R. and H. Scheepers (2003). Contexts of relevance in exploratory case studies in information systems: ubiquitous information technology implementation in organisations. Proceedings of the Twenty-Fourth International Conference on Information Systems, Seattle.

Schwalbe, K. (2004). Information Technology Project Management. Boston, Thomson Publishing.

Seddon, P., V. Graeser and L. Willcocks (2002). 'Measuring organisational IS effectiveness: an overview and update of senior management perspectives.' Database for Advances in Information Systems **33**(2): 11–28.

Seddon, P. and R. Scheepers (2006). Other-settings generalization in IS research. Proceedings of the Twenty-Seventh International Conference on Information Systems, Milwaukee.

Seddon, P., S. Staples, R. Patnayakuni and M. Bowtell (1999). 'Dimensions of information systems success.' Communications of the Association for Information Systems **2**: 2–39.

Segars, A. and V. Grover (1998). 'Strategic information systems planning success: an investigation of the construct and its measurement.' MIS Quarterly **22**(2): 139–163.

Serafeimidis, V. and S. Smithson (1999). 'Rethinking the approaches to information systems investment evaluation.' Logistics Information Management **12**(1/2): 94–107.

Serafeimidis, V. and S. Smithson (2000). 'Information systems evaluation in practice: a case study of organizational change.' Journal of Information Technology **15**: 93–105.

Serafeimidis, V. and S. Smithson (2003). 'Information systems evaluation as an organisational institution: experience from a case study.' Information Systems Journal **13**(2): 251–274.

Sethi, V. and W. King (1994). 'Development of measures to assess the extent to which an information technology application provides competitive advantage.' Management Science **40**(12): 1601–1627.

Shang, S. and P. Seddon (2002). 'Assessing and managing the benefits of enterprise systems: the business manager's perspective.' Information Systems Journal **12**: 271–299.

Sharif, A. and Z. Irani (1999). 'Theoretical optimisation of IT/IS investments: A research note.' Journal of Logistics Information Management **12**(12): 189–196.

Sharif, A., Z. Irani and P. Love (2005). 'Integrating ERP using EAI: a model for *post hoc* evaluation.' European Journal of Information Systems **14**: 162–174.

Sieber, J. (1992). Planning Ethically Responsible Research: A Guide for Students and Internal Review Boards. London, Sage.

Silverman, D. (2001). Interpreting Qualitative Data: Methods for Analysing Talk, Text and Interaction. London, Sage Publications.

Slevin, D., P. Stieman and M. Boone (1991). 'Critical success factor analysis for systems performance, measurement and enhancement.' Information and Management **21**: 1161–1182.

Smaczny, T. (2001). 'Is an alignment between business and information technology the appropriate paradigm to manage IT in today's organisations?' Management Decision **39**(10): 797–802.

Smith, H. and J. McKeen (2003). 'Developments in practice VII: developing and delivering the IT value proposition.' Communications of the AIS **11**: 438–450.

Smithson, S. and R. Hirschheim (1998). 'Analysing information systems evaluation: another look at an old problem.' European Journal of Information Systems **7**: 158–174.

Sohal, A. and L. Ng (1998). 'The role and impact of information technology in Australian business.' Journal of Information Technology **13**: 201–217.

Staples, S., I. Wong and P. Seddon (2002). 'Having expectations of information systems benefits that match received benefits: does it really matter?' Information and Management **40**: 115–131.

Stewart, R. and S. Mohamed (2002). 'IT/IS projects selection using multi-criteria utility theory.' Logistics Information Management **15**(4): 254–270.

Stockdale, R. and C. Standing (2006). 'An interpretive approach to evaluating information systems: a content, context, process framework.' European Journal of Operational Research **173**: 1090–1102.

Strassmann, P. (1990). Information Payoff. New York, Free Press.

Strauss, A. and J. Corbin (1990). Basics of Qualitative Research: Grounded Theory Procedures and Techniques. California, Sage Publications.

Strauss, A. and J. Corbin (1998). Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory. California, Sage Publications.

Sugumaran, V. and B. Arogyaswamy (2004). 'Measuring IT performance: "contingency" variables and value models.' Journal of Computer Information Systems **44**(2): 79–86.

Suwardy, T., J. Ratnatunga, A. Sohal and G. Speight (2003). 'IT projects: evaluation, outcomes and impediments.' Benchmarking: An International Journal **10**(4): 325–342.

Symons, V. (1991). 'A review of information systems evaluation: content, context and process.' European Journal of Information Systems **1**: 205–212.

Symons, V. (1993). 'Evaluation and the failure of control: information systems development in the processing company.' Accounting, Management and Information Technology **3**(1): 51–76.

Szajna, B. and R. Scammel (1993). 'The effect of information system user expectations on their performance and perceptions.' MIS Quarterly **17**(4): 493–516.

Tallon, P., K. Kraemer and V. Gurbaxani (2000). 'Executives' perceptions of the business value of information technology: a process orientated approach.' Journal of Management Information Systems **16**(4): 145–173.

Teo, T. and J. Ang (1999). 'Critical success factors in the alignment of IS plans with business plans.' International Journal of Information Management **19**(2): 173–185.

Teo, T. and W. King (1997). 'Integration between business planning and information systems planning: an evolutionary-contingency perspective.' Journal of Management Information Systems **14**(1): 185–214.

Teubner, R. (2007). 'Strategic information systems planning: a case study from the financial services industry.' Journal of Strategic Information Systems **16**(1): 105–125.

Tjan, A. (2001). 'Finally a way to put your internet portfolio in order.' Harvard Business Review **February**: 76–85.

Van de Ven, A. (1989). 'Nothing is quite so practical as a good theory.' Academy of Management Review **14**(4): 486–489.

Walsham, G. (1993). Interpreting Information Systems in Organizations. New York, John Wiley & Sons.

Walsham, G. (1995). 'Interpretive case studies in IS research: nature and method.' European Journal of Information Systems **4**: 74–81.

Walsham, G. (2006). 'Doing interpretive research.' European Journal of Information Systems **15**: 320–330.

Ward, J. (1990). 'A portfolio approach to evaluating information systems investments and setting priorities.' Journal of Information Technology **5**: 222–231.

Ward, J. and P. Griffiths (1996). Strategic Planning for Information Systems. New York, John Wiley & Sons.

Ward, J. and J. Peppard (1996). 'Reconciling the IT/business relationship: a troubled marriage in need of guidance.' Journal of Strategic Information Systems **5**: 37–65.

Ward, J. and J. Peppard (2002). Strategic Planning for Information Systems. Chichester, Wiley.

Ward, J., P. Taylor and P. Bond (1996). 'Evaluation and realization of IS/IT benefits: an empirical study of current practice.' European Journal of Information Systems **4**: 214–225.

Wateridge, J. (1998). 'How can IS/IT projects be measured for success?' International Journal of Project Management **16**(1): 59–63.

Weill, P. and M. Broadbent (1998). Leveraging the New Infrastructure: How Market Leaders Capitalize on Information Technology. Boston, Harvard Business School Press.

Weill, P. and M. Olsen (1989). 'Managing investment in information technology: mini case examples and implications.' MIS Quarterly **13**(1): 3–17.

Weill, P. and J. Ross (2004). IT Governance: How Top Performers Manage IT Decision Rights for Superior Results. Boston, Harvard Business School Press.

Whetten, D. (1989). 'What constitutes a theoretical contribution?' Academy of Management Review **14**(4): 490–495.

Willcocks, L. (1992). 'Evaluating information technology investments: research findings and reappraisal.' Journal of Information Systems **2**: 243–268.

Willcocks, L. (1994). Information Management. London, Chapman & Hall.

Willcocks, L. (1996a). Investing in Information Systems. London, Chapman & Hall.

Willcocks, L. (1996b). Investing in Information Systems: Evaluation and Management. London, Chapman & Hall.

Willcocks, L. and V. Graeser (2001). Delivering IT and E-Business Value. Oxford, Butterworth-Heinemann.

Willcocks, L. and C. Griffiths (1997). Management and risk in major information technology projects. Managing IT as a Strategic Resource. L. Willcocks, D. Feeny and G. Islei. Maidenhead, McGraw-Hill.

Willcocks, L. and S. Lester (1996). The evaluation and management of information systems investment: from feasibility to routine operations. Investing in Information Systems. L. Willcocks. London, Chapman & Hall**:** 15–36.

Willcocks, L. and S. Lester (1997). Assessing IT productivity: any way out of the labyrinth? Managing IT as a Strategic Resource. L. Willcocks, D. Feeney and G. Islei. Maidenhead, McGraw-Hill**:** 64–93.

Willcocks, L. and S. Lester (1999). Beyond the IT Productivity Paradox. West Sussex, John Wiley & Sons.

Willcocks, L. and H. Margetts (1994). 'Risk assessment and information systems.' European Journal of Information Systems **5**(2): 127–138.

Williams, J. and A. Ramaprasad (1996). 'A taxonomy of critical success factors.' European Journal of Information Systems **5**(4): 250–260.

Wilson, M. and D. Howcroft (2002). 'Re-conceptualizing failure: social shaping meets IS research.' European Journal of Information Systems **11**(4): 236–250.

Wilson, M. and D. Howcroft (2005). 'Power, politics and persuasion in IS evaluation: a focus on "relevant social groups".' Journal of Strategic Information Systems **14**: 17–43.

Wixom, B. and H. Watson (2001). 'An empirical investigation of the factors affecting data warehousing success.' MIS Quarterly **25**(1): 17–41.

Yin, R. (2003). Case Study Research: Design and Methods. California, Sage Publications.

Zikmund, W. (2000). Business Research Methods. Fort Worth, The Dryden Press.

Appendix 1: Interview Questions

Part 1: Demographics

Respondent Background Information

1. Name:
2. Job Title (Position):
3. Contact Phone Number:
4. E-mail Address:

Organisation Background Information

5. Organisation Name:
6. Web Address:
7. What is the primary business activity of your organisation?
8. What is the size of your organisation in terms of annual revenue ($Am)?
9. What is the size of your organisation in terms of total employees?

Part 2: IT Evaluation Practices in General (Primary Interview)

Evaluation Processes

1. Does your organisation have clearly defined procedures (e.g. written guidelines) for evaluating IT projects?
2. If all IT projects are not formally evaluated, why not?
3. Please describe the following processes in your organisation (including strengths and weaknesses):
    a. Processes for identifying IT opportunities.
    b. Processes for prioritisation and approval.
    c. Processes for acquisition (build or buy).
    d. Processes for tracking benefits/implementation.
    e. Processes for risk management.
    f. Processes for post-implementation review.
    g. Any ongoing evaluation processes.

Other Evaluation Processes

4. Are these processes the same for all IT projects, including e-business projects? If not, how and why do they differ?

5. Are these processes the same for other capital investments? If not, how and why do they differ?

6. Do you have a formal process to ensure that lessons learned from successful (or unsuccessful) implementations are transferred to future projects?

Success Criteria

7. How do you currently conclude whether or not an IT project has been successful? What would it take for a project to be defined as a failure?

8. Is there a standard set of success criteria that are measured or do these vary by project?

9. At what stage of the process are any measures of success normally defined?

10. How confident are you that IT projects are actually delivering benefits to your organisation? (High, Medium or Low). Why?

11. What types of benefits are being provided by your IT projects? Do you consider intangible benefits in your IT project appraisal process?

Opportunities for Improvement

12. What are the major challenges that your organisation faces when evaluating IT projects?

13. What is the primary focus (purpose) of evaluation in your organisation?

14. How satisfied are you with current IT evaluation processes in your organisation, with regard to:

    a. Approach: what the organisation plans to do.

    (Not at all) 1 2 3 4 5 (Very)

    b. Deployment: how well the approach is actually implemented and adopted.

    (Not at all) 1 2 3 4 5 (Very)

    c. Results: how evaluation results are monitored and used.

    (Not at all) 1 2 3 4 5 (Very)

    d. Improvement: how evaluation processes are reviewed and improved.

(Not at all) 1 2 3 4 5 (Very)

15. How could these processes be improved?

16. Please answer Yes or No to the following. Do you believe that your current processes:

    a. Identify all available benefits for a project.

    b. Identify all available costs for a project.

    c. Adequately measures the relevant benefits.

    d. Adequately measures the relevant costs.

    e. Overstate the benefits in order to get approval.

Part 3: Evaluation of a Specific IT Project (Secondary Interview)

Project Background Information

1. Briefly describe the IT project including the importance of this project to your organisation.

2. What was the approximate cost of the project ($Am)?

3. How long has your company been using the system?

4. Users of the system refer to those who actually use the system and for whom the system was intended. Please indicate who the primary users are of the system.

Strategic Context

5. How was the idea for the project generated?

6. To what extent was the idea for the project generated as part of a formal process of identifying strategic applications?

7. What was the process for gaining approval of the project once the idea was identified?

8. Why was the project introduced?

9. What were the investment objectives of the project?

Impact of the Project

10. What capability did the project enable?

11. Was the project successful?

12. How do you know if it was successful or not? Based on what criteria?

13. Please answer True, False or Unknown to the following:

    a. The project met specifications.

    b. The project was delivered on time and within budget.

    c. The project met its investment objectives.

    d. The project produced benefits for the organisation.

14. If the project produced benefits for the organisation, what were they?

15. How were these benefits measured?

16. At what stage of the project were these benefits identified?

17. At what stage of the project were these benefits measured?

Evaluation of the Project

18. Was the project formally evaluated? Why or why not?

19. If the project was formally evaluated, at what stage of the project did this evaluation occur?

    a. For each stage, what was the purpose of conducting an evaluation at that stage?

    b. For each stage, what was the method of evaluation used? Why was that method used?

    c. For each stage, how frequently did evaluation occur?

    d. For each stage, who conducted the evaluation?

    e. For each stage, who was involved in the evaluation process?

20. What criteria were considered?

21. Which of these criteria were measured? How?

Opportunities for Improvement

22. How were the results from the evaluation used?

23. As a result of any evaluation activities, were any changes made to system design or the implementation approach?

24. What were the major barriers, if any, to the success of the project?

25. What challenges did you encounter when conducting the evaluation?

26. What were the strengths and weaknesses of the evaluation process used?

27. If you were given the power to change anything about the evaluation process, what would you do differently next time?

Appendix 2: Summary of Interviews

Company	Position	Location	Format	Interview Date
F1	Chief Information Officer Head IT Architecture	Sydney, NSW	Telephone	05Oct06 20Nov06
F2	Head of IT Department IT Program Manager	Sydney, NSW	Telephone	22Nov06 11Dec06
F3	Group Executive Information Technology Feasibility, Analysis and Design Leader Manager IT Initiatives Portfolio Project Manager	Brisbane, QLD	Face-to-face	13Dec05 13Dec05 13Dec05 13Dec05
F4	Program Office Manager Project Manager	Adelaide, SA	Telephone	29Aug06 21Sep06
F5	Workstream Driver (Portfolio Manager) Project Manager	Melbourne, VIC	Face-to-face	03Aug06 03Aug06
F6	General Manager Project Delivery Executive Manager Centre of Excellence	Sydney, NSW	Face-to-face	08May06 08May06
F7	Program Office Manager Business Consulting Manager Program Manager	Sydney, NSW	Telephone Face-to-face Face-to-face	31May06 08May06 08May06
F8	Manager Project Management Senior Manager eCommerce	Perth, WA	Face-to-face	27Apr06 01Jun06
F9	Chief Information Officer General Manager Business Transformation	Adelaide, SA	Telephone	08Jun06 14Jun06
F10	Chief Information Officer Head of Projects Office	Sydney, NSW	Telephone	20Jul06 30Aug06
F11	Chief Information Officer	Adelaide, SA	Telephone	22Aug06 03Oct06
F12	Team Leader IT Project Management Project Manager	Melbourne, VIC	Telephone	30Aug06 21Sep06
F13	Associate Director IT Development Project Manager	Perth, WA	Face-to-face	01May06 17May06
F14	Manager Program Management Office Business Solutions Delivery Manager	Perth, WA	Face-to-face	11Jul06 21Jul06
F15	Senior Manager Information Technology Business Analyst Manager Application Systems	Perth, WA	Face-to-face	11Apr06 11Apr06 11Apr06
F16	Chief Information Officer	Perth, WA	Face-to-face	31Mar06 12Apr06
F17	Chief Information Officer	Perth, WA	Face-to-face	01Aug06 12Sep06
F18	Chief Information Officer	Perth, WA	Face-to-face	26Jun06 29Aug06

Company	Position	Location	Format	Interview Date
F19	IT Manager Manager Platform Development	Perth, WA	Face-to-face	22Sep06 25Aug06
F20	General Manager Administration & Technology Coordinator Project Central Project Manager	Perth, WA	Face-to-face	17Feb06 17Feb06 17Feb06
M1	Team Leader IT Projects Project Manager	Adelaide, SA	Telephone	16Oct06 20Oct06
M2	IT Systems Administrator	Perth, WA	Face-to-face	09Nov06
M3	MIS Service Delivery Manager Manager Accounting	Perth, WA	Face-to-face	16Oct06 12Jan07
M4	IT Superintendent Project Manager	Perth, WA Melbourne, VIC	Face-to-face Telephone	22Sep06 11Oct06
M5	Global Manager IT Services Project Manager	Perth, WA	Face-to-face	20Oct06 22Sep06
M6	IS Program Office Manager Program Manager	Perth, WA	Face-to-face	28Jul06 28Jul06
M7	IT Project Director IT Project Director Technical Systems Manager	Perth, WA	Face-to-face	28Jul06 20Oct06 09Nov06
M8	Chief Information Officer Project Manager	Perth, WA	Face-to-face	27Jun06 28Aug06
M9	Project Management Office Manager Assurance Manager	Perth, WA	Face-to-face	09Jun06 22Jun06
M10	Director IT Manager Commercial Systems	Adelaide, SA	Telephone	24May06 24May06
M11	Manager Information Services, Applications and Infrastructure	Perth, WA	Face-to-face	31Mar06 31 Mar06
U1	Manager Program Management Project Manager Strategic IT&T	Perth, WA	Face-to-face	23Oct06 09Nov06
U2	Manager Corporate Strategy Development ICT Program Office Manager	Sydney, NSW	Telephone	30May06 08Jun06
U3	IT Program Manager IT Project Manager	Perth, WA	Face-to-face	24May06 17May06
U4	Manager Business Improvement	Sydney, NSW	Telephone	28Apr06 26May06
U5	Manager Project Office, IS Branch IT Program Manager Project Manager	Perth, WA	Face-to-face	12Apr06 03May06 30May06
Total: 36	Total: 72			Total: 78

Appendix 3: Summary of Evaluation Practices for Finance and Insurance Sector

Profile	**Company**	F1	F2	F3	F4
	Size (Annual Revenue)	>$A2b	>$A2b	≥ $A0.5≤ $A2b	≥ $A0.5≤ $A2b
	Focus of Operations	International	International	AU National	AU National
	Primary Ownership	AU Public	International	AU Public	AU Private
Ratings	**Satisfaction (Approach)**	4	4	4	4
	Satisfaction (Deployment)	5	5	2	4
	Satisfaction (Results)	4	4	3	4
	Satisfaction (Improvement)	3	3	3	4
	Confidence	Medium	High	High	High
Practices	**Identification/Selection**	Rigorous planning process; 3-year horizon; Long (bureaucratic) process; Flexible budget provisions for projects/pilots of short duration and <$A250k	Strong alignment to strategy; Driven from the business; IT customer relationship managers; Flexibility; Frequent use of pilots	80% of projects derived from strategy; Projects aligned to business line strategies rather than an overall group strategy	Annual strategic review; 3-year horizon; Strong alignment to strategy; Alignment to budget; Flexible provisions for out-of-cycle projects; Insufficient upfront analysis (sometimes)
	Priority Setting	Corporate priority setting based on opportunities for growth; Program of Work managed at portfolio and business unit level; Flexibility; Difficulty finding the right balance of projects; Political influence	Priority setting within each line of business; No formal criteria or weightings; Strong business engagement; Single executive appointed to 'arbitrate'; Whole of portfolio view	Priority setting using formal criteria (strategic fit, benefits and risk); Inconsistent application across the group; Focus on short-term returns	Priority setting using formal criteria balanced with management judgement; Focus on value and risk; Facilitated by PMO; High willingness to stop and re-prioritise projects
	Project Approval	Governance scaled to project value (two tiers); Rigorous; Consistent; Comprehensive cost and benefit estimates (over five years); Strong business engagement; Stage gates; Progressive refinement of estimates	Governance scaled to project value (three tiers); Stage gates; Independent verification of estimates; Accurate and robust; Single point of control through Program Promise; Top-leadership commitment; Quick and simple; Flexible	Governance scaled to multiple criteria; Rigorous approval process; Accurate estimation; Progressive refinement of estimates; Independent verification of estimates; Some process avoidance	Governance scaled to project value (two tiers); Flexibility; Control of projects via stage gate process (for major projects); Independent verification of estimates
	PIR/Closure	A PIR is conducted at closure by the Enterprise Program Office (for projects >$A250k); Lacks formality and rigour; Results not used consistently; Reluctance to stop projects	PIR and closure combined; Lessons learned used; Pragmatic approach to stopping projects; Supported by PMO	Formal project closure; Independent PIR; PIR not applied consistently; Lessons learned not used	PIR applied consistently; Focus on success and lessons learned; Success is judged against seven factors base-lined at the start of the project; Lessons learned used (but process needs to become embedded)
	Benefits Realisation	Benefits realisation plan; No tracking of benefits beyond the PIR; Benefits reflected in budgets; Business managers accountable for overall results but not individual projects	Robust benefits realisation process; Strong emphasis on measurement; Independent verification of results; Benefits tracked until realised; Accountability to Program Promise	Formal benefits realisation process (for projects >$A100k); Benefits realisation plan; Baseline measurement; Use of results chains; Benefits tracked until realised; Benefits reflected in budgets; Supported by PMO; Accountability for results	Benefits delivery plan prepared at first stage gate; Benefits realisation integrated with planning and budgeting; Rigorous tracking of expense benefits; Regular measurement linked to business plans

Profile	**Company**	F5	F6	F7	F8
	Size (Annual Revenue)	≥ $A0.5≤ $A2b	>$A2b	>$A2b	≥ $A0.5≤ $A2b
	Focus of Operations	International	AU National	International	AU State
	Primary Ownership	International	AU Public	AU Public	International
Ratings	**Satisfaction (Approach)**	4	3	4	4
	Satisfaction (Deployment)	4	2	2	4
	Satisfaction (Results)	3	2	3	3
	Satisfaction (Improvement)	3	4	3	4
	Confidence	High	Medium	Medium	Medium
Practices	**Identification/Selection**	Annual strategic review; 3-year horizon; Strong alignment to strategy (six goals); Top-down; Driven from the business; Broad consultation; Rigorous; Process to manage out-of-cycle projects	Annual strategic review; 3-year horizon; Driven from the business; Broad consultation; Inconsistent selection criteria; Use of seed funding for scoping and pilot studies	Comprehensive; Strong alignment to strategy (five strategic imperatives); Lack of business ownership; IT-business relationship issues; Improving with centralisation of IT	Annual strategic review; 5-year planning horizon; Rigorous; Strong alignment to strategy; Alignment to budget; Use of pilots
	Priority Setting	Value-based approach to project prioritisation; High willingness to stop and re-prioritise projects; Focus on financial criteria	Priority setting using formal criteria; Priorities set within business units; Focus on financial criteria	No formal criteria or weightings; Political behaviour; Focus on financial criteria; Intent to formalise	Priority setting within each division (project prioritization groups); No formal criteria or weightings
	Project Approval	Governance scaled to project complexity; Flexibility; Rigorous; Single point of funding control; Stage gates; Accurate estimation; Progressive refinement of estimates (at gates); Independent verification of estimates	Five tiers of governance based on project value; Single point of funding control (IRC); Uniform process for costing (Design and Costing Team); Some manipulation of processes	Governance scaled to project value (and impact); Formal; Rigorous; Bureaucratic; Lacks flexibility; Independent verification of estimates; Wasted resources; Process avoidance/manipulation; Stage gates (for large projects)	Robust; Well defined; Accepted part of business; Bureaucratic; Some process avoidance; Independent verification of estimates
	PIR/Closure	PIR conducted as part of closure; PIR mandated for all projects (not scaled); Centrally coordinated by PMO; Focus on learning; Lessons learned feed into project improvement program; Can be rushed due to time constraints	PIR and closure combined; Scaled PIR; Independent review for large projects (>$A1m); Limited use of results; Lack of top-level support	Formal closure and PIR ('value capture review'); PIR and closure not applied regularly or consistently; Project managers defensive	PIR conducted as part of closure; Lessons learned used; Completed by project manager (not independent)
	Benefits Realisation	Benefits delivery plan prepared at third stage gate; Managed by PMO; Benefits tracked for 6–24 months; Benefits realisation integrated with planning, budgets, company KPIs and personal scorecards	Accountability for overall results; Benefits sometimes reflected in budgets; Inconsistent application of benefits measurement; No benefits tracking beyond the PIR	Not applied consistently; One-off process; No benefits tracking beyond the PIR; Company measurement systems limited; Intent to formalise benefits realisation	Inadequate (but improving); Use of benefits delivery plans; Accountability for overall results; Difficulties measuring benefits; Intent to formalise benefits realisation

Profile	**Company**	F9	F10	F11	F12
	Size (Annual Revenue)	≥ $A0.5≤ $A2b	<$A500m	<$A500m	<$A500m
	Focus of Operations	AU State	AU National	AU National	International
	Primary Ownership	AU Public	AU Private	International	AU Private
Ratings	**Satisfaction (Approach)**	4	5	3	3
	Satisfaction (Deployment)	3	5	4	2
	Satisfaction (Results)	3	4	2	1
	Satisfaction (Improvement)	2	4	5	2
	Confidence	High	High	Medium	Low
Practices	**Identification/Selection**	Three-year plans, roadmaps and architecture framework; Broad consultation; Combined IT and business perspectives; IT relationship managers; Informal links to long-term strategy	Open environment; Strong alignment to strategy (corporate priorities); Selection of the right projects; Coordinated by project review group; 12-month forward project planning (project portfolio roadmap)	Annual strategic review; 3-year horizon; Alignment to strategy (three key drivers); Transparent; Difficulty achieving the right mix of projects	Annual budget process; Driven from the IT department; Lack of business ownership; IT relationship managers; No forward planning; Not aligned to strategic plans; IT-business relationship issues
	Priority Setting	Priority setting by ITSC (projects >$A200k); *Ad hoc* application of process; No formal criteria or weightings; Intent to formalise	Priority setting at divisional then company level; No formal criteria or weightings; Tolerance for intangibles; Timely decision making; Effective resource allocation; Whole of portfolio view; Focus; High willingness to stop projects	Priority setting by executive management group (projects >$A50k); No formal criteria or weightings; Intent to setup PMO to conduct initial selection; Low willingness to stop projects and re-prioritise	Priority setting by ITSC (projects >$A50k); Supported by PMO; No formal criteria or weightings; *Ad hoc* process; Insufficient upfront analysis; Political behaviour; Difficulty finding the right balance of projects
	Project Approval	Formal project governance; Governance scaled to project value; Stage gates; Independent verification of estimates (projects >$A200k); Progressive refinement of estimates	Governance scaled to project value; Single point of funding control; Stage gates; Simple; Flexible; Progressive refinement of estimates; Independent verification of estimates; Well understood; Mature (4 years); Consistent application of processes	Governance not scaled; Simple; Flexible (optional steps); Focus on financial criteria; Benefits and costs not adequately identified; Benefits overstated; Process avoidance/manipulation; Inconsistent application of processes	Governance not scaled; Single funding approval; Process perceived by the business as bureaucratic; Process avoidance/manipulation; Inconsistent application of processes; Intent to formalise evaluation processes
	PIR/Closure	Formal closure and PIR; Independent PIR conducted three months after closure; Broad consultation; Lessons learned widely reported; Lessons used to continuously improve project management methodology; Dedicated resources	Formal project closure and PIR; PIR conducted six months after closure; Centrally coordinated by PMO; Simple; Flexible; Lack of interest in PIR; Results shared and used in continuous improvement process (but can be improved)	Formal PIR conducted as part of closure; Standardised process; PIR within three months of implementation; Completed by project manager (not independent); Some project managers lack skills to conduct PIR	Formal PIR process (using Six Thinking Hats); Informal project closure; PIR not mandated; PIR not applied consistently; Completed by project manager (with the project team); Lack of interest in PIRs; Lessons learned not used
	Benefits Realisation	Benefits delivery plan prepared at project start-up; Benefits review six months after PIR; Ongoing tracking of benefits (as required); Consistent application; Benefits reflected in budgets; Company measurement system (dashboards)	General managers accountable for overall results; Company measurement system; Baseline measurement of benefits; Some measurement of individual project benefits in the PIR	Lack of accountability; Benefits and costs not measured; Measures of success are not defined beyond quality and schedule; Intent to formalise benefits realisation	No benefits realisation process; Benefits not measured; Lack of accountability; Limited company measurement; Success is not formally defined; Intent to formalise benefits realisation

Profile	**Company**	F13	F14	F15	F16
	Size (Annual Revenue)	<$A500m	≥ $A0.5≤ $A2b	<$A500m	<$A500m
	Focus of Operations	AU National	AU State	AU State	AU State
	Primary Ownership	AU Private	AU Private	AU Private	AU Private
Ratings	**Satisfaction (Approach)**	4	3	4	3
	Satisfaction (Deployment)	3	3	5	3
	Satisfaction (Results)	2	2	3	2
	Satisfaction (Improvement)	4	2	3	2
	Confidence	Medium	High	Medium	High
Practices	**Identification/Selection**	Annual strategic review; 3-year strategic plan; Flexibility; Formal governance structures; Subjective; Reactionary; Focus on short-term; Political behaviour	Driven from the business; Unclear linkages from business planning to project identification; Risk of selecting the wrong projects	Annual strategic review; 3-year strategic plan (business and IT); Driven from the business; Flexible	Bi-annual strategic review; 5-year strategic plan; Strong IT-business relationship; Strong alignment to strategy
	Priority Setting	Priority setting by directors; No formal criteria or weightings; Whole of portfolio view; Intent to formalise	Priority setting by ITSC (projects >$A20k); No formal criteria or weightings; Whole of portfolio view; Closely controlled by managing director	Priority setting by senior executive group; Priority setting using weighted criteria; Weightings can be manipulated; Lack of visibility of all projects	Priority setting by executive; Whole of portfolio view; No formal criteria or weightings; Lacks formality; Subjective; Political influence
	Project Approval	Governance scaled to project value (two tiers); Single funding approval; Focus on financial criteria; Rigorous; Willingness to reject projects; Broad consultation; Benefits overstated; Bureaucratic	Governance not scaled (intent to scale); Funding for scoping studies; Simple; Process manipulation; No independent verification of business case; Limited analysis; Benefits not accurately identified; Acceptance of intangibles	Formal project governance; Governance not scaled; All projects follow four phases; Comprehensive business case; Simple approval process; Acceptance of intangibles (using balanced scorecard); Inconsistent application of processes	Governance not scaled; Simple approval process; Efficient; Benefits overstated; Resources allocated to governance structures; Effective governance of projects
	PIR/Closure	Formal project closure and PIR (benefits realisation); PIR conducted within 12 months after closure; Project closure is consistent and mature; Success is formally defined by a balanced scorecard for each project; Use of lessons learned (but can be improved)	Formal project closure; Closure conducted one month after implementation; Lessons learned workshop; Sponsor satisfaction review; Success is formally defined by project sliders; Limited use of results (lessons not learned)	Formal project closure and PIR (benefits realisation); PIR conducted three to six months after closure; Coordinated by Business Solutions; Results used to improve processes; Lessons learned not widely shared	PIR informal and not applied consistently; Success is formally defined by project sliders; High willingness to stop projects; No dedicated resources
	Benefits Realisation	Formal benefits realisation process (for projects >$A200k); Not applied consistently; Benefits realisation plan in business case; No benefits tracking beyond the PIR (when completed); One-off process; Lack of accountability; Limited company-level performance measures	No benefits realisation process; Benefits not measured; Lack of accountability; Limited company measurement	No benefits tracking beyond the PIR; One-off process; Conducted by project sponsor (not independent); Subjective; Benefits claimed not linked to budgets; Company measurement system (using balanced scorecard)	Benefits identified in business case; No benefits realisation process; Benefits not measured; Lack of accountability; Intent to formalise benefits realisation

	Company	F17	F18	F19	F20
Profile	Size (Annual Revenue)	<$A500m	≥ $A0.5≤ $A2b	<$A500m	<$A500m
	Focus of Operations	AU National	AU National	AU State	AU State
	Primary Ownership	AU Public	AU Private	AU Private	Government
Ratings	Satisfaction (Approach)	4	4	5	4
	Satisfaction (Deployment)	3	3	4	3
	Satisfaction (Results)	2	3	3	2
	Satisfaction (Improvement)	4	4	3	2
	Confidence	High	High	Medium	Medium
Practices	Identification/Selection	Annual strategic review; 3-year horizon; Alignment to strategy; Broad consultation; Business engagement	Annual strategic plan; Central repository of ideas; Strong alignment to strategy; Identification of opportunities lacks formality; Intent to setup PMO	Comprehensive; Strategic plan; Department business plans; Strong IT-business relationship; Business engagement; Responsive; Lots of good ideas	Comprehensive; Five-year strategic plan (three time horizons); Strong alignment to strategy; Annual review aligned to budget cycle; Lacks flexibility
	Priority Setting	Priority setting by executive; Priority setting using formal criteria (benefits and risk); No process to stop projects; Intent to setup ITSC	Priority setting by project governance board; Priority setting using weighted criteria (business value, cost and risk); Rigorous; Accurate; High willingness to stop projects	Priority setting within each business unit; No formal criteria or weightings; Limited competition for resources; Political influence	Priority setting by executive group (for major projects); Priority setting using weighted criteria (financial value, risk, strategic alignment); Rigorous
	Project Approval	Governance not scaled; Single funding approval; Funding for pilot and scoping studies; Top-leadership commitment; Simple; Accurate; Acceptance of intangibles; Intent to formalise project governance	Governance scaled to multiple criteria; Top-leadership commitment; Single point of funding control; Single funding approval; Simple (one-step); Use of pilot studies	Governance scaled to project value; Simple; Flexible; Timely decision making; Single funding approval; Stage gates; Approval of the right projects	Governance scaled to multiple criteria; Stage gates; Rigorous; Independent verification of estimates (dedicated resources); Bureaucratic; Inconsistent application of processes
	PIR/Closure	No closure or PIR process; No lessons learned process; Intent to formalise closure and PIR	Formal project closure; Completed one month after implementation; Lacks rigour; Lessons learned not used	Formal PIR (benefits realisation); PIR conducted three to six months after implementation; Lessons learned shared in IT (but not across the company)	Formal closure; Independent PIR ('end of project review'); Inconsistent application of processes; Lessons learned not used
	Benefits Realisation	No benefits realisation process; Benefits not measured; Success is not formally defined; Intent to formalise benefits realisation	No benefits tracking beyond project closure; One-off process; Baseline measurement of benefits; Inconsistent application; Intent to formalise benefits realisation; Company measurement system (using balanced scorecard)	No benefits tracking beyond the PIR; One-off process; Company measurement system; Accountability (by reputation)	Benefits delivery plan; Continuous focus on benefits; Benefits tracked until realised; Coordinated by project central; Accountability for results (via business ownership and budgets); Not applied consistently

Appendix 4: Summary of Evaluation Practices for Mining Sector

Profile	**Company**	M1	M2	M3	M4
	Size (Annual Revenue)	>$A2b	<$A500m	≥ $A0.5≤ $A2b	≥ $A0.5≤ $A2b
	Focus of Operations	International	AU State	International	AU National
	Primary Ownership	AU Public	AU Public	International	AU Public
Ratings	**Satisfaction (Approach)**	4	2	3	3
	Satisfaction (Deployment)	3	2	4	3
	Satisfaction (Results)	2	3	1	2
	Satisfaction (Improvement)	4	3	4	3
	Confidence	Medium	Low	Medium	Low
Practices	**Identification/Selection**	Alignment with IT and business strategies; Lacks rigour; Bypassing of IT; Political behaviour	Requirements driven from mining operations; Reliance on external expertise; Political behaviour; Bypassing of IT; Selection of the wrong projects	Driven from the IT group; Broad consultation; Lack of business ownership; Projects not formally linked to business plans (no documented plan)	Driven from the IT department; Lacks formality; Bypassing of IT; Inconsistent approach to business planning
	Priority Setting	No formal priority setting; Whole of portfolio view; Limited competition for funds	Priorities follow operational needs; No formal priority setting; No portfolio view	Priority setting by regional management teams; No formal criteria or weightings; Intent to establish a PMO	Priority setting by IT department; Priority setting using formal criteria; Intent to establish a PMO; Working towards greater visibility of IT portfolio
	Project Approval	Governance scaled to project value (two tiers); Justification lacks rigour; Manipulation of processes; Inconsistent application of processes; Intent to implement stage gates (for projects >$A1m)	No formal procedures; Stage gate type process; *Ad hoc*; Robust discussions; Responsive to dynamic environment; Lack of project governance	Governance scaled to project value (three tiers); Single funding approval; Funding for scoping studies (large projects); Simple; Quick; Agile; Lacks rigour; Central (global) control of IT projects	Governance not clearly scaled; Single funding approval; Lacks rigour; Lacks formality; Introducing formal evaluation procedures
	PIR/Closure	Formal project closure; Completed within two months after implementation; Consistently applied; Completed by project manager (with the project team); Success is formally defined by project sliders; Lessons learned not used	No closure or PIR process; No lessons learned process; Intent to formalise PIR process	Formal project closure and PIR; PIR not applied consistently; Lack of ownership; No formal lessons learned process (lessons shared informally)	No closure or PIR process; No lessons learned process; Intent to formalise closure and PIR process; Reluctance to stop projects
	Benefits Realisation	No benefits realisation process; Benefits not measured; Lack of accountability	No benefits realisation process; Benefits not measured; Lack of accountability	No benefits realisation process; Benefits not measured; Inadequate measurement of costs; Lack of accountability (overall and at project level); Limited company measurement; Wasted resources	No benefits realisation process; Benefits not measured; Lack of accountability

Profile	**Company**	M5	M6	M7	M8
	Size (Annual Revenue)	<$A500m	>$A2b	≥ $A0.5≤ $A2b	>$A2b
	Focus of Operations	International	International	AU National	International
	Primary Ownership	AU Private	AU Public	AU Public	AU Public
Ratings	**Satisfaction (Approach)**	3	4	3	4
	Satisfaction (Deployment)	2	4	2	3
	Satisfaction (Results)	1	3	2	2
	Satisfaction (Improvement)	1	3	3	2
	Confidence	High	High	High	Medium
Practices	**Identification/Selection**	Driven from IT department; 3-year project horizon; Annual review; Strong alignment to strategy (five key result areas)	Comprehensive; Strong alignment to strategy; Alignment with budget cycle; business solutions managers; Business engagement; Success formally defined; Some bypassing of IT	Three planning horizons; Alignment to strategy; Alignment to budget; 12-month forward project planning; Delays from budget process	IS&T strategy linked to business strategy; IS&T Demand Coordinators; Alignment to strategy; Broad consultation; Selection of the right projects; IT-business relationship issues
	Priority Setting	Priority setting using formal criteria balanced with management judgement; Whole of portfolio view; Ongoing management of project portfolio	Priority setting using weighted criteria (business value, timeframe to benefits, risks and strategic fit); Rigorous; High willingness to stop projects	Priority setting by executive management committee; Priority setting using formal criteria; Lack of visibility of all projects; Political behaviour (for out-of-cycle projects)	Priority setting within each business unit; No formal criteria or weightings; Qualitative; Process can be improved
	Project Approval	Governance not scaled; Single funding approval; Bureaucratic; Driven from IT department; Comprehensive cost estimates; Benefits overstated	Formal governance (projects>$A100k); Stage gates; Rigorous; Progressive refinement of estimates (at gates); Independent verification of estimates; Accurate estimation; Distributed funding control (moving to single point of control); Inconsistent application of processes	Governance scaled to multiple criteria (four categories); Stage gates; Rigorous; Single funding approval; Funding for scoping studies; Driven by IT department; Flexibility (but not widely understood); Some process avoidance	Governance scaled to multiple criteria (three categories); Rigorous; Use of pilot studies; Independent verification of estimates; Bureaucratic (company 'bottlenecks'); Single funding approval; Some bypassing of IT
	PIR/Closure	No closure or PIR process; No lessons learned process; Intent to formalise closure and PIR process	Independent PIR; Formal project closure following PIR; Consistently applied; Success formally measured; Lessons learned used	Formal project closure; Comprehensive; Delays in completing project closure; Informal PIR (by projects director); Use of lessons learned	Formal project closure and PIR; Simple closure process; Closure completed by project team; Independent PIR conducted three months after closure; PIR is not mandated; Limited use of results
	Benefits Realisation	No benefits realisation process; Benefits not measured; Lack of accountability	Scaled benefits realisation process; Benefits realisation plan in business case; Use of results chains; Update of benefits at project closure; Benefits tracked for 3–12 months; Independent verification of results; Inconsistent application (process recently introduced); Company measurement	No benefits realisation process; Benefits not measured; Lack of accountability; Intent to formalise benefits realisation	No benefits realisation process; Benefits not tracked; No intent to formalise benefits realisation

Profile	**Company**	M9	M10	M11	
	Size (Annual Revenue)	>$A2b	≥ $A0.5≤ $A2b	≥ $A0.5≤ $A2b	
	Focus of Operations	International	International	International	
	Primary Ownership	AU Public	International	International	
Ratings	**Satisfaction (Approach)**	3	3	4	
	Satisfaction (Deployment)	3	4	3	
	Satisfaction (Results)	2	4	2	
	Satisfaction (Improvement)	4	2	3	
	Confidence	Medium	Medium	High	
Practices	**Identification/Selection**	IT business plan; Annual planning; Selection of the wrong projects; Wasted resources; IT-business relationship issues	Ideas tested for alignment; Alignment to budget cycle; Business consultation; Process to manage out-of-cycle projects	Comprehensive ('95% captured'); Broad consultation; Alignment to global strategy; Central (global) decision making; Rigorous performance targets; Global consistency of systems; Complexity; Bureaucracy	
	Priority Setting	Priority setting by departments; Priority setting by IT department (enterprise projects); No formal criteria or weightings; Lacks formality; Political behaviour; Lack of visibility of all projects; Duplication of projects	Priority setting by IT department; Priority setting using formal criteria (value, resources, risks and time); Whole of portfolio view	Priority setting by global teams; No formal criteria or weightings; Whole of portfolio view; High willingness to stop projects	
	Project Approval	Multiple sets of procedures; Simple (one page only); Lacks formality and rigour; Inaccurate estimation; Not standardised; Benefits overstated; Distributed funding control; Manipulation of processes	Evaluation processes not scaled ('one size fits all'); Single funding approval; Stage gates; Rigorous; Bureaucratic; Benefits overstated; Political influence; Focus on financial criteria; Lack of top-leadership commitment	Governance scaled to project value (two tiers); Standard company processes; Formal; Rigorous; Single funding approval; Funding for scoping and pilot studies; Stage gates	
	PIR/Closure	Formal project closure; Closure not applied consistently; Lack of interest in closure reports; Success formally defined (in project statement); Some projects stopped (but not enough projects); Lessons learned managed by PMO; Lessons learned not used	Formal project closure; Completed by project manager (not independent); Standard success criteria; Lessons learned used (by IT department); Lack of business engagement	Formal project closure and PIR ('post-project review'); PIR conducted six months after closure; Scaled PIR (>$A100k); Success formally defined and measured; Lessons learned captured but only shared informally	
	Benefits Realisation	No benefits realisation process; Benefits not measured; Lack of accountability	No benefits realisation process; Benefits not measured; Lack of accountability	Benefits tracking for infrastructure projects; One-off process (for other IT projects); No benefits tracking beyond the PIR; Lack of accountability	

Appendix 5: Summary of Evaluation Practices for Electricity, Gas and Water Supply Sector

Profile	**Company**	U1	U2	U3	U4
	Size (Annual Revenue)	≥$A0.5≤$A2b	≥ $A0.5≤ $A2b	≥ $A0.5≤ $A2b	>$A2b
	Focus of Operations	AU State	AU State	AU State	AU National
	Primary Ownership	Government	Government	Government	Government
Ratings	**Satisfaction (Approach)**	4	3	2	3
	Satisfaction (Deployment)	3	2	3	3
	Satisfaction (Results)	2	1	2	1
	Satisfaction (Improvement)	2	1	2	2
	Confidence	Medium	Medium	Medium	Medium
Practices	**Identification/Selection**	IT Strategic Plan; 5-year horizon; Annual and quarterly reviews; Aligned to budget; Opportunity identification lacks formality; Bypassing of IT; Intent to formalise IT relationship managers	Driven from business issues (middle management); Silo-based; *Ad hoc*; Lacks formality; Projects not always linked to business plans	Comprehensive; IT business plan; 3-year horizon; Annual review; Lack of business buy-in; Alignment to strategy; Lacks flexibility; Delays to projects out of budget cycle	5-year strategy; Annual plan; Alignment to strategy; Silo-based; Political behaviour; Budget cycle distortions; Manipulation of processes
	Priority Setting	Priority setting by executive (projects >$A100k); No formal criteria or weightings; Lacks rigour; Political behaviour; Projects not stopped	Priority setting by ICT council; No formal criteria or weightings; Subjective; Intent to formalise	Priority setting by IT council (projects >$A1m); Priority setting using formal criteria and management judgement; Short-term focus; Strategic IT projects delayed; Imbalance in project portfolio	Priority setting by IT committee; No formal criteria or weightings; Subjective; Informed decision making
	Project Approval	Governance scaled to project value (two tiers); Not standardised; Inaccurate estimation; No independent verification of business case; Intent to formalise evaluation processes (stage gates with progressive refinement of estimates)	Governance not scaled; Not standardised; No independent verification of business case; Inconsistent application of processes; Benefits not accurately identified; Focus on financial criteria	Governance scaled to project value (three tiers); Formal; Comprehensive procedures and templates; Stage gates (four stages with decision points); Benefits overstated	Governance scaled to project value (two tiers); Independent verification of estimates; Consistent application of processes; Identify sufficient benefits; Rigorous; Bureaucratic; Political influence
	PIR/Closure	Formal project closure and PIR; Not standardised; Project closure and PIR not applied consistently; No lessons learned process; Intent to formalise project closure and PIR	Formal project closure; Completed by project manager (not independent); No formal lessons learned process; Intent to formalise PIR	Formal project closure and PIR; PIR conducted six months after closure (for major projects); Centrally coordinated by PMO; Consistently applied; Lack of business interest; Lessons learned captured but not used	PIR and closure combined; PIR and closure completed by project manager (not independent); Second PIR conducted by IT PMO three months after closure; Lack of interest in second PIR (project team has 'moved on'); Lessons learned used
	Benefits Realisation	No benefits realisation process; Benefits not measured; Lack of accountability; Success is not formally defined; Intent to formalise benefits realisation (projects >$A100k)	Benefits realisation plan in business case; No benefits realisation process; Benefits not measured; Lack of accountability; Success is not formally defined; Project failures; Political influence	No benefits realisation process; Benefits not measured; Lack of accountability; Intent to formalise benefits realisation	No benefits realisation process; Benefits not measured; Lack of accountability; Company measurement system (scorecard)

Profile	**Company**	U5			
	Size (Annual Revenue)	≥ $A0.5≤ $A2b			
	Focus of Operations	AU State			
	Primary Ownership	Government			
Ratings	**Satisfaction (Approach)**	4			
	Satisfaction (Deployment)	4			
	Satisfaction (Results)	3			
	Satisfaction (Improvement)	4			
	Confidence	High			
Practices	**Identification/Selection**	5-year program of work (based on company and IT strategy); Annual update; Comprehensive; Business engagement; Strong alignment to strategy			
	Priority Setting	Priority setting using weighted criteria (corporate risk, benefits, project risk, project dependencies, strategic alignment); Whole of portfolio view; High willingness to stop projects			
	Project Approval	Governance scaled to project value; Single point of funding control; Stage gates; Rigorous; Independent verification of estimates; Accurate estimation; Progressive refinement of estimates; Success is formally defined by project sliders; Some process avoidance ('short-cuts')			
	PIR/Closure	Formal closure and PIR scaled to project value; Use of lessons learned (but can be improved); PIR conducted 6–12 months after closure; PIR not applied consistently; Coordinated by PMO; Responsibility of business manager; Lack of interest in PIRs			
	Benefits Realisation	Formal benefits realisation process (for projects >$A200k); Benefits realisation plan; One-off process; Coordinated by PMO; Benefits not always measured; Accountability for results (via benefits interview and budgets); Business managers accountable for overall results (performance agreements); Company measurement system (use of existing measures)			

Appendix 6: Meta-Matrix of Effective Practices

Group	Companies	Confidence	Satisfaction (Approach)	Satisfaction (Deployment)	Commitment		Focus		Control			Scale		Integration		Action	
					Top-Leadership Commitment	Business Engagement	Alignment to Strategy	Agreed Definition of Project Success	Portfolio Management	Stage Gates	Dedicated Resources	Standardised and Scaled Processes	Simple and Flexible Processes	Continuous Measurement	Integrated Evaluation Cycle	Accountability for Results	Use of Results
1	F2	High	High	High	**H** - Driven from the top-down by Program Promise.	**H** - Strong relationships; engagement; driven by the business.	**H** - Strong alignment to strategy; tested at Concept Stage.	**H** - Success formally defined in Terms of Reference.	**H** - Central funding control; whole of portfolio view.	**H** - Stage gates for approvals; frequent use of pilots.	**H** - PMO; relationship managers; independent review.	**H** - Scaled processes; robust; appropriate level of effort.	**H** - Quick and simple; flexible application.	**H** - Strong emphasis on measurement and benefits tracking.	**H** - Integrated *whole of lifecycle* evaluation.	**H** - Strong accountability for results to Program Promise.	**H** - Lessons learned used; high willingness to stop projects.
	F4				**H** - Decision making driven by executive leadership team.	**H** - Projects are business projects; driven by the business.	**H** - Strong alignment to strategy and planning processes.	**H** - Success formally agreed using weighted project sliders.	**H** - Central funding control; managed as a portfolio.	**H** - Stage gates to control project funding.	**H** - Facilitated by PMO; independent review.	**H** - Scaled governance; formal and standardised processes.	**H** - Simple; flexible project identification and approval.	**H** - Integrated benefits management; consistent measurement.	**H** - Integrated *whole of lifecycle* evaluation.	**H** - Strong accountability for results; budget accountability.	**H** - Focus on learning; stop projects; continuous improvement.
	F5				**H** - Top-down leadership and commitment.	**H** - Broad engagement; ownership; driven by the business.	**H** - Strong alignment to strategy; linked to company six goals.	**H** - Highly formal success construct; delivery and benefits.	**H** - Central funding control; whole of portfolio view.	**H** - Stage gates; progressive refinement of estimates.	**H** - Managed by PMO; independent review.	**H** - Scaled governance; clear roles and accountability.	**H** - Simple; flexible application of stage gate processes.	**H** - Integrated company measurement and benefits tracking.	**H** - Integrated *whole of lifecycle* evaluation.	**H** - Strong accountability for results at multiple levels.	**H** - Focus on learning; stop projects; continuous improvement.
	F10				**H** - Executive Team commitment and control.	**H** - Strong IT-business relationship based on trust.	**H** - Strong alignment to strategy; linked to corporate priorities.	**M** - Defined success criteria in project charter.	**H** - Central funding control; whole of portfolio view.	**H** - Stage gates; progressive refinement of estimates.	**H** - Project review group; PMO; independent review.	**H** - Scaled governance; standardised; clear roles; well understood.	**H** - Simple and clearly defined; flexible application.	**H** - Company measurement; continuous; success measurement.	**M** - Focus on *ex-ante* evaluation; some integration with *ex-post*.	**H** - Sponsors accountable for overall results.	**H** - Use of results; stop projects; continuous improvement.
	M6				**H** - Agreement and support for processes at the Vice-President level.	**H** - Strong business engagement; joint responsibility.	**H** - Strong alignment to strategy and planning processes.	**H** - Critical success factors and benefits defined in business case.	**M** - Moving to central funding control; managed as a portfolio.	**H** - Stage gates; progressive refinement of estimates.	**H** - PMO; solutions managers; independent review.	**M** - Scaled processes; standardised; need to clarify roles.	**M** - Rigorous processes; flexible budget provisions.	**H** - Company measurement; success and benefits measurement.	**H** - Integrated *whole of lifecycle* evaluation.	**M** - Sponsors accountable for benefits realisation.	**H** - Lessons learned used; high willingness to stop projects.
	U5				**M** - GM level support; benefits tracking needs higher profile.	**H** - Business engagement; ownership by business managers.	**H** - Strong alignment to company and IT strategy.	**H** - Success formally agreed using project sliders; benefits plan.	**H** - Central funding control; whole of portfolio view.	**H** - Stage gates; progressive refinement of estimates.	**H** - Managed by PMO; independent review.	**H** - Scaled governance; formal mandated processes.	**M** - Rigorous processes; perceived by the business as bureaucratic.	**M** - Company measurement; benefits plan; inconsistent measurement.	**H** - Integrated *whole of lifecycle* evaluation.	**H** - Strong accountability for overall results; budget accountability.	**H** - Lessons learned used; stop projects; continuous improvement.
2	F1	Medium	High	High	**H** - Top-down process from board and executive.	**H** - Projects are business projects; strong business engagement.	**H** - Strong alignment to strategy and planning processes.	**M** - Success defined by objectives and planned benefits.	**M** - Integrated Program of Work; an identified improvement.	**H** - Stage gates; progressive refinement of estimates; pilot projects.	**H** - Managed by PMO; independent health checks.	**H** - Scaled governance; formal and standardised processes.	**H** - Flexible management of priorities and budget provisions.	**M** - Company measurement; benefits plan; limited results measurement.	**M** - Limited *ex-post* evaluation; benefits review at closure is too early.	**H** - Strong accountability for overall results; budget accountability.	**L** - Results not used consistently; reluctance to stop projects.
	F8				**M** - CEO and division head involvement.	**M** - Driven and owned by the business; engagement is a challenge.	**H** - Strong alignment to strategy and planning processes.	**M** - Success generally related to cost, schedule and benefits.	**H** – Central coordination; whole of portfolio management.	**M** - Two-stage funding approval; pilot projects.	**H** - Group and division PMOs; independent review.	**M** - Clearly defined and accepted; scale an identified improvement.	**L** - Bureaucratic processes; simplification an identified improvement.	**M** - Company measurement; benefits plan; inconsistent measurement.	**H** - Integrated *whole of lifecycle* evaluation.	**M** - Managers accountable for overall results; improving accountability.	**H** - Lessons learned used; continuous improvement.

Group	Companies	Confidence	Satisfaction (Approach)	Satisfaction (Deployment)	Commitment		Focus		Control			Scale		Integration		Action	
					Top-Leadership Commitment	Business Engagement	Alignment to Strategy	Agreed Definition of Project Success	Portfolio Management	Stage Gates	Dedicated Resources	Standardised and Scaled Processes	Simple and Flexible Processes	Continuous Measurement	Integrated Evaluation Cycle	Accountability for Results	Use of Results
	F15				**M** - Senior executive group involvement.	**H** - Driven by the business; ownership by department managers.	**M** - Alignment to company and IT strategy; an identified improvement.	**H** - Success formally agreed using a project balanced scorecard.	**M** - Priority system established; lack of visibility of all projects.	**M** - Single funding approval; funding for feasibility stage.	**M** - Intent to setup PMO; independent coordination and quality checks.	**M** - Standard processes; governance not scaled.	**H** - Simple approval process; flexible application of processes.	**M** - Links to company scorecard; one-off benefits measurement.	**M** - Integrated evaluation approach; benefits review is too early.	**M** - Some accountability via reports and performance appraisals.	**M** - Results used for improvement; lessons not widely shared.
	F19				**M** - Executive involvement and commitment.	**H** - Strong IT-business relationship; business engagement.	**H** - All projects must align to a goal in the Strategic Plan.	**M** - Success defined by objectives and planned benefits.	**H** – Small number of IT projects; Executive visibility of all projects.	**H** - Formal decision points in project lifecycle for control.	**M** - Business Solutions Team; resource constraints.	**M** - Scaled governance; processes to be embedded.	**H** - Simple; flexible; responsive; avoid 'red tape'.	**M** - Company measurement; benefits plan; limited benefits measurement.	**M** - PIR process recently introduced to measure benefits and success.	**M** - Some accountability via reputation; improvement expected.	**M** - Intent to improve use of results; willing to stop projects.
3	F9	High	High	Medium	**H** - Executive and board engagement; company buy-in.	**H** - Broad engagement; combined IT and business perspectives.	**M** - Links to strategy in business case; an identified improvement.	**M** - Success is on time, on budget, met expectations and benefits.	**M** - Central management of portfolio; an identified improvement.	**H** - Stage gates for approvals; progressive refinement of estimates.	**H** - PMO; relationship managers; independent evaluations.	**H** - Scaled governance; standardised; clear roles; well understood.	**M** - Some stage gate flexibility with mandatory and optional documents.	**H** - Company measurement; benefits plan; ongoing benefits measurement.	**H** - Integrated *whole of lifecycle* evaluation.	**H** - Sponsors accountable for results; budget accountability; reporting.	**H** - Lessons learned widely reported and used; continuous improvement.
	F17				**H** - Executive level involvement and commitment.	**H** - Broad consultation; driven by the business.	**H** - Strategic review process; alignment to strategy.	**L** - No formally agreed success construct.	**H** - Small number of IT projects; portfolio can be easily managed.	**M** - Single funding approval; pilot and scoping studies.	**L** - Small IT department; intent to setup ITSC.	**L** - Lack of formal processes; intent to formalise.	**H** - Simple processes; not prescriptive; based on trust.	**L** - No measurement of success.	**L** - No *ex-post* evaluation.	**L** - No evidence of accountability for results.	**M** - No lessons learned process; actively improving processes.
	F18				**H** - Top-leadership commitment and involvement.	**H** - Business ownership of projects and evaluation.	**H** - All projects must link to Strategic Plan and strategy map.	**M** - Success is on time, on budget, met requirements and benefits.	**H** - Central funding control; whole of portfolio view.	**M** - Single funding approval; pilot studies.	**M** - Approval to setup PMO; resource commitment.	**M** - Scaled governance; processes to be embedded.	**H** - Simple processes; flexible priority setting.	**M** - Company measurement; benefits plan; limited benefits measurement.	**M** - Limited *ex-post* evaluation; benefits review at closure is too early.	**M** - Some accountability via business ownership and reporting.	**M** - Intent to improve use of results; high willingness to stop projects.
	M11				**M** - Globally driven; limited evidence of leadership commitment.	**M** - Driven by IT department; high business reliance on IT and satisfaction.	**H** - Strong alignment to global strategy.	**H** - Highly formal success construct; agreed in 'project blitz'.	**H** - Central coordination; whole of portfolio view (global manager).	**H** - Stage gates for project adjustments; pilot and scoping studies.	**M** - Global teams; IT sections in each business unit.	**H** - Scaled governance; formal and standardised processes.	**M** - Rigorous processes; some bureaucracy.	**M** - Success measurement; limited benefits measurement.	**M** - Focus on *ex-ante* evaluation; some integration with *ex-post*.	**L** - Lack of accountability; an identified improvement.	**M** - Lessons learned shared informally; high willingness to stop projects.
4	F3	High	High	Low	**H** - Driven from the top-down; culture focused on achieving benefits.	**M** - Business ownership but not full engagement.	**H** - Projects derived from strategy; linked to strategic objectives.	**H** - Formally defined by project benefits linked to scorecards.	**L** - No group-wide portfolio view; distributed funding control.	**H** - Stage gates for funding; progressive refinement of estimates.	**H** - PMO facilitates and coordinates; independent review.	**M** - Scaled governance; clear roles; standards not mandated.	**M** - Rigorous processes; some complexity.	**H** - Integrated company measurement and benefits tracking.	**H** - Integrated *whole of lifecycle* evaluation.	**H** - Sponsors accountable for results; budget accountability; reporting.	**M** - Lessons not always used; measurement used to adjust projects.

Group	Companies	Confidence	Satisfaction (Approach)	Satisfaction (Deployment)	Commitment		Focus		Control			Scale		Integration		Action	
					Top-Leadership Commitment	Business Engagement	Alignment to Strategy	Agreed Definition of Project Success	Portfolio Management	Stage Gates	Dedicated Resources	Standardised and Scaled Processes	Simple and Flexible Processes	Continuous Measurement	Integrated Evaluation Cycle	Accountability for Results	Use of Results
5	F14	High	Medium	Medium	**M** - Strong involvement from MD; accountability not driven.	**M** - Projects driven from business; IT relationship issues.	**M** - Links to strategy in funding request; an identified improvement.	**H** - Success formally agreed using three project sliders.	**H** - Central funding control; whole of portfolio view.	**M** - Single funding approval; funding gate for scoping.	**M** - PMO for strategic projects; ITSC.	**M** - Formal processes; governance not scaled (intent to scale).	**M** - Simple funding process; lack of flexibility due to 'one size fits all'.	**M** - Projects managed by project sliders; no benefits measurement.	**M** - Focus on *ex-ante* evaluation; some integration with *ex-post*.	**L** - Lack of accountability for results.	**M** - Limited use of results; some improvement; company inertia.
	F16				**M** - Executive involvement and commitment.	**M** - Strong IT-business relationship; engagement is a challenge.	**H** - Strong alignment to strategy; linked to strategic objectives.	**H** - Success formally agreed using five project sliders.	**H** - Central funding control; whole of portfolio view.	**L** - No evidence of stage gate process.	**M** - Resources allocated to governance structures; skills a challenge.	**M** - Standard processes for all projects; governance not scaled.	**H** - Simple approval process; flexible application of processes.	**M** - Projects managed by project sliders; no benefits measurement.	**L** - Focus on *ex-ante* evaluation; limited *ex-post* evaluation; not integrated.	**L** - Lack of accountability for results.	**M** - No lessons learned process; high willingness to stop projects.
6	M5	High	Medium	Low	**M** - Executive decision making; not driven by leadership.	**L** - Driven by IT department; lack of business commitment.	**H** - Strong alignment to strategy; linked to five key result areas.	**L** - No formally agreed success construct.	**H** - Whole of portfolio view; ongoing management of the portfolio.	**L** - Single funding approval; no evidence of stage gates.	**L** - Limited investment in evaluation; lack of required skills.	**M** - Formal approval; governance not scaled; roles not clear.	**L** - Bureaucratic processes.	**L** - No measurement of success.	**L** - No *ex-post* evaluation.	**L** - Lack of accountability for results.	**L** - No lessons learned process; no improvement cycle.
	M7				**M** - Executive decision making; not driven by leadership.	**L** - Driven by IT department; an identified challenge and improvement.	**M** - Alignment to business strategy; some misalignment.	**M** - Success generally related to requirements, cost and schedule.	**L** - Lack of visibility of all projects; an identified improvement.	**H** - Two-stage funding approval; checkpoints at end of each stage.	**M** - PMO recently established; lack of required skills.	**M** - Scaled governance; formal processes; not well understood.	**M** - Rigorous processes; flexibility (but not widely understood).	**L** - Informal PIR used for success measurement; no benefits measurement.	**L** - Focus on *ex-ante* evaluation; limited *ex-post* evaluation; not integrated.	**L** - Lack of accountability for results.	**M** - Lessons learned shared; some improvement action.
7	F13	Medium	High	Medium	**M** - Executive decision making; parent company relationship issues.	**H** - Broad engagement; combined IT and business perspectives.	**H** - Strong alignment to strategy; linked to three levels of objectives.	**H** - Success formally agreed using a project balanced scorecard.	**M** - Whole of portfolio view; intent to formalise.	**M** - Approval of project stages; single funding approval.	**M** - Formal governance structures; some dedicated resources.	**H** - Scaled governance; standardised processes.	**L** - Bureaucratic processes.	**M** - Success measurement; limited company measurement.	**M** - Focus on *ex-ante* evaluation; some integration with *ex-post*.	**L** - Lack of accountability for results.	**M** - Use of results can be improved; willingness to reject proposals.
	F20				**H** - Top-down leadership and commitment.	**M** - Business consultation and buy-in; an identified challenge.	**H** - Strong alignment to strategy and planning processes.	**M** - Success generally related to project delivery.	**M** - Central management of portfolio; an identified improvement.	**H** - Stage gates for project approval and resource control.	**H** – PMO coordinates; independent reviews and PIR.	**M** - Scaled governance; understanding of roles can be improved.	**L** - Lack flexibility; bureaucratic; an identified improvement.	**M** - Focus on benefits; benefits plan; inconsistent measurement.	**H** - Integrated *whole of lifecycle* evaluation.	**H** - Sponsors accountable for results; budget accountability; reporting.	**M** - Limited use of results; some improvement action.
	M1				**L** - Lack of focus on IT due to size of budget relative to business.	**M** - Business consultation but not full engagement.	**M** - Ideas tested for alignment to company and IT strategy.	**H** - Success formally defined using weighted criteria.	**M** - Central funding control; whole of portfolio view; case-by-case analysis.	**L** - Single funding approval; intent to implement stage gates.	**M** - PMO; IT governance committee; lack of scrutiny.	**M** – Scaled governance; standards not mandated; roles not clear.	**L** - Lacks formality and rigour; no evidence of simplicity or flexibility.	**M** - Success measurement at closure; no benefits measurement.	**M** - Focus on *ex-ante* evaluation; some integration with *ex-post*.	**L** - Lack of accountability for results.	**L** - No lessons learned process; unwilling to reject proposals.
	M8				**L** - Lack of focus on IT; challenge for business to see the value of IT.	**M** - Business consultation; IT-business relationship issues.	**M** - Ideas tested for alignment to company and IT strategy.	**M** - Key measures of success are defined in the business case.	**L** - No complete portfolio view; distributed funding control.	**M** - Approval of project stages; single funding approval; pilot studies.	**H** - PMO; Demand Coordinators; independent review.	**H** - Scaled governance; formal and standardised processes.	**L** - Bureaucratic processes; an identified improvement.	**M** - Success measurement at closure; no benefits measurement.	**M** - Focus on *ex-ante* evaluation; some integration with *ex-post*.	**L** - No evidence of accountability for results.	**L** - Lessons learned shared informally; limited use of results.

Group	Companies	Confidence	Satisfaction (Approach)	Satisfaction (Deployment)	Commitment		Focus		Control			Scale		Integration		Action	
					Top-Leadership Commitment	Business Engagement	Alignment to Strategy	Agreed Definition of Project Success	Portfolio Management	Stage Gates	Dedicated Resources	Standardised and Scaled Processes	Simple and Flexible Processes	Continuous Measurement	Integrated Evaluation Cycle	Accountability for Results	Use of Results
	U1				**H** - Executive approval and resources to improve evaluation.	**M** - Business ownership; an identified improvement.	**M** - Alignment to IT planning and budget processes.	**L** - No formally agreed success construct.	**M** - Case-by-case analysis; central project portfolio being implemented.	**M** - Stage gate process approved and being implemented.	**M** - PMO; intent to formalise relationship managers.	**M** - Scaled governance; standard processes being implemented.	**L** - Lacks formality and rigour; no evidence of simplicity or flexibility.	**L** - No measurement of success.	**L** - Evaluation cycle is not integrated.	**L** - Lack of accountability for results.	**L** - No lessons learned process; projects not stopped; inertia.
8	F7	Medium	High	Low	**M** - Executive decision making; an identified improvement.	**L** - Lack of business ownership; IT relationship issues.	**H** - Strong alignment to strategy; linked to company goals.	**M** - Success related to delivery, satisfaction and outcomes.	**L** - Improving with recent centralisation of IT; intent to formalise.	**H** - Two-stage funding approval; stage gates for large projects.	**H** - Coordinated by PMO; independent review.	**M** - Scaled governance; standardised processes; not well understood.	**L** - Bureaucratic processes; lack flexibility; an identified improvement.	**L** - Limited company and benefits measurement.	**M** - PIR process recently introduced to measure benefits.	**L** - Lack of accountability for results; improving.	**M** - Starting to use lessons learned; actively improving processes.
9	F11	Medium	Medium	High	**M** - Top management involvement in decision making.	**M** - Business ownership; driven by IT department.	**M** - Alignment to strategy via key drivers; an identified challenge.	**M** - Success not defined beyond quality and schedule.	**M** - Whole of portfolio view; intent to formalise.	**M** - Two-stage funding approval.	**L** - Intent to setup PMO; lack of required skills.	**M** - Standard processes; governance not scaled; not well understood.	**H** - Simple and flexible processes.	**L** - Benefits and costs not adequately identified or measured.	**L** - Evaluation cycle is not integrated.	**L** - Lack of accountability for results; an identified improvement.	**M** - Focus on continuous improvement; projects not stopped.
	M3				**L** - Lack of top-leadership commitment and focus on IT.	**L** - Lack of business ownership; driven by IT department.	**L** - Not formally linked to business plans; an identified improvement.	**L** - No formally agreed success construct.	**M** - Central control and approval; an identified challenge.	**M** - Two-stage funding approval for large projects.	**L** - Resources not available for evaluation; intent to setup PMO.	**M** - Scaled governance; standardised processes; not mandated.	**M** - Simple and agile; quick decision making but lacks rigour.	**L** - No measurement of success.	**L** - Evaluation cycle is not integrated.	**L** - Lack of accountability for project and overall results.	**L** - No lessons learned process; limited use of results; projects not stopped.
	M10				**L** - Lack of top-leadership commitment and focus on IT.	**L** - Lack of business engagement; driven by IT department.	**M** - Driven from issues and global direction; ideas tested for alignment.	**M** - Success is defined using a standard set of criteria.	**H** - Whole of portfolio view; moving to central funding control.	**H** - Single funding approval; staged change request gateways.	**L** - PMO provides guidelines only; resources a major constraint.	**M** - Standard processes; governance not scaled.	**L** - Bureaucratic processes; lack flexibility; an identified improvement.	**M** - Success measurement at closure; no benefits measurement.	**M** - Focus on *ex-ante* evaluation; some integration with *ex-post*.	**L** - Lack of accountability for results.	**M** - Lessons learned used; improvement action; projects not stopped.
10	M9	Medium	Medium	Medium	**L** - Lack of focus on IT due to size of budget relative to business.	**L** - Business engagement is a challenge; IT relationship issues.	**L** - Limited alignment to strategy.	**M** - Defined success criteria in Project statement.	**L** - No portfolio view; distributed funding control; an identified improvement.	**L** - Single funding approval; no evidence of stage gates.	**L** - PMO; no ITSCs or other structures.	**L** - Multiple procedures; not standardised, not well understood.	**M** - Simple; minimum paperwork; lacks formality and rigour.	**L** - Inadequate benefits identification; no benefits measurement.	**L** - Evaluation cycle is not integrated.	**L** - Lack of accountability for results.	**L** - Limited use of results; some projects stopped, but not enough.
	U4				**M** - Top management involvement in decision making.	**L** - Driven by IT department; an identified challenge.	**M** - Alignment to strategy; budget cycle distortions.	**M** - Success is defined by objectives and critical success factors.	**M** - Central control and approval; an identified improvement.	**L** - Single funding approval; no evidence of stage gates.	**H** - PMO; ITSC; independent review.	**M** - Scaled governance; standardised processes; not well understood.	**L** - Bureaucratic processes.	**M** - PIR used for success measurement; no benefits measurement.	**M** - Focus on *ex-ante* evaluation; some integration with *ex-post*.	**L** - Lack of accountability for results; an identified challenge.	**M** - Lessons learned used; politics drives use of results, not process.

Group	Companies	Confidence	Satisfaction (Approach)	Satisfaction (Deployment)	Commitment		Focus		Control			Scale		Integration		Action	
					Top-Leadership Commitment	Business Engagement	Alignment to Strategy	Agreed Definition of Project Success	Portfolio Management	Stage Gates	Dedicated Resources	Standardised and Scaled Processes	Simple and Flexible Processes	Continuous Measurement	Integrated Evaluation Cycle	Accountability for Results	Use of Results
11	F6	Medium	Medium	Low	**L** - Lack of top-leadership support; an identified improvement.	**M** - Business consultation and ownership; IT relationship issues.	**H** - Strong alignment to strategy; linked to three levels of objectives.	**M** - Success related to delivery, satisfaction and benefits.	**H** - Central funding control; portfolio management.	**M** – Health checks; pilot and scoping studies; 'chunking' of projects.	**M** - PMO; Centre of Excellence; resource constraints.	**M** - Scaled governance; standardised processes; roles not clear.	**L** - Bureaucratic processes.	**M** - Benefits and measures identified; one-off benefits measurement.	**M** - Focus on *ex-ante* evaluation; some integration with *ex-post*.	**M** - Executives accountable for overall results; limited budget accountability.	**L** - Limited use of results; an identified improvement.
	U2				**M** - Executive approval and resources to improve evaluation.	**L** - Lack of business engagement; driven by middle managers.	**L** - Driven from business issues; not aligned to strategic plans.	**L** - No formally agreed success construct.	**M** - Improving with recent establishment of PMO; intent to formalise.	**L** - Single funding approval; no evidence of stage gates.	**M** - Recently established PMO; ICT council.	**L** - Governance not scaled; processes not standardised.	**L** - Subjective and *ad hoc*; lacks formality and rigour.	**L** - Inadequate benefits identification; no benefits measurement.	**L** - Evaluation cycle is not integrated.	**L** - Lack of accountability for results.	**L** - No lessons learned process; limited use of results.
12	U3	Medium	Low	Medium	**L** - Lack of top-leadership support; an identified improvement.	**L** - Business sponsorship but lack of buy-in; an identified challenge.	**M** - Alignment to strategy and planning processes; short-term focus.	**M** - Defined success criteria in project plan.	**M** - Central control and approval; an identified challenge.	**H** - Stage gates for approval throughout project lifecycle.	**M** - Coordinated by PMO; internal audit; limited business resources.	**H** - Scaled governance; formal and standardised processes.	**L** - Lack of flexibility to manage out-of-cycle projects.	**M** - Success measurement at closure; no benefits measurement.	**M** - Focus on *ex-ante* evaluation; some integration with *ex-post*.	**L** - Lack of accountability for results.	**L** - Lessons learned not used; limited use of results.
13	M4	Low	Medium	Medium	**L** - Lack of focus on IT due to limited impact on operations.	**L** - Business engagement is a challenge; driven by IT department.	**L** - Planning is basic and reactionary; no formal links to strategy.	**L** - No formally agreed success construct.	**L** - No complete portfolio view; distributed funding control.	**L** - Single funding approval; no stage gates; no change process.	**L** - Resources not available for evaluation; intent to setup PMO.	**L** - Lack of formal processes; intent to formalise (underway).	**L** - Funding approval lacks flexibility; lacks formality and rigour.	**L** - No measurement of success.	**L** - No *ex-post* evaluation.	**L** - Lack of accountability for results.	**L** - Current improvements; no lessons learned; projects not stopped.
14	F12	Low	Medium	Low	**L** - Lack of leadership and commitment from the CIO.	**L** - Lack of business ownership; IT relationship issues.	**L** - Not aligned to strategic plans; no link to business objectives.	**L** - No formally agreed success construct.	**L** - No complete portfolio view; an identified improvement.	**L** - Single funding approval; no evidence of stage gates.	**M** - PMO; relationship managers; an identified improvement.	**M** - Formal processes; governance not scaled; unclear roles.	**L** - Bureaucratic processes.	**L** - No measurement of success.	**L** - Evaluation cycle is not integrated.	**L** - Lack of accountability for results.	**L** - Results not used; limited improvement action.
15	M2	Low	Low	Low	**M** - Executive decision making; lack of focus on IT.	**L** - Lack of business engagement; an identified improvement.	**L** - Driven from operational mining needs; no IT strategy.	**L** - No formally agreed success construct.	**L** - No portfolio view; distributed funding control.	**M** - Stage gate type process (not formal); budget released in stages.	**L** - Full reliance on external resources.	**L** - No formal procedures; lack of project governance; unclear roles.	**M** - Simple and flexible; focus on speed not process; lacks rigour.	**L** - No measurement of success.	**L** - No *ex-post* evaluation.	**L** - Lack of accountability for results.	**L** - No lessons learned process; limited use of results.

Key: L =Low (absence of practice); M=Medium (some evidence of practice); H=High (strong evidence of practice).