

University of Technology, Sydney

Research Thesis

Understanding Learning within Information Technology Projects: an Examination of the Australian Experience

By

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Submitted in fulfilment of requirements for the degree of
Doctor of Philosophy in Computer Science

University of Technology, Sydney

Date: 20 February 2011

CERTIFICATE OF AUTHORSHIP/ORIGINALITY

I certify that the work in this thesis has not previously been submitted for a degree nor has it been submitted as part of requirements for a degree except as fully acknowledged within the text.

I also certify that this thesis has been written by me. Any help that I have received in my research work and the preparation of the thesis itself has been acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

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ACKNOWLEDGEMENTS

The author would like to acknowledge the following people for their assistance and support during the progress of this research:

Dr Ken Dovey of UTS for his inspirational supervision, and the boundless time and encouragement he has given me throughout the course of this study;

All those who were willing to give me their valuable time and assistance by agreeing to provide information for this research study. My thanks to all these friends, colleagues and contributors - your help is greatly appreciated:

Susan Hunt	Ann-Marie Bosco
Samuel Hunt	Susan Wynn
Richard Cantlon	Alex Burger
Anitra Gollings	Frank White
Jason Yeo	Tim Boyd
Kate Carruthers	Raf Stary
Richard Stuckey	Jack Boettcher
Ian Parker	Jeff Bingham
Stuart Gilbert	Greg Loughman
Andrew Twiss	David Owen
John Watson	Chris Dimitropoulos
Pauline Jones	Geoff Burgess
Steve Jones	Brendon Paine
Campbell Scott	Matt Smith
Mark Stewart	Ante Prodan
Chris Walker	Karen Christolis
Joe Donati	John Gleeson
Damir Cuca	Greg Hodge
Martin Silk	James Dummett

DEDICATION

This thesis is dedicated to:

Alfred Ernest Mortiboys

Moseley Birmingham

1872 - 1960

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ABSTRACT

Information Technology (IT) is one of the great drivers of organizational change, and initiating projects to apply new technology and systems is the means by which such changes are implemented. Effective learning is an essential focus of the innovative and successful organization of today, and IT projects present a major opportunity to generate important new knowledge for individuals and organizations. The majority of the research and literature that is concerned with workplace learning focuses on a stable and long-term workforce. Projects, however, have a temporary existence and a transitory work team. My research is concerned with understanding the significance of learning within Australian IT projects, and discovering how new knowledge is generated and exploited for the benefit of the individuals and organizations involved. The research methodology selected was phenomenology, and a series of in-depth interviews was conducted with carefully selected participants from a wide and representative range of Australian IT projects. The epistemological assumptions that sustain this approach are that the requisite knowledge exists in tacit form in the minds of those who have experienced the phenomenon of learning in projects.

The collected data was subjected to deep hermeneutic interpretation and this enabled the development of a rich understanding of the many different facets of the project learning phenomenon. At the individual level the intensity of the learning experience was found to be influenced by the participant's existing frames of reference and the level of motivation and confidence to transform them when appropriate. Projects involving a high level of tension, with opportunities for experimentation, presented particularly powerful learning experiences. The research also highlighted evidence of absorptive capacity, where more experienced practitioners were able to learn new skills faster and with less stress than those less practiced. At the team learning level, there were some examples where teams had bonded into effective learning units, but generally power sharing was limited, and decision-making largely centralised. At the organizational level, the transfer of new project knowledge was erratic: efficient methods for receiving and making use of such knowledge were largely absent. In some instances there was evidence of organizational absorptive capacity: where projects were reprises of previous failed ventures there was sufficient retained corporate memory to ensure success at a subsequent attempt.

CHAPTER 1: THESIS INTRODUCTION

Information Technology (IT) is one of the fundamental vehicles of organizational change in the twenty first century. Successful implementation of advanced IT can greatly enhance an organization's competitiveness and responsiveness. The accepted, and arguably the only, means of delivering new technology into an organization is through the establishment of a project dedicated to the task, and there is an increasing emphasis on project-based forms of activity within organizations (Bresnen et al. 2005; Newell 2004; Norrie 2008; Scarbrough et al. 2004; Sense 2003). With increasing pressure for organizations to transform themselves, combined with continuing technological advances, we can anticipate that successful and repeated delivery of IT project outcomes will continue to be paramount.

These same authors have also recognised that there are fundamental inhibitors and obstructions to the learning processes that occur as part of the project experience, and in the absence of effective learning mechanisms there is a marked propensity for successful practices to be disregarded and mistakes to be repeated. There is evidence that projects that operate in ignorance of previously acquired knowledge and experience are at risk of becoming challenged and under-delivering on their promised outcomes, and future endeavours are significantly prejudiced by a failure to apply past lessons learned.

The importance of retentiveness and creating memory when implementing change is encapsulated in the following celebrated quotation by George Santayana (Spanish-American philosopher):

> *Progress, far from consisting in change, depends on retentiveness. When change is absolute there remains no being to improve and no direction is set for possible improvement: and when experience is not retained, as among savages, infancy is perpetual. Those who cannot remember the past are condemned to repeat it.*
>
> (Santayana 1905: 284)

Santayana's words predated the information technology industry by sixty years, and the wisdom of his words was much later echoed by Kerzner (2004: 40):

> *Continuous learning and improvement are the highest level of project management maturity. Without lessons learned, a company can quickly*

revert from maturity to immaturity in project management. Knowledge is lost and past mistakes are repeated.

In the light of the importance of IT projects to ongoing organizational success, and the recognition of the need to learn to avoid repeating previous mistakes, why does research suggest that many IT projects continue to fail on delivering their required results?

I have been engaged in the IT industry for four decades, and for the majority of that time at the project "coalface", in a technical, leadership, or advisory role. I have therefore a deep personal interest in understanding the complexities of the learning process within Australian projects: this thesis sets out to examine that phenomenon across a range of representative projects.

The IT Project Landscape

A definition of a project is "an endeavour that has definable objectives, consumes resources, and operates under time, cost, and quality constraints" (Kerzner 2004: 1). Within the IT context we find that these few simple words actually encompass an enormous diversity of activity and a vast world-wide industry. As with all projects, those concerned with IT cannot easily be characterised: there is no generic project. Projects vary enormously in size, scope and complexity (Bresnen et al. 2005). Some frequently encountered examples of IT projects include such activities as:

- Upgrading all the personal computers in an organization to the latest version of the Windows operating system
- Implementing an Enterprise Resource Planning (ERP) software package
- Designing and developing a customised system to manage Futures trading within a merchant bank
- Devising a method to move business processes to an offshore service provider

Within these few examples, which all occur within my researched domain, we can recognise that a wide variety of knowledge and skill is being deployed to achieve some very different outcomes.

There have been many surveys conducted and much literature produced (the majority non-Australian) describing the troubles that many IT projects seem to encounter. As an example, the following table provides an illustration of the comparative levels of IT project outcomes in the USA during 2006 compared with a dozen years previously:

Project outcome	1994	2006
Successful %	16	35
Challenged %	53	46
Failed %	31	19
Total	100%	100%

Figure 1.1: IT Project Outcomes 1994 and 2006

Source: The Standish Group (quoted by Rubinstein 2007)

The table indicates that the ratio of success to failure has shown marked improvement over the last 12 years. The improvement has been hard-earned over a period of time when both technology and expectations have burgeoned. However a success rating of just over one-third, against a failed and challenged rating of two-thirds is hardly grounds for complacency. Whilst observers such as Krigsman (2007) dispute some of the techniques used in assembling the data, the overall message is not in doubt: many projects do not deliver satisfactorily. It is unfortunate that no such survey is available across Australian projects, but I believe it is reasonable to assume a considerable level of correspondence.

Measuring Project Success

It is important to understand the criteria that the Standish Group, who provided the figures above, uses to classify project outcomes. The projects are assessed using the Project Management Body of Knowledge (PMBOK) triple constraint theory summarised below (Saladis and Kerzner 2009):

- Successful projects are considered to be those that are delivered on time, within budget, and with all features and functions operational that were contained within the original specification.
- Challenged projects are defined as those that are delivered and operational, but under conditions of being late, or over budget, or with reduced features and functions.
- Failed projects are those that have been cancelled and never implemented.

Obeng (1994), uniquely amongst the IT writers that I have reviewed, observes that there are important "soft" success factors, quite independent of the more quantifiable success factors, that are concerned with various social aspects of the project legacy. He believes that a project should be assessed in terms of its influence on those people working within it: the learning they have drawn from it, the relationships they have established, their personal development and future motivation. These personal success factors may have a profound effect on these individuals as they move on to their next assignment. Significantly, he also believes that a project is not complete, and should not be "signed off" nor considered successful, until the organization has been given the opportunity to learn from the project experience.

The Need to Understand Project Learning

Both "projects" and "learning" are recognised and utilised as vehicles for competitive business survival, but are all too often seen as independent responses to situational challenges (Sense and Antoni 2003). It is relatively uncommon to find them discussed together, as my literature review demonstrates. Learning is essentially a human phenomenon, and the notion of learning at the level of the project team or the organization can only be conceptualised by understanding the individual learning process. Human learning in its simplest articulation is based upon existence (being alive) and experiencing external stimuli (such as social interaction) and undergoing modified thought and behavioural patterns as a result. The personal learning process is defined more comprehensively by Jarvis (2007: xi) as follows:

> *The combination of processes whereby the whole person – body (genetic, physical and biological) and mind (knowledge, skills, attitudes, values, emotions, beliefs and senses) – experiences a social situation, the perceived content of which is then transformed cognitively, emotively or practically (or through any combination) and integrated into the person's individual biography resulting in a changed (or more experienced) person.*

This definition does not, of course, imply that all learning is beneficial to the individual. However there is wide recognition that if learning can be nurtured in the most productive way within the business context, that significant performance benefits can be realised (Easterby-Smith and Lyles 2003; Elkeles and Phillips 2007; Harrison and Leitch 2008; Raelin 2008).

Is there perhaps a paradox here? On the one hand there is a wealth of material encouraging organizations to embrace workplace learning in order to improve

performance and remain competitive. On the other, we are advised that organizations are increasingly engaged in complex project activities, but that these projects are regularly failing or delivering outcomes that are significantly below expectations. When we seek information that advises us how to *learn* to deliver IT projects more efficiently we find the domain relatively under-resourced. If we refine the search further to discover how learning takes place within Australian-based IT projects, we find an almost blank canvas. In many ways Australia is different: we are remote from most of the Western world in terms of geography and time zones, and we are a large and thinly populated country, with a reputation for self-sufficiency borne of our infamous "tyranny of distance". We also have a very ethnically diverse project workforce, and a strong dependence on a mobile cohort of contractors. I believe that our project learning experiences deserve to be thoroughly investigated. Motivated by this apparent deficiency in our understanding, my thesis sets out to examine learning experiences within a wide range of Australian information technology projects and to make detailed observations regarding the nature of the learning and how it takes place.

Structure of the Thesis

The thesis document is arranged in a series of chapters that cover each stage of my examination of learning within projects. The chapters are:

1. **Thesis Introduction**

   This chapter supplies a broad overview of the study rationale and outline of the various chapter contents;

2. **Literature Review**

   This chapter provides an investigation of literature relevant to the different aspects of project learning. It references, samples and critiques existing published material in order to improve my own understanding of the core subject whilst also identifying potential deficiencies relating to my specific area of study;

3. **The Selection of the Research Methodology**

   This chapter explains the purpose of the research and provides justification for the choice of methodology. It describes the metatheoretical assumptions that have been made about the research setting and the nature of the knowledge that is sought;

4. **Selection of Research Subjects**

   This chapter describes the selection process that was employed in obtaining suitably qualified interview subjects who were prepared to participate in the research. It also provides specifics of the wide range of roles, project types, and industry groups that are represented;

5. **Research Data Acquisition**

   This chapter describes the means by which research data was collected, and explains the process of extracting qualitative information. The information thus gathered has been subject to in-depth analysis, interpretation and classification;

6. **Understanding the Project Milieu**

   This chapter examines in depth the variable nature of each project experience. It investigates and draws meaning from the unique situation of each project in terms of background, structure and relationships. This imparts a clear insight into the complex milieu in which learning occurs;

7. **The Project Learning Phenomenon**

   This chapter examines the different aspects of the learning that occurred within the projects under research. It discusses individual attitudes, learning styles, and motivation, together with the nature of learning that took place within each project team environment, and the impact of such learning on the associated organizations;

8. **Thesis Conclusion**

   This chapter concludes the research thesis, summarises key findings and provides final points of note;

9. **Appendices**

   A series of appendices is included, in which detailed demographic information is provided on each of the 24 different projects and interview participants;

10. **References**

    A complete listing of literature referenced in this study is provided at the end.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

In order to understand the concept of learning within a project situation, it is first necessary to comprehend the nature of the learning phenomenon itself. I have identified three fundamentally different aspects of learning that can occur within and in association with projects, and there exists published literature relating to each of these three fundamental domains of interest. I have developed a ring diagram (see Figure 2.1) that illustrates my theory of concentric learning, and the learning interfaces that exist between the individual, the project and the organization: this is the directional focus for my literature review and my subsequent research.

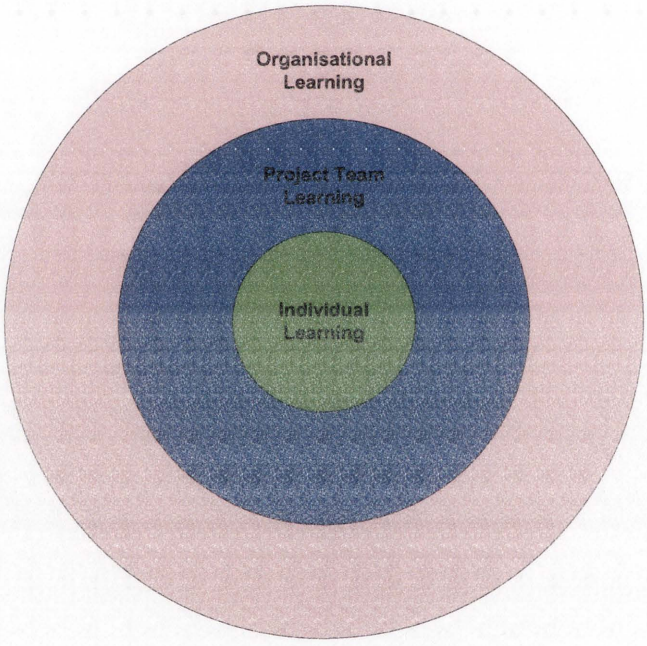


Figure 2.1: The Concentricity of Project Learning

The ring diagram is my own invention, and it was developed because of my need to understand and classify the wealth of published material about learning. Working from the centre of my diagram, there is firstly the need to consider the ways in which individuals themselves learn within the project situation. There are many factors that affect an individual's propensity to embrace (or reject) learning opportunities. Individual learning is the first stage in any process of knowledge acquisition that may subsequently be propagated to the wider project team or organizational environment. Within the first part of my review I have examined some representative literature that is

concerned with the factors that influence learning by individuals when they are engaged within a project setting.

The middle ring represents the learning that may take place within the project team itself. In this section I have reviewed some of the applicable material relating to the ways in which knowledge may be exchanged between the individual and the wider project team environment, and consequently the ways in which the group itself may learn. Project team members bring with them a variety of experience, skills, and knowledge, and the project setting is potentially a rich source of learning for all those involved.

The outer ring corresponds to the knowledge that may be propagated from individuals, or from the project team itself, into the wider organization. In order to understand how this might be achieved, I have firstly investigated the means by which organizations themselves learn. The second part of this section is concerned with investigating the means by which knowledge may be transferred from the project into the wider organization. The project operates within the boundaries of the sponsoring organization and derives its existence from there. Those businesses that frequently undertake projects would manifestly gain advantage from capturing and disseminating knowledge for the benefit of concurrent and future projects, and within the literature I intend to discover the identified processes for accomplishing this.

Finally, I have addressed some of the material relating to the history of One.Tel and the attempted creation of a learning organization within that failed company. Later in the thesis I discuss a project that was undertaken at One.Tel, and the lessons that were learned from it.

2.2 Individual Learning

There is a wealth of published material, and there have been many different theories proposed, relating to the ways in which individuals learn. In order to arrange this material into groups that are meaningful to my research and this thesis, I have classified the relevant literature into broad groups related to experiential learning, learning styles, mental models, and motivation to learn.

2.2.1 Experiential Learning

Many learning theorists have proposed that individuals learn by the process of creating knowledge through the transformation of experience (Beard and Wilson 2002; Boud et al. 1993; Kolb 1984). Experience is considered to be so fundamental that Boud et al. (1993: 8) declare that:

> *It is meaningless to talk about learning in isolation from experience. Experience cannot be bypassed; it is the central consideration of all learning.*

Beard and Wilson (2002: 17) concur that the foundation of much learning is the interaction between self and the external environment. Experience is therefore central to any consideration of learning, and learning must also be framed in the context of the subject's personal experience. However, a person's unique position in, and experience with the world will govern the nature of the learning that they derive. Two people undergoing the same experience will consequently draw different interpretations and gain different learning outcomes (Beard and Wilson 2002; Boud et al. 1993). The reflective process, whether conscious or sub-conscious, will determine whether a person derives any new or improved learning, or indeed any learning at all. Beard and Wilson (2002: 34) believe the power of personal reflection is paramount in an understanding of learning:

> *...from a practical and philosophical perspective the interaction of experience and reflection is probably the most encompassing, clarifying and relevant approach to learning...*

Our theories, which we obtain from reflection, guide us in our practice, and if we discover from practical experience that our theory is deficient, then we may modify our theory. This gives rise to the learning loop that can be expressed thus:

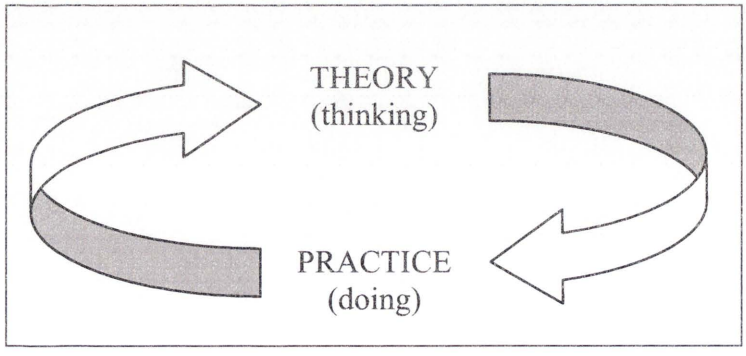


Figure 2.2: The Relationship between Theory and Practice

Kolb (1984), however, believes that the relationship between theory and practice is rather more complex, and argued that there are four stages in the transformation of learning from experience. He envisioned a learning cycle to express his theory of experiential learning (see Figure 2.3). The first stage is that of undergoing the experience or physically performing the task. The second stage is that of reflection, in which subsequent personal analysis and judgment takes place to assess the success or other outcome of the experience. This may be followed by a process of abstract conceptualisation, in which the subject determines how he/she might obtain an improved or different outcome in the same situation next time. The final stage is that of practical experimentation in which the subject actively tests his/her new theory in order to validate it in practice. This may, or may not, yield the desired outcome, but the new experience provides a further concrete base upon which to construct new knowledge. The process can therefore be conceived as a continuous loop. However, the stages of conceptualisation and experimentation are not inevitable parts of the process: there must be an element of motivation that causes the individual to undertake the completion of the learning cycle. The concept of motivation to learn is discussed later in the review.

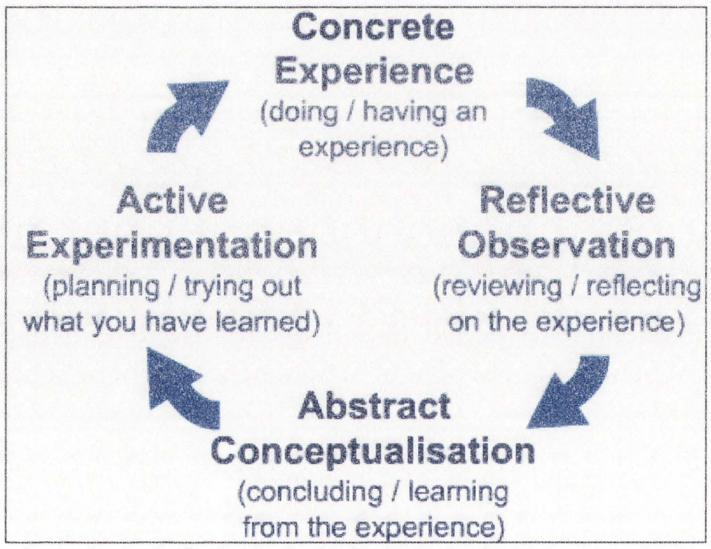


Figure 2.3: The Experiential Learning Cycle

(Based on Kolb 1984: 42)

Experiences can affect people in either a positive or negative way but the derived learning may be valuable in either case: much learning can be derived from making mistakes. Experiential learning can be painful: negative experiences can adversely

impact a person's confidence, and the challenge in the organizational context may be to recognise what has occurred and take some action (Beard and Wilson 2002).

However not all experiences generate learning: if an experience serves only to reinforce existing knowledge, or the experience does not register sufficiently strongly with the conscious mind, then the individual may not perceive a learning opportunity. In order for an experience to register on the person's personal attention scale it must generate sufficient interest within their internal value system (Rogoff 1990).

2.2.2 Learning Styles

It is important to my research to understand that individuals approach learning and assimilate knowledge in different ways. Kolb (1984) theorised that, in the course of experiencing his learning cycle, individuals tended to develop preferences and skills at different stages of the cycle. He named these learning preferences *diverging*, *assimilating*, *converging*, and *accommodating*, and positioned them within his learning cycle. When the learning styles are applied in the appropriate locations, the updated learning cycle appears as shown in Figure 2.4:

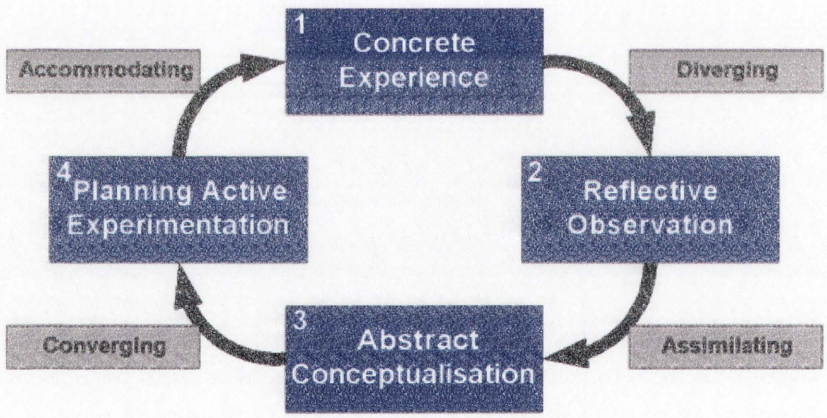


Figure 2.4: Kolb's learning cycle with learning styles

(Based on Kolb 1984: 42)

In Kolb's model, those with a *diverging* approach learn most effectively through concrete experience followed by reflective observation. These individuals are believed to be imaginative, creative, and adept at seeing things from different perspectives. *Assimilators* are those with strengths in reflective observation followed by abstract conceptualization: their capabilities lie in creating theoretical models by means of inductive reasoning. Those with a *converging* learning style are characterised by abstract conceptualisation leading to active experimentation: their proficiencies reside in

problem solving by means of deductive reasoning and practical applications of ideas. *Accommodators* are concerned with active experimentation and the creation of opportunities for concrete experience: these individuals appreciate active social engagement and first-hand involvement in activities.

The notion of individual learning styles was also recognised by Honey and Mumford (1982), who acknowledged the theory developed by Kolb in the 1970s and developed a broadly similar model, and named the styles in terms that could be more readily related to, and recognised within, the everyday workplace:

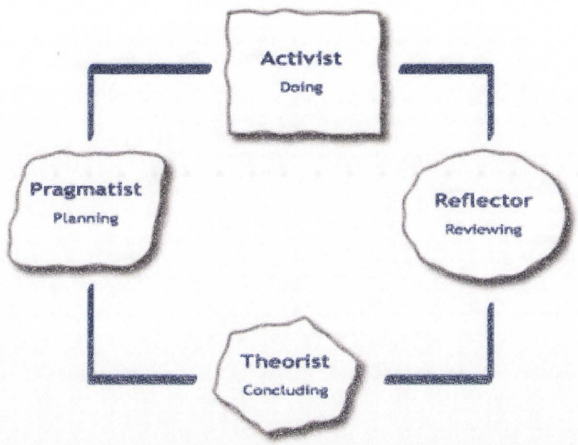


Figure 2.5: Honey and Mumford's Learning Styles

The following table summarises the relationship between Kolb's theory and the Honey and Mumford learning styles, together with the primary characteristics exhibited by the different types of learners:

Kolb's theory	Honey & Mumford Learning Style	Characteristics
Accommodating	Activist	Concerned with doing Seekers of challenges Reliant on intuition
Diverging	Reflector	Gatherers of data Analytical Imaginative
Assimilating	Theorist	Think logically Developers of ideas and theories
Converging	Pragmatist	Practical Problem solvers Decisive

Figure 2.6: Summary of Learning Styles

An alternative approach to understanding personality types, and by inference learning styles, within a project team is to employ the Myers-Briggs Type Indicator (MBTI) as defined in Myers and McCaulley (1985), which was itself derived from the early work of Carl Jung (1921) into the theory of psychological types. This analysis is more concerned with analysing personality types rather than assessing learning styles, however there are obvious similarities and correlations between these approaches. The model identifies the different ways in which individuals prefer to think and act. The psychological preferences are then sorted into four sets of opposite pairs, resulting in 16 different types. The pairs are:

extraversion (E) versus introversion (I)

sensing (S) versus intuition (N)

thinking (T) versus feeling (F)

judgment (J) versus perception (P)

Each different psychological characteristic can be assessed to derive an MBTI profile expressed as four characters such as ISTJ or ENFP and each different type will have a particular learning preference or style. According to Coffield et al. (2004) some commentators prefer to exclude the MBTI as a guide to learning style, but it is claimed that it was always the authors' intention that it should be used as an aid to learning. The most relevant aspects of MBTI to learning are considered to be the *sensing/intuition* and *thinking/feeling* characteristics. For example, within the project learning domain the psychological functions of *sensing* versus *intuition,* as the information-gathering functions, are likely to be significant. Individuals who prefer *sensing* are more likely to trust information that is in the present, such as tangible details and concrete facts, and to distrust hunches that are not supported by evidence. On the other hand, those who prefer *intuition* tend to trust information that is more abstract or theoretical, such as flashes of insight that may occur randomly within the unconscious mind. In the project context the sensing person would be more likely to create and retain knowledge from which valuable learning for the team and the organization might be derived. Sense (2007: 81) observed within a particular project how the preponderance of team members were on the intuitive side of the balance, with the result that the team was deficient at documenting facts and producing evidence to support their intuition, with potential negative implications for subsequent collective learning.

That individuals learn in different ways seems certain, and there is a host of models that attempt to analyse personal cognitive process and encapsulate learning styles. Coffield et al. (2004) critically examined 13 of the most frequently used and assessed them against a range of criteria: all were found to be deficient in some way. For the purpose of this review I have considered only three of the most frequently referenced learning style models. All three have considerable currency within industry, and (inevitably, it would appear) all have attracted considerable criticism from academics and educators.

The Kolb theory of the staged learning cycle is held by some to be flawed, and it is important to understand that individuals frequently exhibit multiple learning styles that tend to override the rather convenient categorizations (Coffield et al. 2004). Likewise the same theory is considered by Jarvis (2007) to be oversimplified. It is, however, considered by Atherton (2010) to be one of the most useful (albeit contestable) models available of the adult learning process. For the purpose of this research, I believe that it is important to understand that individuals learn in different ways and I require a suitable model that I can utilise to reflect this.

From the project perspective it would be important to understand the different learning styles of the team members. It would be valuable for the project leadership to recognise both their own preferred learning style, and that of their colleagues, with a view to optimising productivity and results. Also it would be highly likely that the most effective project team would consist of people with different approaches to learning, because of the wide range of activities that typically need to be undertaken. Therefore, I propose to utilise the Kolb/Honey & Mumford experiential learning cycle to guide my assessment of the way in which style preference influences situated personal learning.

2.2.3 The Chronology of Learning

It is also relevant to consider experiential learning in terms of its time relationship to an experience. Learning may take place concurrently with the experience, or in the light of reflection upon a past event, or as a result of anticipation of a future happening.

Concurrent learning occurs in real time, that is, one learns as the experience takes place. The subject observes a situation, or recognises feedback, and in a process of reflection-in-action immediately adjusts his/her behaviour to meet the circumstances (Schön 1983). During the course of a meeting, for example, an individual who is alert to others' body

language may consciously moderate his/her approach to avoid confrontation or maximise positive rapport.

Retrospective learning is that derived after an experience has concluded, by means of musing and reflection. When undergoing an experience, events may move too quickly or there may be too many distractions for the reflection-in-action process to be effective. However by subsequent analysis of a past occurrence, it may be possible to make sense of it and derive learning from it. This process of reflection-on-action may result in new acquired behaviour or an adjustment to an existing pattern of action (Schön 1983).

Prospective learning takes place in anticipation of future experiences. This may be a result of interaction with others who have undergone the experience and are able to describe it. Alternatively the subject can perform personal research or use imagination to prepare him- or herself for the anticipated event, and develop a strategy to manage it. The following table illustrates the chronology of learning:

Past	Present	Future
Retrospective learning	Concurrent learning	Prospective learning
Reflection Interpretation	Observation Adjustment	Anticipation Imagination Visualisation

Figure 2.7: The Chronology of Learning

2.2.4 Mental Models

The extent to which a person learns in a given context is strongly influenced by factors that are internal and individually unique: each individual brings with them a belief system that has been shaped by their own personal mental models (Johnson-Laird 1995, 2004; Resnick 1989; Senge 2006). Mental models relate to preconceptions that people may hold about the way things are and the way things work. Johnson-Laird (1995: 999) defines mental models as "...the natural way in which the human mind constructs reality, conceives alternatives to it, and searches out the consequences of assumptions". Senge (2006) takes a broader view and considers them to be not only formulations brought forward from prior personal experience, but that they may also be derived from perceived wisdom and established cultural norms, and that they may manifest themselves in the commercial world as accepted business practice.

When the individual acquires new knowledge in the process of learning, the frameworks that they bring with them influence the way that they interpret and make use of that new knowledge; mental models determine their reaction towards different subjects, events, and situations (Resnick 1989). On the negative side, the reaction may be incomprehension or rejection or apathy, in which case the learning opportunity is lost. If the knowledge fits within an existing framework and can be accommodated within a current frame of reference, then the outcome may be a honing of existing knowledge or skill. If, however, the new knowledge contradicts a mental model, and the person is able to make sense of it and construct a new or modified framework, then the full learning opportunity can be realised.

A person's receptiveness to new knowledge is believed to be strongly dependent on whether they believe themselves to have possession of their own learning, or whether they consider it to be the responsibility of others (Resnick 1989: 9). One of the important drivers in the assignment of responsibility for learning is the concept of locus of control. This is a psychological concept originally theorised by Rotter (1966) to represent how a person's decision making ability is influenced. Essentially, those who make choices primarily on their own are considered to have an internal locus of control, while those who make decisions based more under influence from others are said to have an external locus of control (Srivastava 2009). Translated into the project context, those with an internal locus are likely to believe that they can control the project destiny, whereas individuals with an external locus feel that they have little or no control over events and circumstances that affect their situation (Rasch and Tosi 1992).

Mental models may be very inhibitive of the learning process if they are outdated, or inappropriate, or too deeply entrenched, and never questioned (Senge 2006). We are all captives to a greater or lesser extent of our mental models. Those things that we have learned and reuse unwittingly in a new context can either be very powerful and effective, or alternatively, restrictive and inhibiting if they are less than appropriate and used without challenge. Mental models can enable individuals to react confidently and swiftly to a challenge by drawing on an established set of assumptions that addresses it: they are the end-product of learning. They can also become areas of familiarity and comfort, and hence less than effective if left uncontested for too long. They can be a major impediment to learning if the model determines that a particular subject or situation is out of scope for reasons of complexity or irrelevance, or constitutes a threat.

Johnson-Laird (2004: 179) believed that mental models are a powerful driver of the human condition, and summarised them thus:

> *What is the end result of perception? What is the output of linguistic comprehension? How do we anticipate the world and make sensible decisions about what to do? What underlies thinking and reasoning? One answer to these questions is that we rely on mental models of the world. Perception yields a mental model, linguistic comprehension yields a mental model, and thinking and reasoning are the internal manipulations of mental models.*

The challenge for the individual is to recognise the need to inquire about and contest existing mental models. This leads to the key concept of "openness": to be truly effective at learning, the individual must recognise the need to be open to new suggestions, criticism, and opportunities. This may represent a major cultural shift for an individual, but without this receptiveness to consider or accept input that challenges existing mental models, the learning process will be restricted. A failure to self-examine one's mental models can lead to staleness or inertia of one's personal vision and, within the project dynamic, a serious impediment to learning.

2.2.5 Absorptive Capacity

There are significant disparities between the speed and efficiency with which people acquire and process new knowledge. The more efficient learners appear not only to have a specific intention to learn, but may also have an effective understanding of their own learning capabilities. This has given rise to the theory of metacognition or meta-learning, which is defined as an individual's awareness of their own ability to acquire knowledge and to control their learning (Biggs 1985). The theory posits that every experience that involves learning may influence and improve performance in subsequent learning tasks. However, Cohen and Levinthal (1990) maintain that improved performance may be related more closely to the accumulation of prior knowledge rather than because an individual knows how to learn. These authors proposed the theory of absorptive capacity, in which an individual's accumulated prior knowledge increases both the ability to absorb new knowledge and the ability to recall and use it. Moreover, the effectiveness of the absorptive capacity in acquiring new knowledge or problem-solving skills is strongly related to the intensity of the effort involved in gaining the prior knowledge. The absorptive capacity theory applies also at the organizational level: a firm's ability to obtain and exploit new techniques is

dependent on past investment in acquiring relevant prior knowledge and experiential frames of reference.

2.2.6 Single-loop and Double-loop Learning

Argyris and Schön (1974) observed the ways in which people use their mental models to develop their "loop" theory of learning. The action people take when reacting to certain situations is based on their theory-in-use contained within their mental map. When the person observes the consequences of an action there may be one of three potential outcomes:

- The consequence is as expected or as intended: this will often be perceived as a confirmation that the theory-in-use is valid.
- The consequence is unexpected and/or the outcome is a failure: in this instance the person may seek another theory within their scope of reference and resolve to use this as a substitute. This is a valid error-correction process, and is termed single-loop learning; however the new learning generated may be minimal.
- The consequence is unexpected and/or the outcome is a failure, but in this instance the person may seek to question the underlying parameters that gave rise to the theory-in-use and its effect. By means of this critical scrutiny, a new approach or theory may be constructed and new learning may be generated. This is termed double-loop learning.

The two levels of learning can be represented as follows:

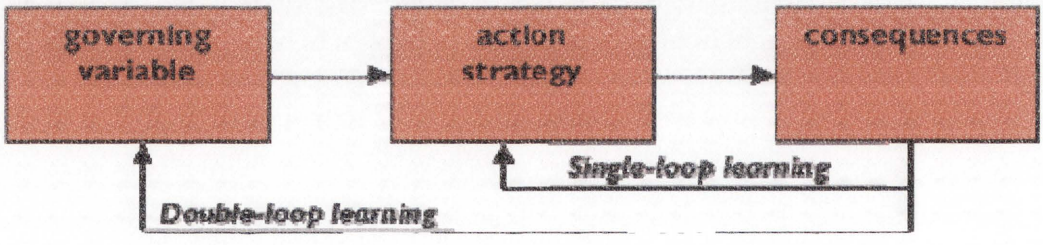


Figure 2.8: The Loop Theory of Learning

(Smith 2001: 5)

The action strategy represents a person's attempt to achieve their goals, by referring to their regular values and frameworks. The single-loop response represents a search for a solution within a standard frame of reference, that is, by adopting a low-risk controlled approach. The double-loop reaction involves questioning or challenging the governing

variables or unconscious assumptions within which a person normally operates. When the double-loop response is used there is a powerful potential for the individual to adopt new strategies and structures and gain significant new learning. Double-loop learning therefore offers a person a powerful means to create new mental models and influence others, albeit by moving outside the zone of comfort and taking on some element of personal risk by operating on the border of incompetence (Rogoff 1990; Smith 2001).

2.2.7 Cognitive Theory of Learning

Cognitive theory is a different approach to the understanding of the learning phenomenon, but it can readily be related back to the key concepts of mental models and motivation. It attempts to explain human behaviour by understanding their thought processes: the assumption is that humans are logical beings that make the choices that make the most sense to them. Cognitive theory identifies three aspects of learning (Resnick 1989):

- *Knowledge construction*: knowledge of itself does not generate learning. Recording information may be a useful way to initiate knowledge creation, but does not of itself produce learning. Knowledge must be internalised and interpreted and the individual must be able to relate to the knowledge in the sense that it must be perceived to be interesting and relevant; that is, there must be *motivation*.
- *Knowledge dependency*: Resnick, quoting Glaser (1989: 2) suggests that the more knowledge that people acquire, the more their powers of reasoning expand, and the greater their capacity to gain more knowledge. Learning then depends on expansion and transformation of knowledge that has been previously acquired. There is also a strong suggestion that those that are receptive to learning gain increasingly more knowledge and better powers of reasoning. The tendency to learn effectively is affected both by prior knowledge and by the individual's learning style. This concept relates closely to the theory of absorptive capacity described earlier.
- *The situated context*: the learning environment is known to be strongly influential in the effectiveness of the learning process. Resnick (1989) observes that facts acquired in isolation from an experiential context are known to be

rapidly diffused. Skills and knowledge are best retained when acquired as part of an experience situated in the environment in which they are practiced.

2.2.8 Motivation to Learn

An individual's personal motivation to learn, to develop and to achieve is a key driver of the learning process (Harrison 1997; Resnick 1989; Rogoff 1990; Senge 2006). A person may have a mental model that includes assumptions about his/her capacity to learn, or the intention to learn may develop either through being exposed to motivational leadership, or as a result of an internal change of mind-set. A person's attitude towards learning is known to have a direct influence on their ability to absorb and process new knowledge (Resnick 1989). The greater the personal incentive to acquire knowledge, the more effectively that individual will learn (Harrison 1997). When individuals engage in social activity they consciously or unconsciously select those aspects that claim their attention and may ignore others. This is dictated both by the structure of the social activity and the appropriation of the material and its interpretation by the individual (Rogoff 1990).

An individual's vision of what he or she wants ultimately to attain, combined with a clear image of current reality, provides a force of creative tension (Senge 2006). This tension seeks its resolution in the drawing of current reality towards the vision. The motivated individual constantly reassesses and clarifies both their vision and their perception of current reality. The key to closing the differential between current reality and personal vision lies in inquiring, challenging, and learning. The person that is inspired to learn is not deterred by mistakes or even by failure, but sees them as learning opportunities and enriching experiences (Senge 2006).

2.2.9 How the Individual can create Personal Value

We are moving from an industrial society to a knowledge-based society, where individuals are valued for the knowledge contribution they can make to an organization (Cross 2007; Cunningham et al. 2004; Raelin 2008). Cunningham et al. (2004) contend that the sum of a person's value can be expressed as a formula:

$$U = G + P + L$$

Where:

U is the individual

G is the genes with which that person was born

P is the physical development that they have undergone

L is the sum of all that they have learned

Of these factors, "L" is the most personally controllable. To an individual, therefore, the extent to which they can increase the value of "L" will largely determine their worth in the workplace, subject to influences such as mental models, motivation, and locus of control.

Cross (2007) however, envisions a stage beyond this, and perceives value based on an individual's membership of social networks. Individuals intuitively operate within networks: we are all part of many networks both in the social or business context. Humans instinctively create them; they understand that somehow a group of like-minded people can achieve far more than individuals. However it seems that until fairly recently, organizations only prized an individual's personal abilities and ignored those other attributes: those related to his/her support systems and contacts (Cross 2007). Today's worker is more likely to be valued not just for what they know, but also because they know where to look or whom to ask to find vital pieces of information. In the project situation, in which human resources are typically limited, using people's contacts to the fullest is particularly important. Today's workers are (or should be) knowledge workers: they should be encouraged to think, and, in particular, to work and think collaboratively with their co-workers. As observed by Gee et al. (1996: 58):

> *...in the new capitalism it is not really important what individuals know on their own, but rather what they can do with others in a collaborative way to effectively add 'value' to the enterprise...*

The day of the manager directing the activities of his minions from above is receding in favour of the "chief visionary" leading his/her team in creative dialogue. A senior executive at Google Inc. estimates that a motivated and dynamic staffer can be 250 times more productive than an average performer (Cross 2007).

2.3 Learning within the Project Context

In this section of the Literature Review I have examined the relevant published material relating to the phenomenon of individuals learning in a group environment, in some instances within the more general sense of team learning, and where it is available,

specifically within the project context. If we hypothesise that effective learning is an essential focus of the innovative and successful organization of today, then it follows that the successful information technology project must also be both a recipient and a provider of learning (Sense 2003). Projects exist as a community within the sponsoring organization, and are not necessarily constrained nor influenced by the culture of their parent. They exist within an organization, take their life from it, but may have a management and cultural regime that is quite distinct (Bresnen et al. 2005). Projects should be perceived as vehicles for learning, and if learning can be actively managed and maximised, substantial benefits can accrue to both the individual and the organization (Sense 2003).

2.3.1 Cognitive Apprenticeship

Cognitive apprenticeship is the concept of the more junior team members learning from the leadership and/or the more experienced members of the team (Collins et al. 1989). It is clear from the reviewed material that the most effective way to acquire the skills to become a valuable project team member, or indeed a leader, is to gather the required experience at first hand. This is one of the important aspects and likely types of learning that I need to identify in my research.

Apprenticeship has traditionally been used to transfer the knowledge and skills involved in expert practice. Although formal apprenticeships have now all but been abandoned, Collins et al. (1989: 453) observe that:

> *Even today, many complex and important skills...are learned informally through apprentice-like methods – that is...observation, coaching, and successive approximation.*

The key to apprenticeship learning is that the knowledge and skills that the novice wishes to acquire can be observed and experienced in the social and functional context in which they are practiced. Apprentices learn through a combination of observation, coaching and practice.

Observation is the first and most basic stage of the process, where the novice perceives the master using his or her skills to execute an expert practice. Coaching is the stage in which the master assists the novice to perform the practice supported by "scaffolding", which is guidance and help that is progressively withdrawn as the student gains in confidence and ability. The practice stage is where the novice executes the skill

successfully with the master's involvement gradually reducing to zero (Collins et al. 1989).

Operating within the relevant social context is the essential part of apprenticeship. In the IT project context, the domain of learning will include many exponents of the target skills, probably at different stages of the learning cycle, and there may be several models of expertise to observe. It is particularly pertinent to my research to ascertain the extent to which observation, coaching and practice are apparent in the project setting.

Of particular relevance to my research is Vygotsky's (1978) concept of coaching within the 'zone of proximal development' (see figure 2.9). When a person operates within their zone of competence, there is a sense of confidence and comfort that enables them to perform effectively in that role without the need for coaching or encouragement. If however that person is required, or chooses, to operate as a novice within a zone of unknown competence, then guidance or coaching by an expert will greatly enhance the learning experience. Vygotsky (1978) identified the significance of the middle zone of proximal development when a learner takes on a stretch assignment that moves them into actions or roles that they have not previously performed. The availability of trusted support in this middle zone may stimulate the individual's growth and cognitive development into the new role; without the availability of this support there may be a reluctance to assume the risk of failure or humiliation (Mooney and Dovey 2008).

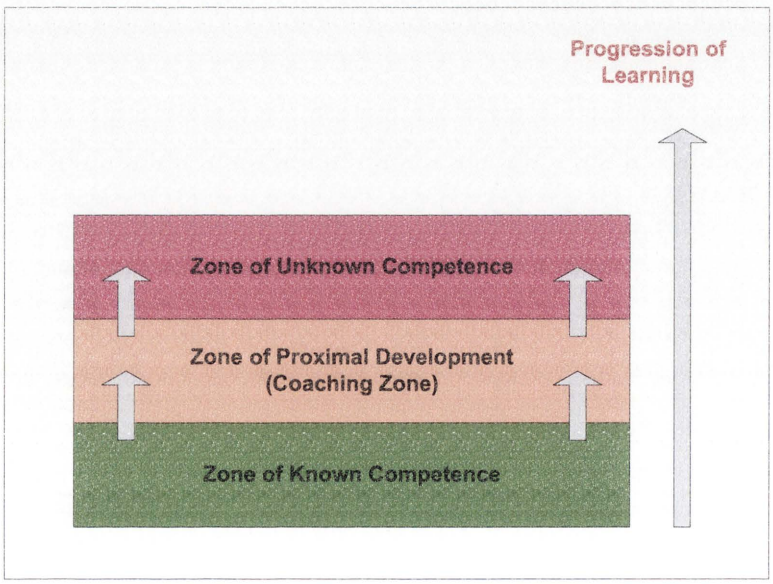


Figure 2.9: Vygotsky's Zone of Proximal Development

(Mooney and Dovey 2008: 56)

The importance of the relationship between expert and novice was espoused by Rogoff and Gardner (1984: 97) who recognised the need for an 'intelligible context of interaction' between the guider and the guided: the effectiveness of the transference of knowledge and guidance obviously greatly influences the learning outcome for the novice. Ideally the level of scaffolding is decreased as the learner gains proficiency. Interestingly, both teacher and learner may be quite unconscious of the technique being used: in the business environment the teacher may be concerned primarily that the job should be completed in a satisfactory way, and may also be concerned with reducing the load on himself or herself (Greenfield 1984). Also relevant is the concept of 'proleptic instruction' in which the novice physically carries out the new task under expert direction in anticipation of a full transfer of responsibility (Rogoff and Gardner 1984).

2.3.2 Situated Learning

Situated learning takes place in the performance of the task in the context in which the learning will be applied (Lave and Wenger 1991; Sense 2003). The opportunities for situated learning that may take place within projects can vary between extremes. At the minimum learning end of the scale, a project may be planned in minute detail, with all known risks and contingencies taken into account. This will tend to limit the opportunities for situated learning, because there will be limited scope for improvisation or experimentation. This is, however, a very legitimate approach to the management of particular types of project, because it appears to provide maximum certainty and minimum risk. Nevertheless, it is an exceptionally rare project that does not encounter some unexpected challenges during the course of its lifecycle.

At the other end of the spectrum, a project may deliberately set out to tackle the unknown, and allow learning to take place as the project progresses. If the project is sufficiently novel, the amount of planning that can be undertaken in advance may be limited. In novel projects there may be too many "unknown unknowns", or there may be too much complexity, or both (Loch et al. 2006). It can be a mistake to plan an innovative project too rigorously, because the unknowns and the complexity may very quickly invalidate the plan, but the project team may find itself still committed to attempt to deliver against it. There is, naturally, every level of gradation between maximum and minimum planning, and understanding the different types of projects and associated processes forms part of my research.

Loch et al. (2006: 103) define situated learning in projects as:

> *...the flexible adjustment of the project approach to the changing environment as it occurs; these adjustments are based on new information obtained during the project and on developing new – that is, not previously planned – solutions during the course of the project.*

Each new project activity yields new experiences and knowledge that can be re-used to inform later stages of the project so that the project plan and resource requirements can be modified appropriately. The challenge to the project is to recognise the significance of the new experience, draw the correct inference, and make the relevant ongoing adjustments. The more developed the learning attributes are within the project, the more effectively this process is likely to function.

Sense (2007) encapsulated the phenomenon of learning behaviour within projects into five sociological constraint/enabler elements (see figure 2.10).

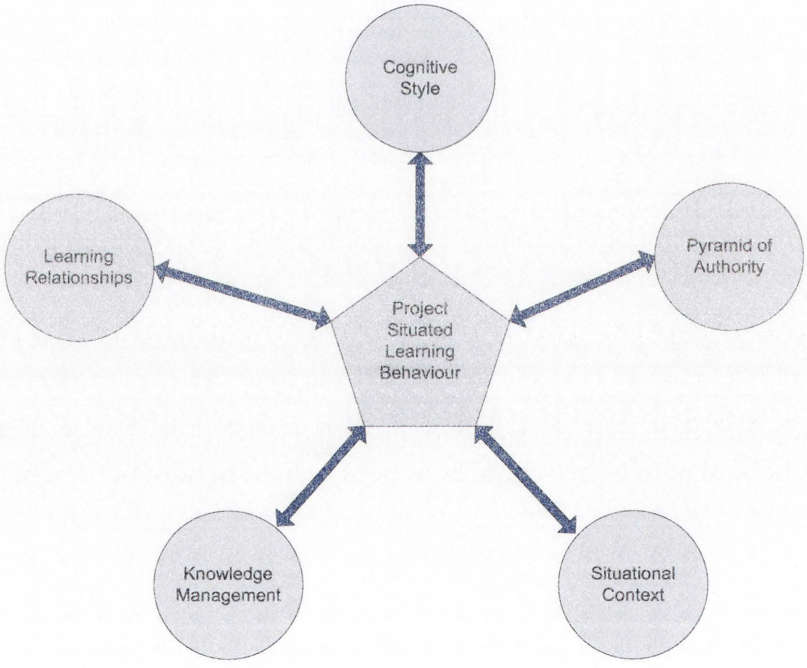


Figure 2.10: The Project Learning Pentagon

(Sense 2007: 64)

An individual's *cognitive style* reflects how they make sense of their world, and how they interact both with information and with others. It is closely linked with the

phenomenon of learning style, previously discussed in section 2.2.2. Both of these style constructs interact with, and form part of, what is generally termed "personality" (Sadler-Smith 1999). The concept of *learning relationships* is concerned with the interaction between people working in close proximity: these relationships are essential to knowledge creation and diffusion. In particular, effective socialisation of tacit knowledge depends on relationships that are open and amicable, in which people are prepared to share in an unstructured and spontaneous way.

The *pyramid of authority* relates to the different levels of authority and power that are possessed, albeit temporarily, by the individuals within a project team. Authority may be formal or technical, real or perceived; and the exercise of that authority and the individual's position within the pyramid will influence the situated learning behaviours and outcomes. This leads into one of the inescapable constituents of the project situation, that of politics:

> *Project teams typically consist of members that normally would belong to...and be influenced by other communities of practice within an organization and beyond it. This commingling of participants around a project opportunity suggests that there are unavoidable and varied political interests present...(Sense 2007: 111)*

These varied political interests are likely to manifest themselves in the exercise of influence, nepotism, discrimination, charisma, friendship and ambition (Wenger 1998). The ability of an individual either to wield political power, or be influenced by it, will clearly have a positive or negative impact upon their learning behaviour and outcome. There are major stimulants to political activities within projects, based on the need to negotiate for resources, the requirement to cultivate many methods of influence to obtain the desired outcome, and a possible lack of formal hierarchical power (Sense 2007). Project participants should be aware of the inevitability of having to deal with political currents. A failure to understand, or to become negatively involved, in politics may erode the individual's learning opportunities, whilst a healthy recognition of the prevailing political dynamics may engender significant creative energy leading to a rich learning experience.

The two concepts of *knowledge management* and *situational context* form the infrastructure to the concept of project situated learning. There are two distinct aspects to knowledge management: the physical side of databases and tools to contain and manage the information, and the social and cultural factors that combine to allow people

to contribute to, and make sense of, the knowledge that is generated within the project setting. The situational context likewise has both a physical and a social perspective: there is the physical way the project is organized that includes the location and the provision of meeting spaces; and there are social considerations such as the composition and structure of the project team, the governance model, and provision of opportunities for reflection and learning.

2.3.3 Single and Double-loop Learning in Projects

Everyone expects projects to encounter issues and problems during the course of their lifecycle (Loch et al. 2006). Many project strategies include contingency plans that are invoked when something untoward occurs, and this is recognised and advisable practice. The contingency plan may give rise to a variation in specific actions, but not necessarily an alteration to the overall strategy. The contingency plan is therefore a concrete example of a single-loop learning response. By contrast, the principle of double-loop learning implies not only a variation to the project activity, but also a reconsideration of the policies, plans and assumptions that govern the project. Loch et al. (2006) recognise two types of double-loop learning that can occur within the project situation: improvisation and experimentation. A driver for the use of improvisation would be where an unexpected and unplanned situation arises, causing the project to improvise a solution or workaround. The more uncertain and innovative the project, the more important it becomes to improvise effective solutions in real time. The resolution, when successfully implemented, may then become adopted by the project as part of its planning and governance model. "Improvisation implies creative variation within a known range" (Loch et al. 2006: 115).

Where a more radical approach may be required, it may be appropriate to drive learning by means of experimentation. In the case of experimentation, the learning takes the form of a trial and error approach. Provided that the need for such trials can be anticipated, it is obviously appropriate to make provision for experimentation within the project schedule and action plan. One approach to conducting experiments is the Plan-Do-Check-Act (PDCA) cycle shown in Figure 2.11:

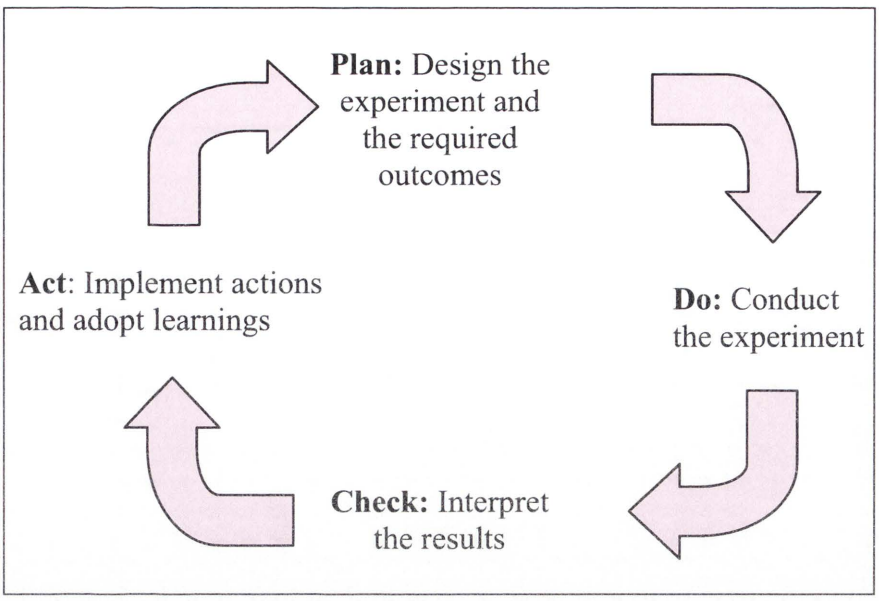


Figure 2.11: The PDCA Experimentation Cycle

(Loch et al. 2006: 116)

To gain maximum learning benefit from experimentation within projects, Loch et al. (2006: 119) advise the following:

> *Be prepared for experiments to fail: failure and recovery is a necessary part of the cycle...plan the experiments as early as possible within the project life-cycle: learnings are more valuable the earlier they are available...organize the team for experimentation: ensure that information is widespread, and maintain the dialogue so that maximum input and feedback is generated.*

2.3.4 Progress versus Learning

Loch et al. (2006) observe that there may be a trade-off between project progress and the learning opportunity that it presents. Where a project does not especially involve uncertainty, novelty or ground-breaking technology, the opportunities or requirement for double-loop learning may be limited, and we should expect progress to be unimpeded by improvisation or experimentation. Conversely the novel project provides greater learning potential at the expense of advancement. The following graph shown in Figure 2.12 illustrates the trade-off between project learning and rate of progress: the more the project team becomes involved with improvising and experimentation, the greater will be the potential learning experience, and the more protracted the progress towards completion.

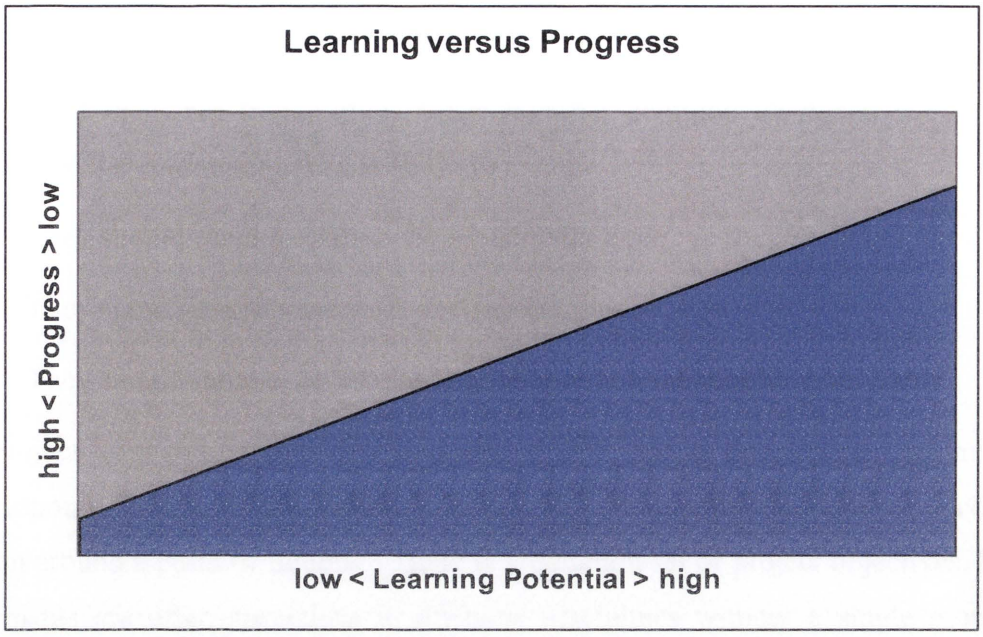


Figure 2.12: The trade-off between Project Learning and Project Progress

(Adapted from Loch et al. 2006: 117)

The inference drawn from this is that the more innovative the project, the more difficult it is to formulate a cogent project plan, and the more the project will depend upon learning to inform the future direction of the project. Loch et al. (2006: 118) contend that:

> *Implementing a learning strategy in any project is not easy. It is human nature to want a plan and milestones by which it is to be measured. However...a project plan should not be seen as an end in itself: it is always the means to an end. The ultimate objective, whatever it is, should always be at the forefront of the project team's mind.*

This highlights one of the challenges of the innovative project. Whilst it may represent an outstanding learning opportunity for the team members, there must be recognition that there is an objective in view and there will be milestones to meet.

2.3.5 The Project as a Community of Practice

Some of the literature discusses whether a project can be construed as a Community of Practice or COP (Seely Brown et al. 1989; Sense 2003). A definition of a COP is the process of social learning that occurs when people who have a common interest in some subject or problem collaborate to share ideas, find solutions, and build innovations. It is through the process of sharing information and experiences with the group that the members learn from each other, and have an opportunity to develop themselves

personally and professionally (Lave and Wenger 1991). A COP can be positively identified if there are found to be three essential common elements that bond the members of the community (Sense 2003: 7) :

- They should share a concern for a particular topic
- They should possess mutually defined identities
- They should interact on an ongoing basis over a substantive time frame

The project team can be considered a form of COP, but its development is limited by the temporary nature of the project lifespan, and (frequently) the lack of a common passion around a point of interest. There is a common set of project objectives, but the participants are often specialists in different disciplines without a single motivating focus. Team members may therefore be participants in other external COPs, while the project itself may function more as a collection point: a social group with which its members identify. Even if we do not subscribe to the notion that the project is a COP, the members of the community are associated by the knowledge that they share, the tasks they perform, and the culture that has developed out of the particular environment in which it operates. The cultural practices, such as the terminology and the behavioural norms that operate within the group, are rapidly assimilated by the members. "Learning is inseverably bound up with the social group in which it takes place; learning is...a process of enculturation" (Seely Brown et al. 1989: 33).

A COP has a primary output of, and becomes a repository for, artifacts and tools relating to the common interest. In the case of the information technology project this implies documentation, techniques, and software tools that contribute to the project repertoire. Where project participants hold membership of relevant external COPs, the enterprising and learning-aware leader will encourage the exchange of knowledge between members. Project leaders need to understand the strengths, experiences and interests of their team members and decide how best to share and develop the knowledge. Cultures are reinforced by the evolution of belief systems and narratives, which may be encapsulated in the form of stories which become part of the collective wisdom (Seely Brown et al. 1989). The development of story-telling and conversational norms enables the growth of the phenomenon of group learning, which is characterised by:

- Collective problem solving brought about by synergies and insights

- Observing and understanding multiple roles
- Recognising ineffective strategies
- Development of collaborative work skills

It is therefore significant to the research that projects be assessed as to the extent to which they meet the criteria of being a community of practice.

2.3.6 Learning and Project Leadership

The risk as a project leader is that one becomes trapped in a pattern of working, which may not be appropriate to the current project, or the way the profile of the project may have changed (Obeng 1994). This author maintains that projects can only succeed if the project leadership constantly reviews their goals; since projects are always intrinsically different and subject to constant change, there are continually new things to learn about them. During the course of its life-cycle, many aspects of the project change: the nature of the work, the composition of the team, the next milestone, the attitude of the stakeholders, and the perception of what constitutes success.

He also observes that there is a tendency for successful project leaders to become bound by their own success: they forget how to learn:

> *What makes learning even more difficult is the fact that the more successful you have been in the past, the more you are hindered by past habits you have built up (Obeng 1994: 118)*

In order to counter this creeping sterility, Obeng (1994) proposes that leaders must recognise the importance of seeking a second opinion from peers and colleagues. After experiencing something unusual within the project environment, there may be an opportunity to seek counsel from a colleague. This person may have experienced something similar before, or can provide some inside information on how to deal with it. The implication is that the really effective project leader constantly uses all his or her sources and contacts to enhance his or her learning. Drawing on his personal experience, Obeng (1994) developed a project manager's version of the learning cycle, shown in Figure 2.13:

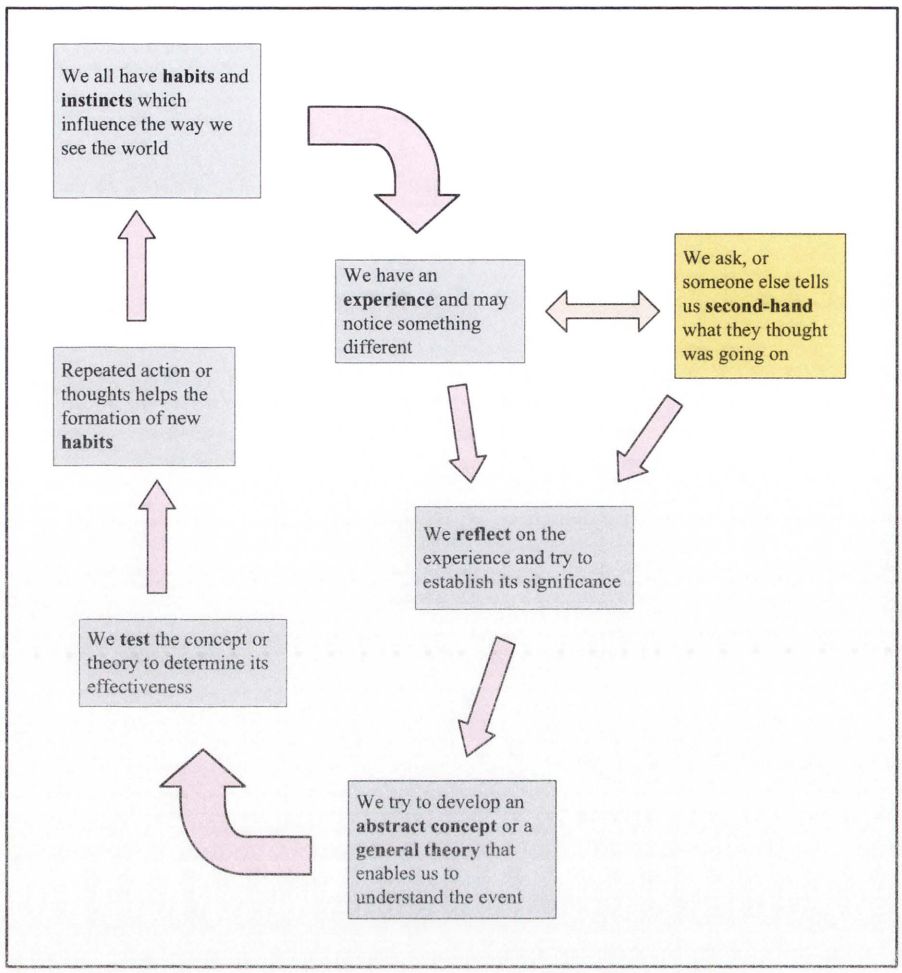


Figure 2.13: The Project Manager's Learning Cycle

Adapted from Obeng (1994: 105)

2.4 Organizational Learning

The intention of this part of my literature review is to understand how the many researchers and observers believe that learning organizations are created, to discover the means by which the project can influence organizational learning, and also to assess whether the project itself can operate as a nascent or junior form of learning organization.

Every organization is concerned with the problem of how to ensure its long term relevance and survival. The performance and cost challenges for business are relentless in the global economy, and organizations find that, in order to remain competitive, they need to be more innovative and flexible than ever before. This need for organizational reinvention has given rise to such initiatives as Total Quality Management (TQM) and Business Process Reengineering (BPR), however there has been an acknowledgement

that these programmes are difficult to implement and have failed to deliver ongoing benefits (Farago and Skyrme 1995; Kotter 1996). There has also been a realisation that it is not sufficient to recognise the need for change and execute it once. The modern business environment is fast-changing and unforgiving; the organization that wishes to survive and prosper never relaxes, but is constantly seeking ways to improve products, processes, and performance (Argyris and Schön 1978; Denton 1998; Senge 2006). The relevance to my thesis is that the information technology project is one of the important means to drive organizational improvement and change, and this further emphasises the importance that an organization should assign to learning how to deliver consistently successful project outcomes.

2.4.1 Defining the Learning Organization

The concept of the learning organization has developed from the recognition that organizations need not only to reinvent themselves to face the future, but to create an internal culture that is constantly innovating and improving and receptive of change. Senge (2006: 3) defines the learning organization thus:

> *Organizations where people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning to learn together.*

Alternatively, Farago and Skyrme (1995) identify the essential characteristics of the learning organization as those that:

- Are adaptive to their external environment
- Continually enhance their capability to change and adapt
- Develop collective as well as individual learning
- Use the results of learning to achieve better results

The key issues are that workplace learning must be ongoing; today's workplace must encourage free-thinking and innovation, and must encompass a shared vision towards which everyone strives. Such attributes are now commonly viewed as fundamental goals to which business should aspire, and, importantly to my research, they are also entirely relevant in the project environment.

2.4.2 How Organizations Learn

It is recognised that organizations can learn only through individuals who learn. Individual learning does not guarantee organizational learning, but without it no organizational learning can occur (Argyris and Schön 1978; Senge 2006). This fundamental concept was summarised by Argyris (1992: 8) as follows:

> *Organizations do not perform the actions that produce the learning. It is individuals acting as agents of organizations who produce the behaviour that leads to learning. Organizations can create conditions that may significantly influence what individuals...produce as action to solve a problem.*

The key then, is to create within an organization those conditions that will promote individual learning, and then to ensure that the learning is shared such that it becomes part of the operational culture. The literature proposes a number of "disciplines" that collectively are necessary to create a Learning Organization, which are summarised in the following sections.

Providing a safe learning environment

Since organizations learn only vicariously, by means of individuals that learn, it is clear that organizations should provide an environment in which personal visions are encouraged and promoted (Senge 2006). People need to feel safe to challenge, to inquire and to learn. Group members should not only be able but be encouraged to ask "dumb" questions (Marquardt 1999: 20). In particular, the individual must feel sufficiently secure that he or she is able to make mistakes without incurring undue blame or penalty. However this encouragement must be provided in such a way that the individual does not feel threatened or coerced: personal vision is exactly that, and cannot be corporatised. The organization should take steps actively to promote a climate of openness and trust, diversity of thought should be encouraged, and individual creativity and imagination should be stimulated (Farago and Skyrme 1995). Organizations that wish to embrace learning need to recognise that with the enhanced freedom and openness towards their personnel there is a need to be increasingly tolerant towards those same people making mistakes (Beard and Wilson 2002). However, the extreme rarity of organizations that genuinely encourage innovation and actually celebrate failure is highlighted in the account of the culture of creativity at the remarkable American company W.L Gore & Associates (Deutschman 2004).

Organizational Mental Models

It is important to recognise that mental models exist on two levels (Argyris 1992; Senge 2006; Senge et al. 1999). They may be organizational, in which case they may be part of an organization's accepted way of doing business: that is, a cultural norm. Or they may be personal: that is, part of an individual's psyche, a learned expectation or behaviour pattern. The challenge for both individuals and organizations is to recognise the need to inquire about and contest existing mental models. This leads again to the key concept of "openness". To be truly effective at learning, the individual or the organization must recognise the need to be open to new suggestions, criticism, and inquiry. This may represent a major cultural shift for an organization, but without this receptiveness to consider or accept well-intentioned input, the learning evolution will be still-born.

Argyris and Schön (1978) refer to "balancing inquiry and advocacy" in which an ideal learning environment is generated by presenting and measuring viewpoints in a spirit of open discussion and inquiry. The objective is to create or modify an organizational mental model so that the best possible decision is reached for a given situation. Consensus is not essential; provided that a good outcome is achieved and all have had an opportunity to provide worthwhile input in a setting conducive to open discussion; this very often leads to a wider endorsement of the decision than the (potentially) more coercive "agreed" outcome.

Shared Vision

Shared vision is an essential element of the learning organization (Argyris 1992; Senge 2006). This is not necessarily the "published" vision that is featured prominently in organizational literature, but may be an intrinsic vision shared by members who are committed to achieving something together. In order for a vision to be shared, there must be a common sense of purpose, and a general belief that the organization's objectives are valuable and worthwhile. The vision may be centred on a charismatic and inspirational leader at the head of the organization; although experience has shown that it may originate within a subset or division and grow from below. Ideally, the leadership should dedicate time to developing a deep understanding of their environment; they should make widespread use of internal and external sources to construct a realistic vision for the future (Farago and Skyrme 1995).

Senge (2006), quoting the organizational consultant Kiefer, identifies different levels of engagement with a shared vision:

> *Commitment* where people take responsibility for creating and propagating the vision, remain its committed advocates, and strive to achieve it
>
> *Enrolment* where people are strongly connected to the vision and want to achieve it, but are not the creators of it
>
> *Compliance* where people understand the vision and are prepared to go along with it

Below this there are levels of *non-compliance* and *apathy* where people do not understand the vision and merely follow instructions or do the minimum to avoid removal. Organizational leadership needs to understand that, in order to create an effective learning organization, the objective is to generate as many committed and enrolled people as possible. However, commitment or enrolment cannot be compulsory nor legislated: it must be a matter of free will. If the vision is sufficiently strong and well-grounded engagement levels can grow organically.

Team Learning

There is wide recognition that the creation of teams and taskforces within the organizational structure can be the means by which significant learning can be generated and maintained (Coles 2004; Lipshitz et al. 2007; Senge 2006). This is an area in which there is clearly a major interconnect between the notions of organizational learning and project learning. The only real difference between a functional team operating within an organization and a project team is likely to be the duration of the team's existence.

The team effect comes into play when there is alignment of team members, who may have different skills, various modus operandi, even opposing personal interests. But when they are aligned into an effective team, the whole may be considerably greater than the sum of the parts. Provided that there is a common purpose, and an understanding by team members of the need to work in harmony, the skills may be found to be complementary rather than opposing. Senge (2006: 220) identifies three essential elements in the makeup of an effective team player:

- A preparedness to work closely and productively with others

- A willingness to share information and to use one's own learning and knowledge for the benefit of the team
- A readiness to contribute to team dialogue, discussion and decision-making

Argyris (1992) identifies limitations to learning within the team environment, where he observed how management rigidity and conflict may impede team learning. Conflict may be unproductive if, at one extreme the team permits excessive compromise so as to avoid argument or discomfiture, or at the other extreme, the loudest and strongest personalities habitually dominate discussion. This same phenomenon has been observed by Constantine (1995: 7) who writes specifically in the context of information technology:

> *Consensus design and decision making is at its best when the solution derives from the talents of all team members and reflects the experience, creativity, and critical thinking of all, not just an average of their contributions, but a genuine synthesis that combines their best. When group leaders, however talented and brilliant, push their own agenda, the quality of teamwork goes down.*

Team learning requires practice, and it is self-evident that the longer a team functions together the more effective the team dynamic will become. The IT project team with its (relatively) short-term existence may present a limited opportunity for full development of the team learning phenomenon. Senge (2006: 221) provides another caveat:

> *Despite its importance, team learning remains poorly understood. Until we can describe the phenomenon better, it will remain mysterious. Until we have some theory of what happens when teams learn (as opposed to individuals in teams learning), we will be unable to distinguish group intelligence from "groupthink", when individuals succumb to group pressure for conformity.*

Discussion and Dialogue

The means by which collaborative teams make decisions is, naturally, by meeting together as a group. It is important that a team has available to it a meeting space large enough to accommodate the entire group (Constantine 1995). There should be recognition that there are two fundamentally different forms of discourse, discussion and dialogue (Senge 2006). Discussion is a form of communication in which a subject is analysed and all participants are invited to contribute their knowledge and opinion. Fundamentally this is a well-understood and commonly used practice. Discussion is commonly led by a senior person. Senge however suggests that it is normal for the view

of the strongest player(s) to prevail, and therefore that as a team learning technique it has limitations. It remains however an essential part of the team dynamic when agreement and decisions must be reached.

Dialogue is a more powerful form of discourse in which issues are explored from many different viewpoints, with the essential prerequisite that all participants should suspend any preconceptions or assumptions. The intention is to generate a stream of collective thought which is contributed and developed by all participants. The outcome is not necessarily a consensus. Bohm (1996) identifies three conditions necessary for effective dialogue:

Suspension of assumptions:

> This implies the recognition of those things that are assumptions and avoidance of presenting them as doctrine or unquestionable fact. The objective is to draw on the experience and knowledge of the participants and to encourage the questioning of all preconceptions.

Colleagueship:

> For dialogue to be truly effective, all elements of hierarchy and seniority should be effectively suppressed. It is difficult to achieve this in a hierarchically-structured enterprise. Additionally, leaders may feel the need to defend their senior position, while more junior members may feel inhibited in their contribution. However it is essential that all contributors feel secure and unthreatened within the dialogue situation.

Facilitation:

> The key to effective dialogue is to ensure that it is effectively facilitated by an individual who understands the need for participants to suspend assumption, and who can ensure that the flow of collective thought is maintained. The key skill is to maintain the dialogue on all sides without hampering or imposing any undue influence on the proceedings. The facilitator and all participants should be encouraged to maintain at all times a spirit of inquiry.

Creative Abrasion

A significant contributor to team learning may be the deliberate population of teams with apparently competing or opposing personalities (Leonard and Straus 1997; Senge

2006). There should be an understanding that conflict can be a great driver of creative thought and, when properly understood and managed, need not be a negative force. Managers who avoid disputes, and value only their own opinions, may be inclined to staff their team with clones of themselves: this approach is likely to inhibit creativity and learning. The more adventurous leader welcomes diversity of cognitive process within his team, and invites disagreement (abrasion) in the interests of thoroughly exploring options and deriving optimum outcomes. The output of "whole-brained" groups consisting of both left-brained (logical) and right-brained (feeling) people is claimed to be significantly better in terms of creativity and problem-solving than that produced by groups dominated by one or other of the brain hemispheres. This has been convincingly demonstrated in trials conducted by the Herrmann Institute (DeRidder and Wilcox 1999).

Systems Thinking

Senge (2006) proposes that systems thinking is the binding force that makes sense of the construction of a learning organization. Systems thinking provides the "big picture" foundation upon which the learning enterprise should be built. The approach of systems thinking is fundamentally different from that of systems analysis, which focuses on studying individual constituents within the organization. Systems thinking, by contrast, focuses on how the phenomenon being studied interacts with the other constituents of the system of which it is a part. Therefore, instead of working downwards to progressively finer detail of the system being studied, systems thinking involves working upwards and expanding its view to take into account larger and larger numbers of interactions with other areas. This may result in sometimes strikingly different conclusions from those generated by traditional forms of analysis, especially when what is being studied is dynamically complex or has a great deal of feedback from other sources, internal or external (Aronson 1998). The key benefit of systems thinking is its ability to raise our thinking to the level at which we create the results we want as individuals and organizations, even in those difficult situations marked by complexity, great numbers of interactions, and the absence or ineffectiveness of immediately apparent solutions (Aronson 1998).

2.4.3 Understanding the Relevance of Learning

Some of the more recent writers in the area of organizational learning take a less evangelical and more practical approach. Jarvis (2007) argues that organizational learning exists as a concept only to benefit the organization, and warns that individuals may be less than enthused at the prospect of change being imposed upon them. Cross (2007) believes that in the right circumstances people will be motivated to learn, and makes three key observations from the individual, rather than the organizational, standpoint:

Recognising the relevance

People need to believe that there is sense in what they are learning. Today's knowledge workers are looking for walk-away value: they know that they will not be at an organization for ever (this applies particularly within the project situation). The challenge for the leadership is to fit the right people into their appropriate learning setting and trust that the motivation will follow.

Removing the fear factor

This encompasses several different elements. Firstly, the individual needs to be clear about what is expected of them. If the person has a background in a highly structured hierarchical organization, they may well find the open unstructured environment very challenging. The individual needs to feel secure in presenting what they do and do not know, and safe that he/she can make mistakes without reprisal. Everyone is expected to contribute to team dialogue, and to reflect on lessons learned. There should be regular feedback on progress, whether related to success or failure.

Understanding the need for everybody to learn

People need to be encouraged to seek out knowledge, and use whatever sources are available: colleagues, external contacts, the Internet. Team members should understand that knowledge should be shared and not hoarded, and mentoring and assistance is part of the strategy. Above all, there needs to be an awareness of the overall strategic picture, and why learning is an important part of the process.

2.4.4 Formal Learning versus Informal Learning

Cunningham et al. (2004) suggest that there is still an ongoing perception within many organizations that "learning" implies the provision of training courses. This, however,

is probably a flawed assumption, in that the majority of learning is work-based even though organizations may not recognise it, and are not specifically investing in that area. Raelin (2008) argues that organizations should recognise that the future lies with work-based learning, and make their workplaces ideal learning locations with learning centred around reflection on work practices. Elkeles and Phillips (2007) propose that the creation of an effective workplace learning environment contributes to the attraction and retention of talented and innovative people, which is the greatest source of competitive advantage.

Cross (2007) takes a more radical view, and estimates that 80% of all learning within organizations is informal, and only 20% is gleaned by formal means such as education and training programmes. He argues that many organizations fail to recognise this, and continue to fund training courses that are less than effective and do not deliver good value in favour of investing in informal learning initiatives.

2.5 Methods for Sharing Project Learning

The literature proposes that there are three main vehicles for sharing project learning with the wider organizational domain. These are the project review, the project management office or equivalent, and the creation of explicit knowledge. These areas are discussed in the following sections.

2.5.1 Post Project Reviews

There is wide acceptance that Post Project Reviews (PPRs) or Post Implementation Reviews (PIRs) can contribute greatly to sharing project learning, either within a portfolio of projects, or to subsequent undertakings (Anbari et al. 2008; Busby 1999; Williams 2004, 2008). In the absence of such reviews taking place, there is a serious tendency to "reinvent the wheel" rather than learn from the experiences of previous projects, as observed by Newell (2004: 12):

> *In the IT industry in particular, projects are the basic way of working...there is often a problem of capturing the learning from projects so that it is available for use by other projects. Instead each project tends to start from scratch, often making the same mistakes as others have made before.*

The PPR process involves convening a meeting of the participants at the conclusion of the project and reviewing the history, practices, and outcomes with a view to

understanding and capturing the lessons learned. The results are then stored within a searchable database and made available for reference by other practitioners involved in current or future projects within the same organization. They have great potential for disseminating an understanding of the practices that contributed to achieving project outcomes. The frequency and effectiveness of this practice within a range of IT projects will clearly form an important part of my research.

Research conducted by Busby (1999) proposed that reviews are fundamentally valuable learning mechanisms and can be effective in disseminating knowledge within the organization and correcting individuals' perceived knowledge. He observed that project participants did not automatically learn simply by being involved, and that knowledge was widely dispersed among the team members. He concluded that project reviews are a valuable vehicle for addressing the repeated errors that are a characteristic of organizational life. The importance of a process to capture, store and disseminate lessons learned from projects is also recognised by the project management methodologies PRINCE-2 and PMBOK (Project Management Body of Knowledge).

However, despite the widely perceived value of conducting reviews, there appear to be many reasons why they rarely realise their full potential as catalysts for learning. Researchers have discovered that reviews are frequently curtailed and sometimes omitted altogether (Anbari et al. 2008; Gwillim et al. 2005; Newell 2004; Norrie 2008). Among the reasons proposed for skipping or neglecting this valuable practice are: possible embarrassment to the contributors; a propensity to discuss technicalities rather than processes; a lack of discipline in enforcing the review procedure; and, most important of all, a failure to assign or create sufficient time. Keegan and Turner (2001) studied 18 organizations that regularly undertook projects (the majority were not IT projects) and found that all the companies had a policy of conducting post-project reviews. They discovered that, in every case, the reviews were generally considered less than satisfactory, mainly because of an insufficiency of time to perform the procedure properly. Williams (2007) conducted a survey of organizations in the UK, USA and China and received 522 responses to his questionnaire. Within the feedback it transpired that 87% of organizations surveyed believed that maintaining a database of lessons learned from project reviews was important, but only 22% had such a database in use. Again the primary reason for inaction was shortage of allocated time, with other reasons being lack of management support, and absence of clear guidelines. Gwillim et

al. (2005) surveyed *ex post* evaluations of IT projects in two major organizations and discovered significant socio-political disincentives to perform thorough evaluations, although both companies nominally subscribed to being active in conducting such reviews. Among the reasons provided for not executing comprehensive evaluations were: a tendency to view a project as a singular event rather than part of an evolution; the risk of initiating "negative" benefits such as staff reductions; and the possibility of embarrassment when mistakes and failures are uncovered.

Even when a good-quality review has been undertaken, there are found to be difficulties in propagating the learnings within the organization. There may be problems with the knowledge transfer process: locating the information, searching within it, and understanding the context and the relevance (Newell 2004). This leads to one of the fundamental tenets of knowledge management: the rationalisation of tacit versus explicit knowledge. Hansen et al. (1999) have recognised two strategies for sharing the different types of knowledge. *Codification*, where transcribed knowledge is stored within a database, is suitable for exchange of knowledge between subject matter experts where there are common points of reference. *Personalisation* is the more appropriate medium for sharing tacit knowledge where the parties do not hold a common understanding, and full meaning and connotation cannot effectively be transferred via the written word: it implies conversational exchanges and story-telling. Meanwhile Anbari et al. (2008) propose that the extent to which lessons will be learned from projects depends on two major factors: the prevailing organizational culture, and the project leader's decision-making authority, position and stature within the organization.

The ability of reviews to generate both tacit and explicit knowledge was also recognised by Koners and Goffin (2007), who noted in particular the propensity of review contributors frequently to use metaphors and stories to illustrate problems and experiences. However, in the codification of the reviews, very few of the metaphors and stories were recorded. Whilst the reviews may have been valuable in transferring tacit knowledge to other participants that were physically present, many of the nuances and subtleties in the narratives were lost in the transcripts. The explicit knowledge therefore lacked much of the immediacy and impact that was available within the tacit dimension. One author proposed a technique to address the issue of identifying and recording the difficult and non-intuitive lessons, and which he suggested might be a prime reason for project reviews failing to deliver value. Williams (2004) described the

use of a relational database tool that produced a visual representation of causalities, dependencies and feedback loops. This appears to have been used with some success, particularly where projects were complex and problems and solutions difficult to express in textual form.

Newell (2004) observed the variance between supply versus demand for project knowledge. Even where the mechanism exists to conduct effective reviews and capture the learning in a searchable form, there is a tendency for subsequent project practitioners to ignore the recorded material, as she noted:

> *Project team members only look for help when they have a need (a problem they cannot easily solve using their own knowledge and expertise), and then they will only go and seek solutions if they believe they are likely to find experiences that are relevant to their own context (Newell 2004: 17).*

The tendency of project practitioners frequently to believe that their venture is unique, and that records of previous experiences are irrelevant, is a "misguided belief" and an inhibitor of learning, according to Williams (2008: 249).

Coles (2004) recommended a straightforward method to address the issue of "shortage of time" being the prime reason for project reviews failing to be conducted. In her career at General Motors in the USA, she realised that the key to effective project reviews is simplicity and timeliness. The technique was borrowed from the US Army and was refined down to five simple questions:

- What was the intent?
- What actually happened?
- What can we learn from this?
- What action is required?
- Whom do we need to tell?

The practice was introduced at GM not as a mandate, but in the spirit of providing people with one more tool to use. It was deliberately kept simple so that it could be implemented easily and with minimum administrative overhead, and is claimed by Coles to have encouraged the frequency and effectiveness of project reviews.

2.5.2 The Role of the Project Management Office

There is an increasing body of literature that argues that the Project Management Office or Programme Management Office (PMO) is the potential catalyst in the quest for improved project learning within an organization (Julian 2008; Liu and Yetton 2007; Norrie 2008). The driver for the establishment of PMOs within organizations is to provide support to the project function with the intention of improving performance. The precise role and structure of the PMO varies according to the requirements and culture of the organization in which it is embedded (Julian 2008). The primary role of the office is to function as a provider of project standards, a repository of project knowledge, and the means by which lessons learned can be made available to subsequent project teams (Kerzner 2004). Alternatively, Liu and Yetton (2007: 790) define the PMO as "a formal layer of control between top management and project management" and concur that its principal function is "to coordinate learning across projects". The most common activity associated with capturing learning from projects is the Post Project Review, and therefore the facilitation of such reviews is one of the most important functions of the PMO (Julian 2008).

Norrie (2008) maintains that the successful PMO must effectively deliver the following essential functions:

- It must be perceived by all stakeholders as an ally and not a roadblock
- It must provide the most appropriate project tools and practices
- It must ensure that it keeps itself up to date and aims for continuous improvement
- It must be able to provide coaching and mentoring

Anbari et al. (2008) identify two distinct approaches to the implementation of a PMO. The flow of learning into the organization may be top-down, where the PMO actively manages and controls projects and has the means and the authority to propagate the knowledge. Alternatively, the flow may be bottom-up, where there is a Project Support Office that provides backup support and information to ongoing project teams and the office does not take an active role in directing activities.

Whilst the theory of the Project Management Office is compelling, both as a propagator of knowledge and as a major contributor to the concept of the learning organization, the

literature indicates that there may be impediments to its effective operation. Norrie (2008) warns that the PMO must be certain of its place in the organization, and there should be clarity around its charter and its source of authority. It should be properly resourced and funded if it is to achieve its objectives. However if there is a lack of clarity around the role, the PMO can "make matters worse by adding another layer of confusion and obfuscation to already confused project management efforts" (Norrie 2008: 75).

In a survey of 20 PMO leaders reported by Julian (2008), 55% of respondents reported that they did not believe they had sufficient authority over project teams to perform their role effectively. Additionally, 45% considered that shortage of time severely limited the value of the review process that is such an essential input to the PMO knowledge bank. Furthermore, there was a tendency to review only the failed or troubled projects, with the result that valuable learnings from successful endeavours were consistently overlooked. The reviews of the challenged projects were inclined to be perceived as punitive exercises and the contributors adopted defensive positions that further limited the derived value.

The PMO may be perceived by its stakeholders not merely as a consumer of valuable time or a source of embarrassment, but even as a tangible threat to established practices. This theme was demonstrated by Dovey and Fenech (2006) in their account of a failed attempt to initiate learning, knowledge creation, and structural transformation by means of the implementation of a strategic project office. The intention of the PMO was to deliver a rational project selection process and a consistency of practice, with the intention of prioritising projects and improving performance and throughput. However, the PMO was undermined by management cells that feared intrusion into their power base, and was disbanded after only six months of operation.

2.5.3 Management of Codified Knowledge

The importance of knowledge management is now recognised to the extent that it is covered by an Australian standard:

> *The transition into the knowledge era means that knowledge has become the major asset and capability for contemporary organizations...The knowledge-based services sector is now a key driver of national wealth There is growing recognition that knowledge and the ability of an*

organization to learn, innovate and adapt contributes significantly towards organizational strength and survival (AS5037-2005: vii)

Knowledge is considered such an important resource that (Fong 2003) considers it to have taken its place as one of the factors of production. Projects are significant generators of new knowledge, and in some organizations perhaps the only such generators.

However, Cross (2007) considers the management of knowledge by means of documenting and filing in a repository to be ineffective; he holds the belief that really valuable knowledge resides internally and cannot be codified. This is reinforced by Senge et al. (1999) who state that it is impossible to effectively convert tacit knowledge to explicit form. To emphasize this, it is believed that knowledge workers are five times more likely to ask a co-worker for information than they are to go to a database or repository.

Notwithstanding this, there is much useful organizational knowledge that can be codified and made available to staff members. It has been estimated that knowledge workers spend (and frequently waste) one third of their time searching for information. Frequently they will spend time recreating information that already exists, but that they are unable to locate (Cross 2007: 25). Helping people locate information is essential. People derive information from different sources, for example:

- Internal personal contacts (colleagues)
- External personal contacts
- Documentation (formal, informal, organized, loose)
- The Internet

There is a belief that the more that the workplace environment can assist team members to find the information they need, the more efficiently they are going to perform. Cross (2007) recommends performing information network analysis to find the bottlenecks and the poor connections within the organization. He quotes the example of IBM Corporation that employs over 300,000 people worldwide, and the creation of a "Blue Pages" online directory that lists all employees' work history, specialist skills and knowledge, together with client and competitor organizations with which they are familiar. Any IBM member of staff can search the directory to locate and contact a colleague with the knowledge they are seeking. Such information is relatively

straightforward to codify and maintain, yet the potential efficacy to the organization is very significant.

2.6 The One.Tel Experience

This organization is of particular interest to my research for two reasons: firstly, it represented a genuine attempt to build a learning organization from the ground up, and secondly, I worked there as a consultant for the last two years of its existence. One.Tel Limited was a second-tier global telecommunications company with headquarters in Australia. It had a brief lifespan from 1994 until it became insolvent in 2001.

The founder of the One.Tel company, Jodee Rich, had presided over an embarrassing corporate failure in the past and was very receptive to enlightened and imaginative ways to operate his new business. After his enforced departure from his previous venture in 1990, Rich became a student again, and (among other endeavours) attended the Wharton Business School at the University of Pennsylvania (Barry 2002; Davies 2001). It appears that during this period Rich formulated his rather novel ideas about business management. The One.Tel business model undoubtedly owed much to the concept of the learning organization. From the outset Rich declared that the new company would have a flat management structure with no hierarchies (Barry 2002: 64). However, Rich's ideas went much further than that:

> *The collected wisdom of Jodee's philosophy was...a mixture of Deepak Chopra, 'est' and New Age management theory, which was all about caring, sharing, positive thinking and peer review. There were to be no hierarchies, no job titles, nor even job descriptions. There would only be missions... (Barry 2002: 76)*

When One.Tel was functioning "normally", that is prior to the middle of the year 2000, the flat structure and the sharing and cooperation between teams appeared to serve the young company well. The business grew fast and major IT projects were conceived and implemented in very short time (Avison et al. 2003). The chaotic nature of the business threw up champions again and again who would achieve great outcomes with their heroic efforts.

Rich used physical techniques to help build the learning capability. All the office spaces were completely open plan, all staffers sat at shared benches and not desks; everyone was grouped into small teams that sat together. Some words were banned as

being too bureaucratic and old-world – *meeting*, *manager*, and *department*. Informality and openness was the keynote of their entire business model. There were anti-bureaucratic and pro-learning slogans painted on the walls. For example there were exhortations to "cut meeting times", and "share knowledge". Many of Rich's ideas appeared to have been culled from the textbook, without any real thought as to whether they were appropriate as the business grew.

It became apparent that the effectiveness of the informal business model started to decline when the organization grew (Avison et al. 2003). Rich's model simply did not scale upwards, and importantly he did not seem aware that not only was the organization no longer learning, it was also becoming progressively more dysfunctional (Barry 2002). Rich became increasingly distracted by global growth, and making deals with international peers. At this point his lieutenants, who were much more closely involved in the operation of the business, should have stepped into the breach and ensured that the culture of cooperation and motivation was maintained. However these key executives either did not recognise what was happening, or were paralysed into a state of inactivity. The awkward truth appeared to be that the lieutenants seemed to be fearful to take action without Rich's input or approval. As observed by Avison and Wilson (2004: 209) "although the IT manager reported to Rich himself, the lack of management structure implied a lack of status and power".

The principal failures seemed to be the inability of Rich to effectively delegate and entrust his vision to his key executives. Secondly the informality that functioned so well initially was inappropriate when the company had grown to be a major international operation, listed on the Australian Stock Exchange with a market capitalisation of $5.3 billion in 1999 (Barry 2002). In areas such as financial control, there is no substitute for accuracy and accountability, and no excuse for not implementing these controls properly. Avison and Wilson (2004: 209) declared that: "in terms of control systems, there were no structures, no accounting systems, no processes, and no controls".

The collapse of One.Tel in 2001 was not a failure of the principle of the learning organization, but a failure of execution. One.Tel became a highly-stressed company in its final stages. There was simply no time and no budget to address the cracks and malfunctions that were appearing all over the business. The informality that seemed to enable the growth so well in the early years ironically became the instrument of its own

destruction. The moral is, in a high-growth and dynamic situation, to ensure that the structure and culture of the organization are reviewed and adapted constantly to ensure that they can support its changing and growing needs.

Within my research I have included a project that was undertaken at One.Tel that spanned the period from "normal" operations to the beginning of the terminal decline that commenced in mid-2000. It is intended that the examination of the execution of this unfinished project will illustrate some of the risks involved in the implementation of a learning regime without recognising the responsibility to update and adapt the model.

2.7 Conclusion

Within this chapter I have reviewed the literature that I believe is relevant to the phenomenon of project learning. At the level of personal learning, there is a wealth of material and theories, and I have included those that seem pertinent to my research. Individual learning is believed to be largely a function of the transformation of experience, and the project situation is rich in experiential opportunity. Experiences may be transformed in different ways depending on an individual's particular frames of reference, interpretation of contextual relevance, motivation and absorptive capacity. Importantly, learning may be related to the preparedness to experiment or engage in double-loop learning, in other words, to accept risk.

The concept of organizational learning is thoroughly articulated by many writers and theorists, much of it based upon the early and seminal work of Argyris. I have selected a range of literature that examines the ways in which organizations can facilitate learning. I have also reviewed published material regarding the means by which project experiences can be socialised within the organization. My interest in this respect is in understanding how project knowledge can be accumulated and exploited, in order that organizations can deliver projects more efficiently and consistently.

The concept of team learning is less well articulated, but there is interesting material in the domains of team dynamics, situated learning, experimentation and risk-taking. Much of this literature relates to permanent teams operating within organizations with particular functional mandates. The material that specifically addresses learning within projects, that is teams with a short lifespan, is certainly not abundant. If we further refine the search to *Australian information technology* projects we find the terrain

barely populated at all. For this reason I believe that my research topic is relevant and well-justified. The next chapter discusses the basis for the selection of my research methodology.

CHAPTER 3: SELECTION OF THE RESEARCH METHODOLOGY

3.1 Assumptions

The intention of the research is to discover the nature and extent of the phenomenon of learning that prevails within Australian information technology projects. There is a series of metatheoretical assumptions to be made regarding the nature of the reality of the research setting, and the nature of the knowledge I am seeking to access. In the first instance, it is necessary to examine the subjective / objective dimension:

The Subjective / Objective Dimension				
Subjectivist approach				**Objectivist approach**
Nominalism	←	Ontology	→	Realism
Interpretivism	←	Epistemology	→	Positivism
Voluntarism	←	Human Agency	→	Determinism
Ideographic	←	Methodology	→	Nomothetic

Figure 3.1: The Subjective / Objective Dimension

Adapted from Burrell and Morgan (1979: 3)

There are two broadly different approaches to the research challenge, and the assumptions made will lead to the adoption of the more appropriate course of action.

3.1.1 Ontological Assumptions

It is necessary to make ontological assumptions about the research setting, that is, the IT project itself, and the learning experiences of the individuals who participate in it. The research question here is whether the setting is assumed to be subject to the principle of nominalism or the principle of realism. Nominalism maintains that social reality does not exist independently of human cognition, and that in order to structure our action we use names, concepts and labels to negotiate the social constructs that we create. Realism asserts that social reality exists independently of human volition, and is made

up of 'hard', tangible and relatively immutable structures (Burrell and Morgan 1979). The IT project has a certain physical presence consisting of some individuals, some occupied space, and some equipment. These tangible things only constitute a "project" when they are bound together by a common purpose. The project is a form of organization, but it lacks many of the attributes of that which we generally perceive as an organization. It has no corporate entity, no presence in law, probably not even an externally listed telephone number. It does have a title, some staff members, some tools of trade, and frequently its own budget. It operates under a charter, frequently informal, that binds these assets together temporarily. It exists only as a transitory sub-organization of the larger one that it was established to serve.

There are certain attributes of a project that are tangible and measurable, that enable one project to be compared superficially with another. The number of staff involved, the duration, and the size of the budget allocation, are all quantifiable. My research is not concerned with comparing measurable project statistics, but to gain insight into, and to construct knowledge from, project experiences.

The ontological assumption that underpins this research is that an IT 'project' is a nominal entity: one that is subjectively constructed and sustained in the minds of its stakeholders through inter-subjective phenomena such as language. Without recognition by the human community the concept of "project" cannot exist. Those participants involved in a project are exposed to, and participate in, a series of activities and events that build knowledge and skill. As a researcher I am unable to stand back and "see" a project, nor the learning that takes place within it. I can only reference these phenomena through words and labels. As such, this research assumes a nominalist ontology.

3.1.2 Epistemological Assumptions

In order to uncover the knowledge that I am seeking, it is necessary to make an epistemological assumption: that is, about the nature of the knowledge itself. I need to decide whether the knowledge exists in objective form and can be measured by appropriate technology and human senses, or whether the knowledge is a subjective notion that exists in the minds of people who have experienced the phenomenon of working within an Australian information technology project.

In the project environment, the knowledge that I seek relates to experiences, and not metrics associated with project techniques and tangible success factors. I am not seeking the answer to "*can you describe how your project was organized?*" but "*what was the experience like, and what did you learn?*" I believe that the knowledge for which I am searching is tacit in the sense that it exists only in the mind of the participant, and not readily codified. Much of the learning associated with being part of the project phenomenon is experiential and an example of 'education that occurs as a direct participation in the events of life' (Houle 1980: 221).

The epistemological issue under consideration is whether the phenomenon of 'learning within an IT project' is real and readily measurable in quantitative terms (as assumed within the positivist paradigm), or whether it is subjective in nature and relies for its manifestation on human interpretation (as assumed within the interpretivist paradigm). In order for the positivist approach to be valid, it would be necessary to demonstrate that the phenomenon of learning can be verified by the scientific method; is subject to the laws governing causal relationships; and that regularities between its constituent elements can be ascertained and predicted (Burrell and Morgan 1979). Alternatively, the interpretivist approach contends that the researcher constructs knowledge through interpretation based on his or her own lifeworld, reflecting cultural norms, experience, and history (Weber 2004: vi). It is evident that the rich experiential knowledge that I am seeking is not objective in nature and cannot be accurately quantified nor statistically verified. Instead, it exists in the minds of those who have experienced the phenomenon, and depends for its manifestation upon the researcher's empathic interpretation and linguistic skills in articulating the subtle nuances of meaning embedded in the interview process. As such, the research assumes a subjectivist epistemology.

3.1.3 Human Agency Assumptions

There is a decision to be made about my perception of the human condition. The theory of voluntarism contends that human beings have agency and create social reality through their cognitive constructions. That is, by means of their volition, and their ability to control, make decisions and choices, they construct the nature of social reality. Alternatively, one can take the determinist viewpoint, that human beings are products of

their environment, and that their nature is completely determined by the objective structures of natural reality (Burrell and Morgan 1979).

I have previously made the ontological assumption that the IT project is an entirely subjective construct that has a nominal existence in order to facilitate human interaction with respect to specific human life interests. It has been created out of human volition, by means of a series of decisions and choices and is referenced by concepts, labels and other linguistic phenomena. Thus I subscribe to voluntarist assumptions regarding human agency.

3.1.4 Methodological Assumptions

There are two broadly different ranges of research methodology, depending on whether the selected approach is to be subjective or objective. The ideographic approach suggests that knowledge about social reality is of a qualitative nature and is accessed through inter-subjective encounters with other human beings. The nomothetic approach contends that all knowledge is quantifiable and should be accessed through proven scientific techniques and systematic protocols (Burrell and Morgan 1979).

I believe that the knowledge that I seek is qualitative and can be accessed only by means of inter-subjective encounter with those persons who have experienced the phenomenon under research, that is, learning within the Australian IT project environment. My research methodology will therefore be based upon an ideographic approach.

Within the subjectivist methodological perspective, the question of the research intention with respect to the research context is important to clarify. If the intention is to attempt to transform the social reality under research, then a constructionist epistemology, critical theory perspective, and an action research methodology would be appropriate. However, if the intention is purely to understand the social reality under research, then a subjectivist epistemology and an interpretivist theoretical perspective is appropriate, with a choice of methodology between phenomenology, ethnography and grounded theory.

3.2 Research Methodology Options

The challenge for me has been to determine the appropriate methodology that will enable the encapsulation of the essence of the project learning experience. Given the ontological and epistemological assumptions underpinning my research, an appropriate

methodology would be located within the interpretivist paradigm. The following table summarises the range of approaches for accessing this form of knowledge:

Summary of Research Approaches				
Knowledge type	Dimension	Applicable theory	Methodologies	Research Methods
Qualitative	**Subjective**	**Interpretive**	**Ethnography** **Grounded Theory** **Phenomenology**	**Participative observation** **Case studies** **Focus groups** **Conversational analysis** **Interviews**

Figure 3.2: Summary of Research Approaches

Since it has been established that the knowledge sought through this research is qualitative/subjective in nature, the appropriate methodologies are therefore: ethnography, grounded theory, or phenomenology. This implies that the knowledge can only be accessed through inter-subjective means; that is through:

- empathic observation (attempting to observe the phenomenon and thereby gaining insight into the perspective of those who are experiencing it)
- participation (gaining insight through personal experience of the phenomenon)
- empathic interpretation (understanding the phenomenon through creative imagination)
- deep human communication (in-depth interviews)

3.2.1 Ethnography

Ethnographic research is concerned with investigating and understanding societal behaviours by means of profound immersion in the research environment. The researcher endeavours to comprehend the social and behavioural norms and heuristics within the research setting by means of prolonged field study (Goulding 2005). As a researcher I would need to join a project team for a period of weeks or months and become intimately involved in its day-to-day operation. It would provide the opportunity to experience and record at first hand the patterns of knowledge creation and learning that evolve during the project life cycle. This might appear to be a suitable

methodology to adopt, however there are significant reasons why this approach was not selected.

In the first place, I wish to research a broad range of projects and experiences, and an ethnographic approach would necessarily limit my scope. Within my research timeframe I might only be able to research a handful of projects, albeit in great depth, when I am seeking patterns of meaning across the broad project spectrum. There may also be substantial practical issues around joining a project situation for a prolonged period, involving acceptance by, and possible distraction of, a committed and focused project team.

3.2.2 Grounded Theory

The concept of grounded theory is to enable the development of theories to represent the patterns that emerge from iterative qualitative field research (Gephart 1999). As research is conducted using observation and subjective contact, a theory is progressively developed about the nature of the phenomenon and its participants. Each new set of research findings is compared against the evolving theory and used to refine it. In undertaking grounded qualitative research the researcher often begins with an orienting concept that provides a general sense of reference. Data are collected in the form of records of multiple interactions and conversations about the phenomenon of interest (Gephart 1999), and constant comparative analysis is utilised to identify patterns of meaning represented in the data.

Grounded theory appears to offer possibilities for my research discipline, but it presents some important limitations within my circumstances. Firstly, I have no preconceptions about the nature of learning that I can use to orient or guide the investigation. Secondly I am not seeking a theory of learning from my research, but a deep understanding of the phenomenon of learning within projects and the associated work practices that sustain it.

3.2.3 Phenomenology

Phenomenology is the study of conscious phenomena as experienced from the first-person point of view, that is, the meanings things and experiences have in our "lifeworld". The principles of the discipline were first defined in 1901 by the philosopher Edmund Husserl (1859-1938) in his work entitled "Logische Untersuchungen" (Logical Investigations). The term "lifeworld" is a direct, albeit

rather clumsy, translation of the German *Lebenswelt* as used by Husserl to designate the subjective world that we inhabit and the meanings and interpretations that we assign to our individual and social experiences.

The concept of phenomenology is defined by Elveton (2005) as:

> *...a way of emphasizing the centrality of perception for human experience. This experience is multi-dimensional and includes the experience of individual things and their contextual/perceptual fields, the embodied nature of perceiving consciousness, and the intersubjective nature of the world as it is perceived, especially our knowledge of other subjects, their actions and shared cultural structures.*

We all reside in a day-to-day world surrounded by objects, persons, and events that comprise a complex whole. We ascribe meanings to those things around us according to our cultural background, previous experience, even our current mood or emotional state. The phenomenological research process seeks to make explicit the implicit structure and meaning of the experiences of those individuals comprising the research cohort (Sanders 1982).

Language is the central medium for transmitting meaning and the phenomenological researcher has only one legitimate source of data: the views and experiences of the participants themselves (Goulding 2005). The research is conducted with carefully selected subjects who have lived the phenomenon at first hand. Through in-depth interviews, using probing, open-ended questioning, the knowledge that is sought is accessed and made explicit.

The phenomenological researcher must attempt to suspend temporarily all personal presuppositions and preconceptions about the participant and the matter being researched, as far as this is humanly possible, in order to limit any contamination of the knowledge accessed in this way (Ardley 2005; Sanders 1982).

3.3 Choice of Research Methodology

The goal of qualitative research is to make sense of experience, by means of the transformation of tacit knowledge into abstract explicit knowledge, with a view to gaining a deeper understanding of the subject.

Having made my key assumptions about the context, and considering the research options, I have decided that the research will utilise a phenomenological methodology.

The epistemological assumptions that sustain this approach are that the requisite knowledge exists in tacit form in the minds of those who have experienced the phenomenon under research, that is, learning in projects. The analysis and synthesis of the knowledge gained in this way from the set of carefully selected participants (people who have experienced the phenomenon and who, with appropriate empathic questioning, are able to articulate their interpretation and sense-making of that experience), will enable me to develop a rich understanding of the phenomenon of learning in the project environment, and the work practices that are associated with, and support, the phenomenon. Of particular importance in my case will be the suspension of all preconceptions about both the matter under research and the individual, because of my own experience in the field and the possibility of being acquainted with the participant.

The following diagram illustrates and summarises my assumptions and thought processes in arriving at the choice of research methodology:

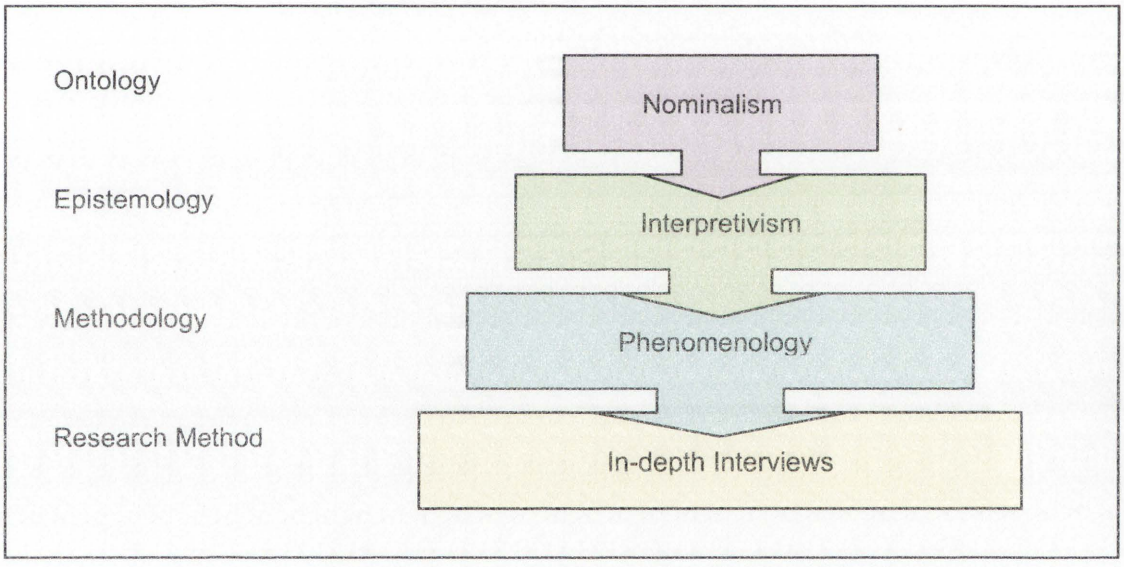


Figure 3.3: Research Methodology Selection

The knowledge significance of this research lies in its attempt to facilitate a deep understanding of the culture of learning as it exists within Australian information technology projects. In the belief that the phenomenological approach will deliver the richness of understanding that is sought, I then commenced the selection of suitable research candidates.

CHAPTER 4: SELECTION OF RESEARCH SUBJECTS

4.1 Introduction

The research process involved initially choosing suitably qualified interview subjects using a set of pre-determined selection criteria. These criteria have been rigorously applied and wherever there has been any doubt about a potential subject's suitability, he or she has been excluded. The failure to meet the suitability test almost invariably involved the lack of appropriateness of the project, and rarely the individual. A number of subjects that I expected to be strong candidates for the research process actually declined to be interviewed when they discovered the nature and purpose of the interview. This may have indicated a reluctance to discuss their personal challenges in a project situation, and is perhaps suggestive of the difficulty that the researcher faces in uncovering the mistakes and trials that appear to occur so frequently. This disinclination to be interviewed is considered again in the discussion of project outcomes.

4.2 Research Participants

My objective in this research has been to access the learning experiences of many different project participants across a wide and representative range of Australian projects. The Information Technology project is not an entity that can be tightly defined or profiled because it covers such a wide range of technology-related activities. In general it consists of a team of people that join together for a finite period of time for the purpose of delivering a technological outcome to a sponsoring organization. The typical composition comprises three main roles: leadership, business analysis, and technical specialists. There will frequently be representatives from that section of the business who will be users of the new technology, who may also be considered members of the team. Very often some of the constituent members will change during the course of the project, as the requirement for different skills becomes necessary. Some team members may participate on a part-time basis because their specialist knowledge or expertise may be required intermittently. In some cases there may be more business process emphasis; in others technology may be more prominent. The scale can vary significantly: from a single versatile individual up to many hundreds, with each shade of speciality represented by a whole team of people.

An important characteristic of the project context is to recognise that there is frequently more than one "organization" involved in the delivery. The organization which is the beneficiary of the project outcome I have termed the "sponsor": this entity initiates the project, usually provides at least the majority of the funding, and takes delivery of the end product. The other contributing organizations I have termed "vendors": these companies are hired by the sponsor to provide specialist services that contribute to the project delivery. These specialist services may include a wide range of activities from management of the entire operation, through to provision of application packages, supply of specialist business or technical expertise, and/or custom software development. It is certainly not uncommon to find that a vendor contributes partially to the sponsorship and funding of a project: this may occur when the vendor wishes to establish a market presence or to develop additional product functionality. In that case there is an element of co-sponsorship, but the primary role remains that of vendor. It has been important to recognise the distinction between the organizational viewpoints during the research process.

The participants in my research have a range of job titles. Titles such as project leader, project manager, team leader, business analyst, application consultant, system architect, program developer, and communications specialist are in frequent use. These names are loosely defined and the tasks and duties involved vary widely. However the designation usually gives some clue as to the nature of the role performed. In my selection of subjects, I have endeavoured to include a wide range of project responsibilities and viewpoints. I have also attempted to obtain a representative mix of genders and of tenure (that is, whether permanent staff or contractor). The analysis of the research subject categories is provided in the following sections. At all times I have ensured that their project met my selection criteria (refer Section 4.3), and that the subject was involved both for the majority of its duration, and was fully immersed in the project experience. My base research cohort comprised 24 interviewees, and their different project roles and situations are described in the following sections of this chapter.

One interview was conducted and included that did not exactly meet my criteria. This was an interview with a former One.Tel employee who had been engaged on the infamous billing system project (Avison et al. 2003). This project failed to meet my criteria on one single condition, in that it took place during 2000 and was therefore outside my time limit. However, this was an opportunity to gain a firsthand insight into

the learning experience within that project and that organization, and it is discussed in detail later in the thesis.

4.2.1 Research Subject Roles

The following table indicates the different roles that the research subjects undertook within their project situations. At the time of selecting the candidates I was unaware of any significance in the learning attributes that might emerge depending on the responsibilities of their particular position. My intention was to secure a representative range of functions, with a fairly even division between leadership roles and specialist roles. The outcome was the pattern shown in Table 4.1, with nine subjects involved exclusively in project leadership, an additional four subjects performed a leadership role combined with some specialist contribution, and eleven operated as specialists in their particular field of expertise.

Role	Responsibility	Number
Program Director	Leadership	3
Project Manager	Leadership	6
Combined Manager / Specialist	Leadership	4
Business Analyst	Specialist	5
Technical Specialist	Specialist	2
Test Leader	Specialist	1
Developer	Specialist	3
Total		**24**

Figure 4.1: Research Candidate Functional Roles

4.2.2 Organizational Viewpoint

The importance of the viewpoint held by the research participants had not been anticipated when I commenced my research process. However, it transpired that subjects representing vendors held different views around both project and organizational learning when compared to those interviewees representing the sponsoring organizations. I did not set out with the intention of obtaining a particular

mix of candidates from each side, and the outcome was as shown in Table 4.2. The division of 70:30 in favour of the sponsor was simply fortuitous and I believe it is sufficiently representative to provide credible input from both points of view.

Viewpoint	Number	%
Sponsor	17	70%
Vendor	7	30%
Total	**24**	**100%**

Figure 4.2: Sponsor Subjects vs. Vendor Subjects

4.2.3 Role Tenure

Another variation in the candidate profile was the distinction between whether they were permanent employees of their organization (either sponsor or vendor), or whether they were contracted for the duration of the project. In my experience, the Australian project scene is quite strongly populated by contractors, and this has been the case for two or three decades. The reasons are quite obvious: project work is limited in duration, and it tends to employ persons with specialist skills who are too expensive to retain on staff when their services are not required. This has led to the development of a mobile project workforce that migrates between assignments, with the result that most project teams have a number of contractors within their ranks. It is not clear whether this is the case in overseas IT marketplaces, however the literature around projects (much of which is sourced overseas) seems not to recognise the contribution of contract staff, or at least does not assign it much importance. I hold the view that this local inclination is significant to my research and I endeavoured to obtain a good representation of both tenures. Figure 4.3 below indicates the division:

Tenure	Number	%
Permanent	13	54%
Contractor	11	46%
Total	**24**	**100%**

Figure 4.3: Permanents vs. Contractors

4.2.4 The Gender Divide

There is also a potentially interesting divide between male and female participants. I found it quite difficult to source female subjects; this was not because of any reluctance on their part, but because they appear to be less numerous than males in the IT project setting. In my experience, females have always been generally well represented in information technology, and frequently at high level, but they seemed to feature less strongly in the project profiles upon which I have focused. Table 4.4 indicates the gender divide:

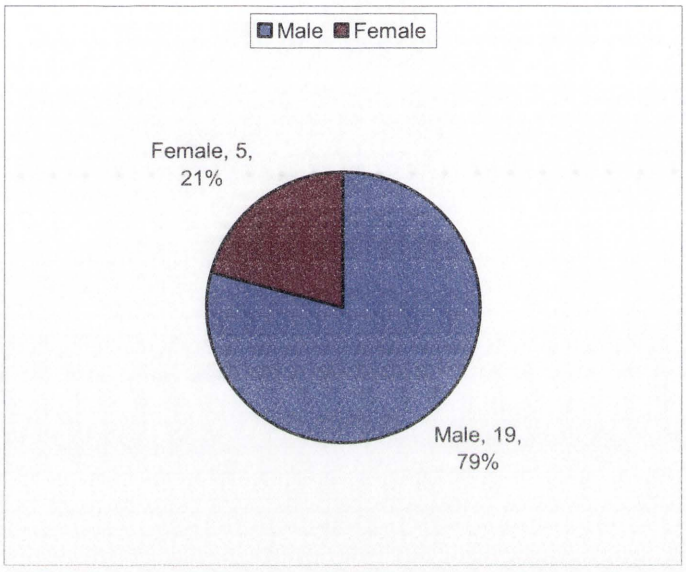


Figure 4.4: Males vs. Females

4.2.5 Sources of Participants

The contributors to my research were sourced by various means. I have worked as a freelance contractor in the IT industry for over 20 years, and I have acquired a significant network of contacts that I was able to approach to start the interview process. This led in turn to many referrals to other participants. I was also able to acquire a number of contributors through the Information Technology Management Programme (ITMP) at UTS. My contact register contains over 60 names whom I approached and with whom I discussed the research requirement. In more than half the cases it became apparent that the subject had not worked on a project that fitted the profile: it was not sufficiently recent, it was too small, or the participant's involvement was less than substantially full-time. In a small number of instances, the subject had the right project credentials and declined. Figure 4.5 below indicates the sources of the contributors:

Contributor	Number
Current work colleagues	1
Former work colleagues	7
Professional acquaintances	3
Referred by colleague	8
UTS contacts	5
Total	**24**

Figure 4.5: Sourcing the Contributors

4.3 Project Selection Criteria

The choice of subjects has been limited to those who have been involved in substantial information technology projects within Australia that have reached a conclusion within the five years preceding the date of the research assignment. The rationale that supports these selection criteria is justified as follows:

Information Technology projects: this criterion is fundamental to the research, and I have applied it relatively simply. Provided that the project involved the development, upgrade or implementation of hardware, software, or the dependent business processes, I considered it for inclusion. In most cases, projects can be readily identified either as sitting squarely within IT, or clearly outside it.

Within Australia: implies that the project is managed onshore, and is for the benefit of an onshore organization, even though there may be an offshore contribution (as is increasingly the case).

Substantial projects: the interpretation of a project as being 'substantial' depends on individual factors and is relative to the size of the organization. I have set somewhat arbitrary parameters around the concept of minimum project size, and I have defined it as:

- Minimum six full-time team members (or equivalent part-time contributors, for example two half-timers is equal to one full-timer)
- Minimum duration six months

The objective has been to exclude those projects that are small scale and/or low budget. This is not to imply a suggestion that such projects are unworthy of inclusion, but more a perception that their smaller scale may limit the team learning attributes that are a very important aspect of the whole project learning phenomenon upon which I have focused.

Five-year limit: the five year time limit is for the purpose of ensuring that the project took place, or was at least completed, post the great IT recession of 2001 – 2003. The information technology industry in Australia underwent significant structural change during these years, becoming much leaner and far more accountable. The Year 2000 surge of IT activity was followed by an unprecedented downturn, and I believe there is some evidence that project dynamics in the pre-Y2K period were markedly different from those that we have observed in more recent years.

4.3.1 Projects by Industry Group

The projects involved in the research covered a broad spectrum of Australian organizations. This was a result of casting the net wide, and I believe it has produced a credible cross-section of organizational activity, as shown in the following table:

Industry	Number
Financial	5
Transport	5
Government	4
Health	2
Manufacturing	2
Telco	2
Retail	1
Media	1
Marketing	1
Recruitment	1
Total	**24**

Figure 4.6: Projects by Industry Group

4.3.2 Project Type

The projects researched covered a broad range of types, including (inter alia) replacement of infrastructure, application development, and enablement of offshore business processing. Turner (1999) identifies four basic project types, depending on the interrelation of how clearly the project goals have been articulated, measured against how well the project methods have been defined. The chart below illustrates the theory:

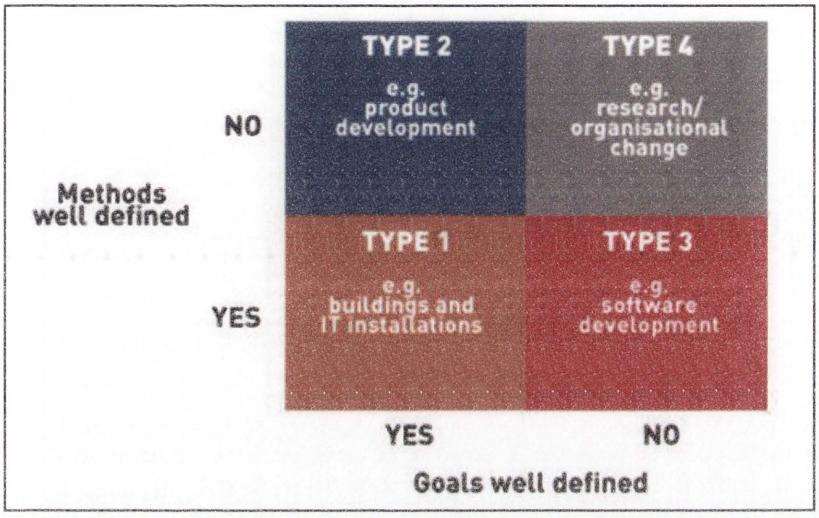


Figure 4.7: The Project Goals and Methods Matrix

(Turner 1999: 26)

Using this matrix, projects type 1 should have the greatest likelihood of success because the goals can be clearly defined and the work methods are well known and regularly practiced. Within the body of my research, projects such as those to replace or update IT infrastructure would fall into the type 1 quadrant. Those projects involving application software development, where work methods should be well defined but goals may be more difficult to determine, would be classified as type 3 with a correspondingly higher risk association. Projects type 4 represent those with the greatest risk of failure, because at least some of the methods required are unknown, and the goals are not clearly established. I have not positively identified any projects type 2 within my research, where the goal has been clearly specified, but there are no supporting practices to achieve it.

Within the following table I have classified my researched projects into broad groupings and assigned each one into its logical quadrant. This provides a guide to the range of material within my research, but it is far from the complete picture. For example, I have

described two projects as "system migration", which is a broadly accurate representation, but the two endeavours were distinctly different in scale, politics and objectives. Within Appendix 2 I have provided a brief description of each project which illustrates with more clarity the wide range of activities within the research.

Project Classification	Primary quadrant	Number
Custom application development	Q3	9
Package customise and implement	Q3	7
Infrastructure	Q1	4
System migration	Q3	2
Information security	Q4	1
Business process offshoring	Q4	1
Total		**24**

Figure 4.8: Researched Project Types

There is a major limitation in attempting to assign each project to a particular quadrant type, because many cannot be categorised so readily. For example, several of the development and customisation projects, classified as Q3, also involved a major infrastructure upgrade, so logically they should also include a significant Q1 component. Likewise, many of the projects encompassed a substantial organizational change which brings them at least partially into the Q4 domain. Within Appendix 2 I have indicated both primary and secondary quadrant assignments for each project to provide a greater insight into the areas of overlap.

4.3.3 Project Size and Scale

For the purposes of analysis and comparison I have divided the projects into three size groupings. The groupings combine both the factors of project headcount and duration. It was necessary to my research to understand the comparative size of each project, and commonly used metrics such as function points and total cost were not readily available to me. However, each of my respondents was able to provide a credible guide to the

number of people employed and the project timescale. I have calculated a number of work units per project, which is the headcount factored by the months of duration. This provides an estimate of project size, influenced as it is by each subject's recollection of numbers involved and extent of time. However, I believe that it is sufficiently realistic to enable me to classify the projects into broad size groups, as shown in Figure 4.9.

Size	Units	Number	%
Large	601-upwards	9	38%
Medium	201-600	8	33%
Small	50-200	7	29%
Total		**24**	**100%**

Figure 4.9: Project Size Groupings

Within Appendix 3 I have provided a more detailed summary of each project, including details of duration in terms of months, number of personnel involved, and the calculated number of work units. I have also indicated the composition of the project, which is a guide to the number of parties involved, i.e.

Simple, where there is only a single (sponsoring) organization concerned. Six such projects were identified in the research.

Client/vendor, where there is a single vendor supplying software and/or services to the sponsoring organization, and a combined or separate project team. Ten of the projects were classified in this way.

Complex or Multi-vendor, where there are multiple vendors involved in delivering the project and a correspondingly complex team structure. Eight of the projects were considered to be complex.

4.4 Ethical Considerations

A formal submission was made to the UTS Human Research Ethics Committee (HREC) in April 2008. In this, I presented a description of the research that I proposed to conduct, and the methods I intended to utilise in selecting the participants. The committee responded in May 2008 and requested clarification of a number of issues.

The issues raised, and my responses, are provided here:

The possibility of disclosing commercially sensitive information, or material critical of the organization:

> Participants are not required to provide names of sponsor or vendor organizations. If the names become apparent in the course of the interview, they are not included in the text of the thesis and it is my intention that organizations should not be identifiable within the context that they are mentioned. The only organization mentioned specifically by name within the body of the text is One.Tel Limited, which is no longer a trading corporate entity. If there is no possibility of an organization (or an individual) being identifiable within the thesis, then the risk of disclosing commercially sensitive information, or material critical of any organization, is negligible.

Whether the subjects will be expected to participate in the interviews during paid work time:

> This was not the case; subjects were requested to participate in their own free time, at a convenient venue of their choosing.

Whether subjects are expected to respond on behalf of their organization or themselves:

> Subjects are asked to respond on their own behalf. The research is concerned primarily with personal experiences rather than critique of organizational practices.

Justification should be provided for asking identifying questions in the initial questionnaire:

> The purpose of the questionnaire is to provide focus on the project under research. The identifying details that emerge are to enable the project to be classified and positioned within the research context.

A written response was provided to HREC, addressing all their issues. A formal approval to proceed with the research was received on 5 June 2008.

4.5 Conclusion

The individuals and their projects that I have described in this section constituted my research cohort. The respondents were interviewed over an 18 month period and

provided a remarkably rich and varied source of material. As I have explained, the subjects comprised a mix of leaders and specialists, sponsors and vendors, permanents and contractors, males and females. The projects took place within a broad range of industries, representing both private and public sectors, and with wide variations in objective and scale. The next chapter describes the selection of the methodology that enabled me to gather the research data.

CHAPTER 5: RESEARCH DATA ACQUISITION

5.1 The Data Collection Process

The method of accessing the research data that I required has been by means of in-depth phenomenological interview. Having identified suitably qualified contributors as described in the previous chapter, I requested that they provide me with a written summary of the project profile and setting (refer to figure 5.2), and arranged a place and time for the interview. The interview took place in a controlled and methodical manner, and was recorded using two separate recording devices. Afterwards the interview recording was played back and transcribed by me into an electronic document. The interview transcript then became the baseline source data for my interpretation and analysis. The data collection process is described in detail in the following sections, and illustrated below:

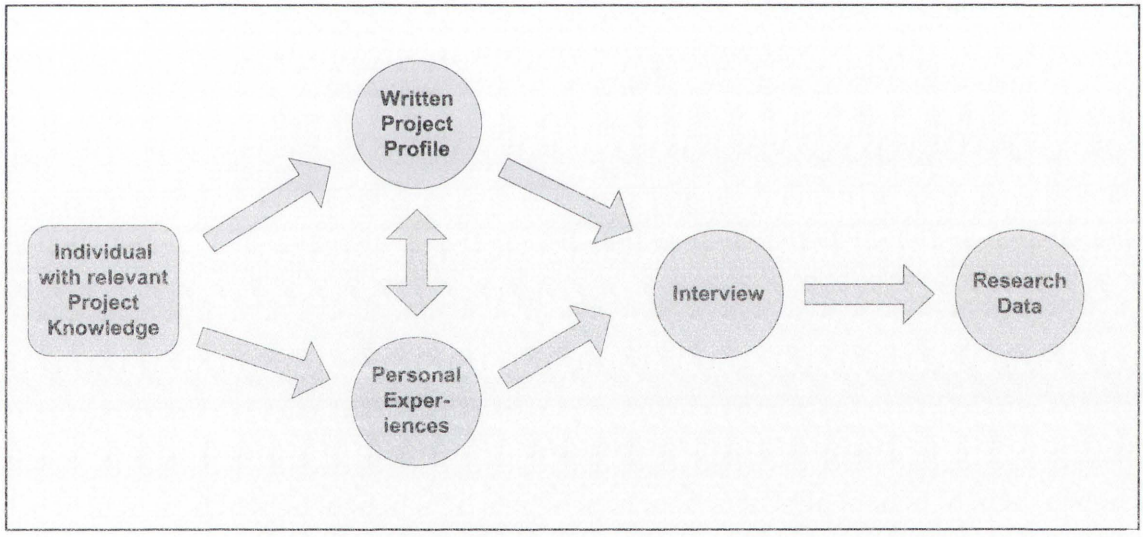


Figure 5.1: Schematic of the Data Sourcing Process

5.1.1 The Data Acquisition Timetable

All data gathering was completed within an eighteen month period from the middle of 2008 to late in 2009. This fairly condensed time frame was mandated to preserve the integrity of the information acquisition cycle as well as its relevancy to contemporary practice within the information technology industry, an industry well known for its rapid and dynamic evolution.

5.1.2 Project Profiling

Before commencing the research process, the contributor had already been carefully screened, and I was already certain that the project to be scrutinised met my criteria. At the time of setting the interview time and location, I provided the subject with a brief project profiling questionnaire (see figure 5.2) by e-mail, and requested that he/she complete it prior to the interview. In some cases this summary was e-mailed back to me prior to the interview, in other cases it was completed at the start of the interview. In either event, it provided the necessary background and focus that I required before the interview commenced: it also enabled me subsequently to position the subject and the project into the various groupings that I have established and described previously. Before the recorded interview commenced there was general conversation about the information in the questionnaire. The intention of this initial discussion was to engage the respondent and guide the terrain of the narrative (Ardley 2005).

Project profiling information		
1	The year the project started	
2	The duration of the project	
3	The period of time that you were involved	
4	Your role in the project	
5	The industry type (e.g. financial, manufacturing, state government etc)	
6	Short description of the project	
7	Number of organizations involved	Sponsor
		Vendor
8	The approximate number of people involved in the project (divided into "project" and "business or customer")	Project
		Business
9	Approximate project budget	
10	Size rating relative to the organization	
11	Political importance within the organization	

Figure 5.2: Initial Project Profiling Questionnaire

5.1.3 Interview Method

I always ensured an interview location that was quiet and private, and that enabled the subject to feel comfortable about speaking freely. The knowledge that I sought can only be legitimately accessed by obtaining qualitative data via direct and open communication with my subject. My objective was to extract the nuances and complexities of life and experience within their project. The intention then was to transform the subject's tacit knowledge into abstract explicit knowledge with a view to gaining a deep understanding of the research phenomenon.

Interview questions were focused on experienced phenomena, and were concerned with drawing out each person's subjective interpretation of their everyday project experiences and recollections. The questions were open and empathic, not leading; the emphasis was upon encouraging the subject to explore his or her experience and interpretation of the many facets of the project phenomenon. Every effort was made to avoid questions that might imply any suggestion of preconception or expectation: it is essential that the subject's responses and reflections are not influenced or coloured by the interviewer's interlocutory style (Goulding 2005). The interview was recorded and the duration was typically 40 – 50 minutes.

5.1.4 Questioning Technique

I discovered that the most effective opening question was "What aspects of the project do you now find most memorable?" This was an invitation for the subject to reflect on the project experience and reveal those musings and observations that are now foremost in mind; this question tended to focus the interview on personal and cognitive influences and away from the procedural and technical elements that are so important in the world of information technology. As the respondent talked, I would internally register signals of interest that I wanted to explore further; when it was appropriate I would ask: "Can you tell me more about…?" By this means I was able to capture the major influences and memories that had affected the individual's Lebenswelt. It also provided descriptions of cultural and relationship issues, problems that were encountered, decisions that were made and their outcome. Information gathered in this way tended to be full of rich experiential material with many significant quotations and anecdotes.

As the interview progressed, I discreetly referred to a checklist in order to ensure that the essential experiential aspects were being drawn out. The checklist is shown in figure 5.3.

Positive aspects of the project
Negative aspects of the project
Project practices and their outcomes
Meetings and communications
Nature of internal project relations
Project internal structure
Relationships with sponsor/vendor organization(s)
Evidence of coaching or mentoring practices
Project team location(s)
Project review practices
Evidence of team learning
Project management office involvement
Creation of explicit project knowledge
Propagation of knowledge into the organization(s)
Nature of personal learnings
Project outcome and reflections

Figure 5.3: Interview Checklist

In order to build the complete project picture, it was necessary to ask more specific questions if the open discussions did not present an opportunity to explore particular aspects that I wanted to understand. For example, I would ask such questions as:

> "Could you explain to me more about the way the project team was structured…?"
>
> "Was there any attempt made to record the new knowledge that you created…?"
>
> "What do you think that the sponsoring organization might have learned from the project...?"

"Was there a post project review performed…?"

"Was there a project management office involved…?"

"How has the project outcome been assessed…?"

Questions such as this would generally open a new line of discussion, and from there I could continue with prompts such as "Could you explain that in more detail…?", and I could then continue to assemble my deep investigation into the individual's experience.

5.1.5 Refining the Interview Process

Naturally the interview process was improved and refined as the research progressed. The most difficult aspect was undoubtedly the bracketing of my own experience and knowledge of the subject under review. Initially there was a tendency to frame questions that "coloured" the response, such as "How supportive do you think the management was towards the project?" which invites the respondent to reply only in terms of the support of the business. My own experience tended to guide me into that type of question, because I am aware support is so critical to project outcome. A more open question, inviting a more productive answer, is to ask "How did the management view the project?" which can lead into a much wider discussion of benefits and outcomes. The critique that my supervisor performed of my interview transcripts was invaluable in helping me to improve my questioning technique. The first few interviews, whilst I believe their content was entirely valid, lacked some of the depth and richness I was able to derive in the later stages of the research.

Another shortcoming apparent in the early interviews was that I attempted to work without a clear written checklist, but depended largely on memory to gather all my key elements of data. It was then sometimes necessary to follow up with e-mails and phone calls to the interviewee to complete the picture. When I had developed my checklist (from about interview 5 onwards) I found the need to make supplementary contact much reduced.

5.2 Interpretation and Classification

The next stage was the verbatim transcription of the interview, presenting a completely accurate record of the subject's recounting of his/her experiences and recollections. The transcript was carefully studied and units of interest were drawn out. Such units are

variously termed "units of meaning" or "significant statements" by other phenomenological researchers (Ardley 2005; Goulding 2005). I prefer to employ the term units of interest, because at the extraction stage I am concerned with identifying relevance to my research rather than ascribing meaning. The extracted units were then subject to hermeneutic interpretation so that I could understand the meaning of each unit in the context of the whole project experience, and classify them for the purpose of recognising common themes. The interpretation process is illustrated in the diagram below:

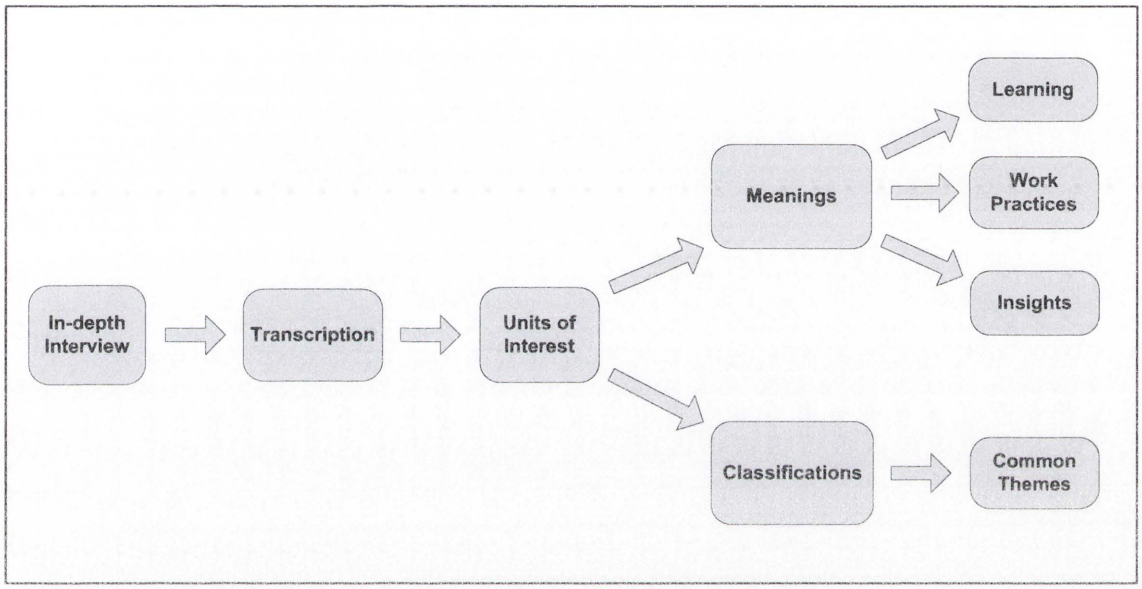


Figure 5.4: Schematic of the Data Interpretation Process

5.2.1 Units of Interest

The completed interview transcripts were reviewed and scrutinised both by me and, independently, by my supervisor, with the objective of extracting the elements or units that are pertinent to the understanding of each project context. The review process was performed manually by printing out the transcript, studying it carefully, and marking it up where appropriate. Units of interest were identified by various indicators: a description of a work practice; an account of a political or cultural feature that impacted the project; a reference to a project action that worked well or poorly; an emotive word or phrase; the expression of an opinion; an account of how knowledge was created; and learnings that may have been gained at the personal, team or organizational level.

A list was manually compiled of the units of interest that were evident within each interview transcript. At the extraction stage no interpretation took place; they were

expressed in the same terms as used by the subject. My supervisor produced his own list, and I compared it with my list, and merged them into a spreadsheet. This provided an invaluable form of triangulation and minimised the possibility of personal distortion of the data, because identification of a unit cannot be fully objective. This independent review was particularly valuable because of my own personal exposure to the discipline under research, and the inherent difficulty of maintaining an impartial perspective. Each interview yielded between 15 and 40 units of interest that were pertinent to my research, with an average of 27 units.

5.2.2 Hermeneutic Interpretation

Hermeneutics may be defined both as an underlying philosophy, and a specific mode of analysis (Bleicher 1980). In the philosophical sense it may be seen as the development and study of theories of interpretation, and as a mode of analysis it may be used to gain an understanding of texts (Myers 1997). In the context of my research, hermeneutics involves cultivating the ability to understand things from somebody else's point of view, and to appreciate the cultural and social forces that may have influenced their outlook. The units of interest gathered from my transcripts were subjected to critical scrutiny and evaluation, with the objective of making sense of each part in the context of the whole. This is the concept of the hermeneutic circle, which refers to the dialectic between the interpretation of the parts leading to an understanding of the whole (Heidegger 1927). The theory of the hermeneutic circle is illustrated in figure 5.5:

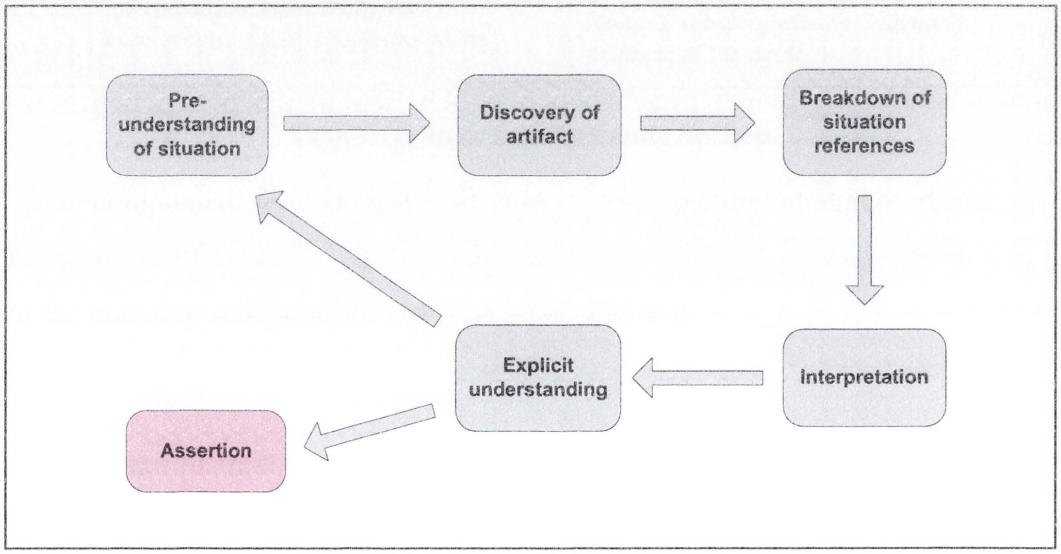


Figure 5.5: The Hermeneutic Circle

Based on Heidegger (1927)

The steps in the functioning of the hermeneutic circle have been usefully elucidated by Stahl (1993) and in the following table I have juxtaposed Stahl's description with the application of the circle theory in my research context:

Step	Stahl's Narrative	This Research
1	An initial pre-understanding discloses a world from a certain perspective of possibilities.	In terms of my context, my pre-understanding relates to the mental picture that I am constructing of the project under research.
2	The artifact is discovered and understood as something in terms of the situational network of references.	The artifact is the unit of interest that I am interpreting so as to understand where it fits in the project framework.
3	However, the references are inadequate for understanding the artifact and there is a breakdown in the network.	The unit may not be readily identifiable or classifiable.
4	The artifact is interpreted by laying out the implicit references and repairing the break in them.	By reference back to the partially constructed image of the project, and careful consideration of the unit, its position is determined.
5	This makes explicit the understanding of the artifact as such and such a thing.	The unit can now be classified, and another constituent in the overall picture is in place.
6	The new understanding can then be asserted in language and communicated or it can revert to tacit understanding.	The growing comprehension of the full project situation enables the development of theories and assumptions that can be utilised within the body of the research.
7	The revised tacit understanding forms the pre-understanding for any further interpretation, completing the hermeneutic circle of understanding.	The process can then move on to consideration of the next unit, with the knowledge and understanding of the research subject growing with each iteration of the cycle.

Figure 5.6: Steps in Hermeneutic Analysis

As each component was analysed in turn, a rich picture emerged of the project phenomenon in its entirety. As the understanding progressed, an expectation was built about the meaning and significance of each new element.

5.2.3 Classification and Grouping

When each unit of interest had been interpreted in the context of the whole project, it was then possible to understand its meaning and significance and classify it according to one of my groupings.

I have not limited my groupings only to my specific areas of research, that is, learning and associated work practices; I believe that it is essential to include all significant aspects of the project context to gain a full understanding of the dynamics that influenced each one. Each unit has been assigned to one of six groups that correspond to the fundamental areas of knowledge that was sought:

Class	Grouping	Further Clarification
A	Project structure and management, techniques and work practices	These units relate to the internal structure of the project entity, and the work practices employed therein
B	Organization background, environment and culture	These units relate to the sponsoring organization, its background and culture, and the setting in which the project operated
C	Project / Organization relationship, politics and empowerment	These units relate to the interaction between the project and the sponsoring organization
D	Learning and knowledge creation	These units relate to the learning that has taken place, at the individual, project, and organizational level
E	Project outcome	These units relate to observations about project success or failure
F	Observations	Those observations made by interview respondents that could not be readily classified as above, but provided interesting insights into the project milieu, and in some cases were a guide to a mental model

Figure 5.7: Classifying Units of Interest

5.2.4 Dominant Themes

When the classification of each unit of interest was complete for every project, I was able to combine within spreadsheets the corresponding material across the entire range of my research. The research process produced over 600 units of interest, and because of the volume of material that was to be analysed, I found it necessary to subdivide further the classifications shown above. Some of the information could be organized into subgroups quite readily, for example:

- Class A units were subdivided into Practices, Structure, Management, Communication, and Location

- Class D units were subdivided into Individual Learning, Team Learning, Organizational learning, and explicit Knowledge Creation

The other classifications were less susceptible to deconstruction, and remained largely within their major groupings.

The grouping of similar units of interest across the entire range of researched projects enabled each project to be compared and contrasted against the others. The information in the spreadsheets was searched and sorted to highlight points of comparison. The spreadsheets retained the project identifier and unit number, in order that I could readily reference back to the marked up transcripts. As the analysis progressed, the complete picture of my research started to materialise. There have emerged dominant themes that feature across most or all projects, and there are reducing degrees of dominance from "ever-present" down to "occasional but significant". There have also been many "interesting outliers". From the rich base of material and the in-depth analysis I have performed, I believe I have achieved my research objective of a profound understanding of the project learning phenomenon. Arising out of this understanding I believe it will be possible to identify ideal structures and work practices for IT project teams, consistent with a successful outcome and maximum opportunities for learning at both the organizational and individual level that can successfully be used in improving future project outcomes

5.2.5 Limitations within the Research

The most obvious limitation in analysis of interpretive research data is that it is subject to the interpretive bias of the author. The analysis is an authentic and honest reflection of the data collected, examined and classified during the course of the study, using phenomenological and hermeneutic techniques to the best of my ability. In all aspects of the process of research and analysis I have been expertly guided by my supervisor. However I take full responsibility for the interpretation of that data, and it is possibly coloured to some extent by my own Lebenswelt: my own experience as a project practitioner and business consultant. I may have constructed meaning or drawn inference where others would not, and conversely, overlooked elements that others may perceive as significant. This potentially leaves some insights and reflections contained within my discussion open to challenge from those who may construe the presented information differently.

The research is also open to criticism from those who might suggest that researching 24 projects is insufficient to gain the depth of understanding that I seek. As discussed in Chapter 4, a very wide range of projects has been researched. In this chapter I have made reference to the substantial volume of data that has been extracted and analysed. I am not convinced that increasing the number of projects researched would have materially changed or enriched the results that are presented in the later chapters of the thesis. As the quantity of data is increased, the task of analysing, comparing and contrasting becomes more challenging, and the outcome may be no more valid. This issue of quantity versus quality has been recognised by Sanders (1982: 356) thus:

> *The first critical rule for the phenomenological researcher is: more subjects do not yield more information. Quantity should not be confused with quality. The phenomenologist must learn how to engage in in-depth probing of a limited number of individuals...too many subjects can become overwhelming.*

Certainly, the volume of data that I was manipulating was extensive, and the task of defining valuable themes and comparisons would have become increasingly complex and protracted had I introduced more projects. On balance, I believe that the decision to conclude the research after 24 interviews was judicious. In the next chapter I introduce the presentation of the results of my analysis, commencing with an exploration of the variability of each project's situation.

CHAPTER 6: UNDERSTANDING THE PROJECT MILIEU

6.1 Introduction

In order to understand the learning characteristics of projects and the associated work practices, it is necessary fully to comprehend the meanings behind the researched units of interest and the groupings into which they fall. The units discussed in this chapter are those that relate to the three significant sets of variables of each project's circumstances. These are:

1. The setting or background within which the project operated;
2. The internal project structure and practices; and
3. The relationship between the project and the organization(s).

I have examined, compared, contrasted, and drawn meaning from, these significant aspects of each surveyed project. This has imparted a rich insight into the project experience: the skills, techniques and knowledge that have been utilised, and thence to an understanding of the complex milieu in which learning occurs. The three major headings within the cloud diagram below represent my attempt to encapsulate the three sets of influences that find form within every project:

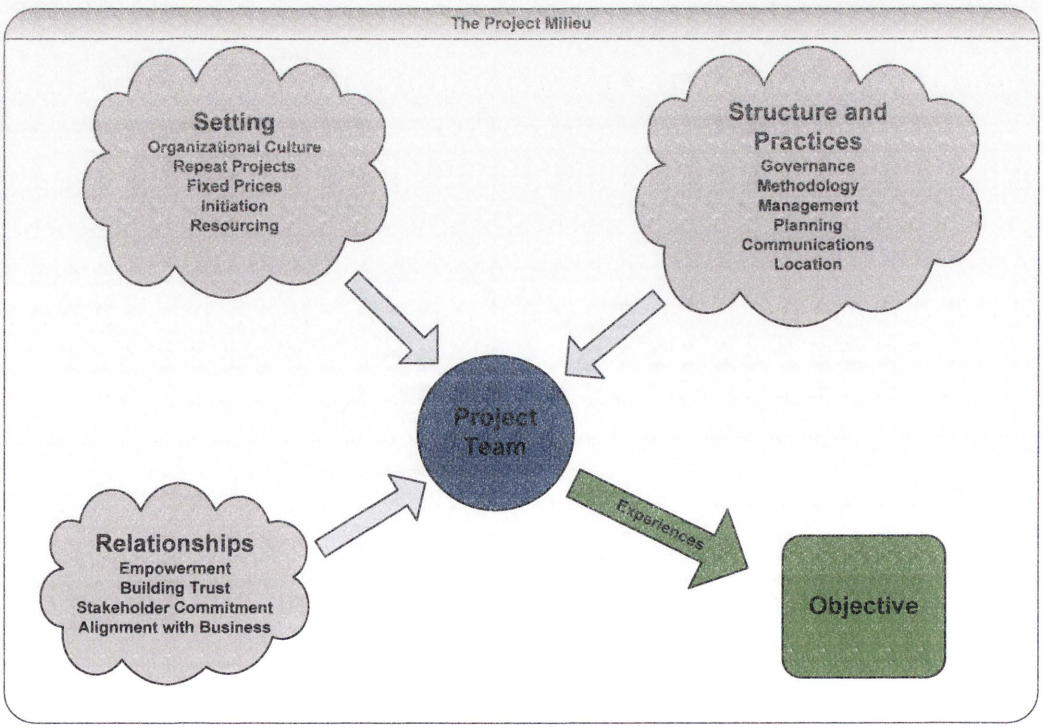


Figure 6.1: The Project Milieu

Within this chapter reference to individual projects has been made by number in the range 1-24. The same number is used in referring both to the project and the interviewed subject. A summary of the characteristics of the researched projects and interviewed subjects is supplied in Appendix 1, a brief description of each project is available in Appendix 2, and an indication of project size and composition is provided in Appendix 3. To support the analysis of my research I have included a substantial number of verbatim quotations from my interview transcriptions. I believe that these add life and richness to my findings that is difficult to achieve in prose alone; they also illustrate the practicality and pragmatism that was communicated by many respondents.

6.2 The Project Setting

In this section I have examined those units of interest that relate to the environment in which each project operated. Recognising the project setting or background is an essential prerequisite in the comprehension of the learning opportunities that are presented. The project team members need to identify the different aspects of the setting and may require to adapt their approach, both at the individual and the project level, to accommodate these factors. In general, the project entity may have limited ability to control or even influence these elements, which are either external to the project itself, or precede its commencement.

I have grouped these factors under four headings. Firstly, it is essential to understand that in many project settings there are multiple organizations involved in their composition, and this can have a profound effect on project dynamics. Secondly, it became apparent that almost every project was affected by the culture of its sponsoring organization, and it is important to recognise the effect of this on the conduct of the venture. Thirdly, the introduction of a fixed price vendor component, which is frequently mandated by the sponsor, can create a complexity that appreciably impacts the project situation. Finally, there may be elements in the initiation process, or the circumstances in which the project came into being, that are inherited by the project and which become significant during its execution. Across the body of the research, the project settings varied very widely and when these are analysed in context, there are many clues as to the project direction, learning drivers, and ultimately the conclusion.

6.2.1 Project Composition

The recognition of the different organizations that are included, and the contribution that they make, is the first significant variable in the understanding of the project phenomenon. The composition of a project has a profound impact on its politics and dynamics, and I have identified three major project profiles:

The **single organization project**, where the project is conceived, developed and implemented by an in-house team for the sponsoring organization. This is the simplest project model, and provides the organization with the greatest degree of control; however in many instances this simple model is not an option because the project requires specialist skills, or the provision of a software package by an independent software vendor (ISV). Six of the researched projects (one-quarter) fell into this category.

The **client/vendor project** embraces the situation where a third party vendor is contracted to deliver part of, or the entire, project. In some cases project delivery is the responsibility of a combined team, comprising members from both the sponsoring and vendor organizations. In other cases there may be two separate teams, not necessarily co-located. I identified ten projects (out of 24) that met this profile.

The **multiple-vendor project** describes the more complicated case where two or more third parties are involved in the project provision, usually supplemented by participants from the sponsoring organization. Again, it is quite usual for these teams to be physically separate, and sometimes not in the same city or even the same continent. Eight of my projects were considered to be multi-vendor.

I have found that it is very important to understand the viewpoint which the interviewee represents: a project team member working for the sponsoring organization has different learning drivers and objectives compared to a person acting for a vendor.

6.2.2 The Prevailing Organizational Culture

During the course of the research it became apparent that the culture within projects rarely mirrored that within the sponsoring organization. Projects seemed largely to co-exist with their organizations without necessarily reflecting any cultural inheritance. The culture of the sponsoring organization was either specifically referred to, or made apparent by implication, in the great majority of the research interviews (20 out of 24).

The extent to which the prevailing culture impacted the project varied widely: in some instances it was a major obstruction that required constant working around, in others it was merely a hindrance that was an accepted component of the task, and in some cases it was a positive force that actually encouraged the team in their endeavours.

Many of the project endeavours were undertaken within a cultural environment that brought an added complexity to their functioning. Perhaps the project that operated within the most resistant culture was number 21. The sponsoring organization is an acknowledged world leader in its market segment, and although a publicly listed company, is still very much controlled by the founding family. According to my interviewee (the project director) the internal structure is not a simple hierarchy, but is better defined as a feudal patriarchy, in which only the family members have any real power of decision. The company is a hostage of its own success: it has grown from the ground upwards to its present position of domination without any perceived need to develop anything but the most basic business processes. When the organization engaged experienced project leadership to develop an advanced web-based application, the incumbent management were exposed to a professional process of project governance with which they had no affinity, and of which they were highly suspicious. The project director found that she needed to protect her team from the line management and the established culture in order to maintain her team's impetus:

> *The main thing was to keep the management away from them, because they [the management] were devoid of any emotional intelligence at all. I had good relationships with my people...if their mode of working was that they needed to start working at 10am and finish at 10pm that was fine with me. That is a big problem in [the customer] because it is very much an 8am till 6pm company. They don't seem to care if you actually do any work during those times, but if you look busy and you are there wearing your suit, that's what they care about. So I was managing a little microcosm of empowerment and collegiality within this command control organization. I was trying to hide it from them!*

The project team was required to work with the marketing department in order to establish requirements, but trying to engage with them was initially completely unproductive. The marketing manager had no understanding of business process, and hence no comprehension of what features a new system might contain or how it might assist her staff. After some difficult initial meetings, the project team decided that a radically different approach was required. Traditional requirements gathering was abandoned, and the team improvised a methodology that suited the circumstances:

> *I think if you were not pragmatic there, you would have gone completely nuts. And they would have gone nuts too, so it would all have come to a bad end. In the first six weeks I said to the PM we are going to throw all of our methodologies out of the window, and we are going to work from a task list, and have daily scrums, and a whiteboard. That was all we could do.*

The timely adoption of the flexible approach enabled the team to engage effectively with its stakeholders, and ultimately a successful solution was implemented. In fact, the team was able to cement its success by insisting on its own data centre to operate the new website because the regular IT service was demonstrably unreliable.

Those organizations based upon traditional hierarchies tended to create obstructions that were required to be counteracted by the project team. Project 5 concerned the implementation of an information security standard in a government department. The project manager described the department as "absolutely resistant to change" and recognised from the outset that unless the management of the department fully supported the venture it would likely fail. The approach taken was to ensure that the senior stakeholders understood that they were the system owners, and the PM assumed the role of delivery agent:

> *I think that the change came about because ownership was never mine. I pushed the ownership onto the stakeholders, because they had to believe that it was their system, otherwise it was never going to work. I was only employed as a contractor, I was not employed as a permanent member of staff to start this job, run this project, and then stay with it forever...my biggest concern was that I would put in all this effort, and then the system would fall down. So I got their agreement that the system was never mine, it was theirs, I was building it for them and they had to look after it. I think that the culture change came because they were involved. I would not let them not be involved.*

The handover of ownership proved to be a very effective strategy: the stakeholders assumed responsibility for the procedural change that was required, and ultimately the security standard was implemented in practice and signed off by the auditors.

A number of respondents commented on the difficulty of instilling any sense of timeliness or urgency upon their stakeholder group. A project team is frequently accustomed to operating to a tight schedule and within a budget, while a key member of the sponsoring business may perceive the project as a distraction, or even something to be actively resisted. Dealing with opposition can account for the majority of a project

leader's time, as observed by interviewee number 1, who was managing a major infrastructure rollout in a semi-government body:

> *It was difficult from the point of view of the odd few people that wanted to fight everything that you were suggesting or proposing or trying to implement, and they would come up with silly arguments why this or that should not happen. They are the type of people who account for only 1% of the voice and account for 90% of your time, because of the need for managing and mitigating their objections. It was difficult to progress the project from that point of view.*

This project experience was fortunate in that it was internally funded, and delays caused by recalcitrant stakeholders could be accommodated; the vendor involved in Project 6 was operating under a fixed price contract and stakeholder non-compliance caused significant frustration and additional expense, as the project manager complained:

> *We needed to get access to their people in a timely manner, and we would lose hours in a day, just trying to get at them. And when you did you would only get them for a small snapshot of time, and then they were gone, and you wouldn't see them again. That had a major effect on the time factor and also the frustration level of our team, because they were ready to go since they were full-time committed. The people who were on the other side were not full-time committed.*

Another example of conflict of cultures between project and business occurred in Project 17. The project was severely time-challenged in its latter stages and long hours were necessary; the team comprised staff from both vendor and sponsor sides. The vendor workforce were accustomed to long hours and operating under pressure, but this was quite counter-cultural for the business members of the team, as noted by the programme director:

> *We worked heaps of weekends, the project guys were used to it, they do that all the time, but some other people we drafted in were not used to it. And then the business guys were prone to complain, they have a lot of stuff about OH & S and meal allowances, and all sorts of stuff that we don't concern ourselves with. In the project space you get a different sort of culture.*

Again, this illustrates the different mindset that project participants develop, and how this can be at variance with an organization's accustomed mode of working. The same respondent indicated that he had frequently encountered the same issue before:

> *What I have found pretty regularly is that, when you go into a business to run a project, the business people don't know what projects are about. They don't understand what a deadline is, they don't understand what a schedule*

is. They don't understand that you have a vendor over here who is on a fixed-price, who has a fixed scope, and needs to get his work done.

Not all projects found themselves in opposition to the organizational culture; Project 19 took place within the eCommerce subsidiary of a large and fast-growing media organization, which is conditioned to rapid development and change. The project was very ambitious and stressful, but as the project manager said "The culture here is to do more with less, and everybody does". The PM posted fortnightly reports about the project progress, and, uniquely within the research, he received communications of encouragement from stakeholders recognising the pressure he was enduring. His comments are indicative of a setting that embraces development and transformation:

...this organization is pretty immature. This part of the organization has grown from one hundred people to five hundred people in 2 ½ years...the way this organization is structured there is not a lot of hierarchy, and not a lot of processes. There is not a lot of management support, but there are great expectations. The way that projects are done here is by influencing, by having relationships.

In another instance the sponsoring organization behind Project 23 was described as "very, very competitive" and information technology was not centralized but distributed across the lines of business. The business division involved possesses considerable autonomy, and IT was perceived as one of its principal means of gaining competitive advantage. The project that was launched was extremely ambitious, and it was very much business-driven rather than technology-driven; there was no concept of a team that was responsible to a sponsor, the business division effectively became the team for the duration. There were no issues with "countering" a resistant culture, and when the project budget was exceeded there was no blame associated with any particular group. The interviewee commented "when costs ran over they were so immersed in it themselves they were not too quick to judge. Perhaps it's a consequence of this close-alignment of IT with the business...there was no finger-pointing."

There were only four projects in which no cultural references were made or implied. Interviewee number 13 was a developer whose orientation was very much technical, and who had little contact with the wider organization. Number 14 was a very troubled project in many respects and the problems were so consuming that cultural issues were largely inconsequential. Projects 15 and 16 were researched from a vendor standpoint;

both systems were developed offsite, and the cultural implications of changes to end-user processes were not within the vendors' scope.

6.2.3 Fixed Price Vendor Agreements

Seven of the researched projects involved a fixed price delivery component that formed a significant element of the project experience. As we have seen, projects have historically demonstrated a propensity to overrun time and budget allocations, and this has been a great source of concern to both IT and business management. One of the traditional means of containing costs on information technology projects has been to engage a vendor and negotiate a fixed price agreement. Fixed price operations impose a discipline on all parties, because of the need for precise specifications and rigorous change control. There is a strong theme that suggests that, far from being a convenient means to contain costs, the fixed price contract can be a major source of conflict and dissatisfaction.

Among the more challenged projects based on fixed price agreements, Project 10 failed completely, largely because of the incompetence with which the vendor negotiated the contract. The vendor was based offshore and wanted to establish an Australian presence: as a consequence they signed an exceedingly demanding contract with a local organization, with a very aggressive timeframe and a heavily discounted price. This appears to have been a sales-driven agreement that was not subjected to sufficient scrutiny for technical feasibility. The sponsor refused to give any ground on time and cost, and the vendor effort started to fall seriously in arrears. The project interviewee declared:

> *We were saying: we need more resources, we need these deliverables, we need to keep to the schedule, but it just wasn't happening. It became very evident that the systems integrator was not experienced enough to pull it off. They didn't have enough good experienced people on the ground here in Australia to deliver.*

The project participant and a number of other local experienced team members were retrenched when the project was cancelled. The outcome was losses all round: the vendor lost money on the contract, lost a customer and lost heavily on credibility. A number of skilled project people lost their jobs, and the sponsoring organization lost the services of these valuable staff members together with "several years' worth of systems development and changes".

Another example of aggressive marketing leading to a seriously challenged project was Project 6. In this instance the vendor was a highly experienced international consulting firm, but they signed a fixed price contract with a government body that failed to include provision for adequate resourcing or commitment on the customer side. As a consequence the customer failed to provide the necessary support to the project and refused to negotiate after the event. The vendor was placed in the very difficult position of extracting the necessary information from a customer that was uncooperative, and where they had no financial or contractual leverage to apply. Although the vendor attempted to operate to a stringent project management methodology, the customer consistently failed to attend meetings, and largely ignored the schedule and deliverables that were required of them. The project became critically late and was internationally alerted through the vendor's project management office. Ultimately the project was delivered, but at a substantial financial loss to the vendor and many months late for the customer.

Not all fixed price agreements had such unfortunate conclusions, although they clearly created complications for both vendor and sponsor. Project 3 was the subject of a fixed price software development negotiated between a bank and a major vendor, and there were delays totalling three months while disputes over the terms of the deal were resolved. This was extremely costly to the sponsoring organization, but the management determined that they preferred to wear the delays and the expense rather than concede anything to the vendor. A significant amount of project resource was expended in managing specification changes and negotiating with the vendor.

Project 23 involved a fixed price quotation by an offshore development company for a major financial application, which ultimately cost "probably double the original quote, and double the original time estimate as well". In that instance the organization accepted the overrun because they drove a very hard bargain originally, and numerous substantial changes were made as the project progressed. Project 7 changed part-way from time and materials costing to a fixed price model, and "of course that changed the relationship between the parties". From the change point onwards, the vendor was constantly managing change requests to determine whether they should be accommodated within the fixed price, or whether they were to be the subject of a quotation for additional work. The respondent observed: "it was a major effort by the

team leaders creating the paper trail that was required for every change request, updating the documentation, and ensuring it was communicated to the relevant people".

Project 14 was another example of a naïve and inexperienced vendor quoting for work that they were really not qualified to undertake. In this instance a senior programme director from the customer side assumed control of the project and initiated a rescue process. The time critical components of the project were taken back from the vendor and completed in-house, while the vendor was left to struggle with the remainder. The balance of the project was finally delivered over six months late: the vendor lost heavily on the arrangement, but the customer's urgent requirements were met through their intervention in the process. The programme director (the interviewee) was very experienced in managing fixed price agreements, and in vendor relationships generally. This comment from her encapsulates her experience on fixed price operations, and was the most intuitive observation on the subject from any of my respondents:

> *Provided fixed price agreements are properly managed, they should cost the same and deliver the same outcome as Time and Materials. It is essential to build in a contingency, maintain the relationship, and manage all the commercial aspects. An effective change control mechanism is imperative. It is also essential to check the details of the quote, look for obvious discrepancies, and challenge them if there is anything that you are not comfortable with.*

Negotiating and managing fixed price agreements seems to be a major area of potential difficulty for both sponsor and vendor alike. Since they are perceived as a powerful means of containing costs, they will remain a fundamental part of the information technology industry, and learning to handle such agreements will continue to be an essential project management attribute.

6.2.4 Project Initiation

Several of the participants mentioned the importance of ascertaining that projects are initiated properly, and that the penalty for failing to ensure this can be severe. In this context, initiation is the process of establishing the business case, assignment of overall responsibilities, and identifying human and financial resources. Number 3 was a very large business-critical project, and in the opinion of the interviewee it was soundly based and possessed all the prerequisites to ensure success:

> *[The organization] is a very mature IT shop. They knew that they needed to do a proof of concept, and nothing would go ahead until a proof of concept*

was complete and approved. We had a proper team of business analysts, and we specified the requirements, and we had a proper development environment, and a proper test environment. We had a proper software code repository.

Project 3 proceeded to a satisfactory conclusion, albeit late, but Project 4 was less fortunate. After the sponsoring organization had been taken over, and following a review by the incoming management, the project was cancelled. The interviewee held the opinion that perhaps the business case for the project was flawed, and cancellation was based on a realistic reassessment of the economics; he commented: "I don't believe that what they were doing was cost-effective, and it probably was not a smart way to address the problem".

In another instance, the manager of Project 6 was drafted in to rescue his project after it had been quoted in haste by the vendor (his employer), and commenced by a less experienced colleague in a very unstructured fashion. The failure to establish contacts and ground rules from the beginning ultimately cost the project dearly both financially and in terms of human capital. The project manager made the observation: "...with a project if you don't initiate it right, it never goes right. That's why it was a very, very difficult project".

The respondent for Project 24 also held the opinion that the launching of his project had been poorly handled by an inexperienced (or possibly uncaring) leadership. In this case he felt that the team was seriously deficient in resourcing. As he commented: "I think that resourcing requirements had been severely underestimated. You could see on the testing side, and also on other aspects of the project that there was an inadequate level of resources to manage the workload".

Experience seems to be a key attribute in the proper grounding of projects. Interviewee number 12 was a system architect with extended experience (15 years) at his organization, and he made a number of comments about the difficulty of making realistic estimates at the initiation stage:

Another big bugbear of mine is the estimation process. In the engineering field they have so much that they can draw on. They have built this building, or this road, or this bridge [before] and they seem to have it down to a fine art. They can estimate very well and they have defined processes. In IT, and I don't know why it is, every project seems to be unique. When you are asked to estimate something, it's never been done before. It might be the same system, but you haven't implemented it in [my organization] before,

and you haven't come up against [my organization] methodology before. There is always something unique about an IT project.

The same interviewee was very dismissive of the efforts made by inexperienced team members to make credible estimates. As a senior practitioner he was frequently involved in the coaching of younger participants, and he recounted the type of conversations he would hold with them:

When you are mentoring programmers coming through the organization, and you ask them for estimates, it's quite humourous, because a lot of them will underestimate significantly. I'll say to them, double it... double it... now double it again... that looks more reasonable. That's my experience coming through, because I've done similar things in the past. When you are asked to put the whole project estimate together it's very difficult.

Project 2 involved the development and implementation of a Materials Requirements Planning (MRP) system within a manufacturing company; in my experience a seriously demanding assignment. My interviewee was an experienced business analyst, who had undertaken such tasks before; he was favourably impressed with the quality of the foundation that was laid prior to commencement of the activity:

I liked the fact that it was right sized...the managing director of the company was in charge, and he was the project manager, and the source of all requirements. My job was to turn his requirements into a functional design and make it work with the aid of programmers and people from the business to do the testing...also, all the people involved were confident in what they were doing. The business owner was running it, the financial controller was overseeing the budgetary aspects of it, the supply chain manager was providing the main interface to the business, and I was specifying the code that needed to be written. So, all in all, it was one of those projects that work nicely.

In the case of Project 2, the interviewee declared more than once that the project "felt right" and that he was confident throughout that a successful result would be delivered, as indeed it was. He was involved from the initiation stage and was able to influence the establishment of the ground rules; although he was not part of the leadership, his long experience provided him with considerable power of persuasion, and he was able to guide the venture in the right direction.

Finally, there may be significant history associated with the endeavour: a remarkable number of projects were second or subsequent attempts to implement a system where there had been previous failures. The phenomenon of the multiple-attempt project and the associated learning is discussed in Chapter 7.

6.3 Project Structure and Management

These units of interest relate to the internal structure of the project entity, and the work practices employed therein. The structure of the project varied in every case and was dictated by two major factors: size and complexity of the project, and the number of parties involved. These units represent those aspects of the venture over which the project entity may have a significant level of control. There may be certain restrictions around the use of prescribed governance and methodology techniques, but the research suggested that these were far from immutable. Likewise the physical location provided by the organization was not always an absolute fixture. The inevitable perception is that the more significant the project presence, the greater level of control and influence it is able to exercise.

6.3.1 Project Governance

During the course of each interview it became clear how each project was organized and governed. The level of formality varied widely, and the balance was definitely tilted far more towards the formal end of the scale as projects grew in scale and complexity. I have identified nine projects, that is more than one-third of the total, as having a formal governance structure that endured for the life-cycle and which was adhered to fairly rigidly. Of these nine projects, seven were assessed by me as being large scale, and the other two were medium scale. Formality implies a regime that is planned, controlled, and monitored regularly, and the traditional "waterfall" approach to system development (or a variant thereof) appears to have been the method of choice in these project situations. The waterfall model is described by Cotterell and Hughes (1995) thus:

> *This is the 'classical' model of system development...there is a sequence of activities working from top to bottom...the limited scope for iteration is in fact one of the strengths of this process model. With a large project you want to avoid having to go back and rework tasks that you thought you had completed.*

Across these nine instances there was in every case an acceptance (either tacit or explicit) by the interviewee that this was the correct and legitimate approach to managing a large and complex endeavor. This quote from Respondent 3 summarises the method of operating within that project, which was generally representative of others within the same group:

> *We also had a formal scheduled meeting with the business once a week. We used to meet with the developers regularly as well. The developers also had their own scheduled weekly meeting, and they had their own project plan they were working to. When they started the development of a particular component they would have regular checkpoint meetings...they would then proceed through the development cycle, they would advance to unit testing, and thence into the system testing, with checkpoints each step of the way. It functioned well, and everybody knew what they had to do. We had a published project plan, a published development plan and a published testing plan.*

This project was notable in that the "project resources were the best the vendor could make available, and the leadership was very capable and very knowledgeable". The other projects governed in this way displayed similar attributes, with precise assignment of tasks and duties and clear reporting lines. The most rigidly organized project was probably number 22, which was the largest project researched, and which operated almost as a production line. The interviewee for this project was part of the leadership and observed:

> *Basically we had first class processes...there was very strong governance and processes. There were very good people on both sides. The [first sponsor] side were very good, gung-ho, let's get things done, let's cut out the nonsense and learn from our mistakes, and learn fast. The [second sponsor] side had very good technicians, with a safety first approach. Then there was [the vendor] who would bring a different perspective on the processes and the project management practices.*

The project needed to blend effectively the different cultures and practices of three different organizations and the leadership appears to have achieved this by adopting the best practices from each of the contributing parties. The formal hierarchical structure of these projects appears, for the most part, to have served them well. The drawback of the regulated environment, from the viewpoint of the specialist participants, seems to be that it could restrict free interchange of ideas and creativity, as observed within projects 1 and 4. For example, interviewee number 4 commented: "Everything had to go up the chain at the right pace, and to the right level. So if I had a problem, I had to speak to my manager, and then he would speak to his manager, and so on up the chain".

There was an interesting series of projects, six in total, that embraced a "formal but flexible" approach. They adopted a minimum set of formal procedures, such as regular meetings, maintenance of records, management of stakeholder relationships, and timely status reporting. However, they also displayed considerable pragmatism and flexibility

during the course of project delivery because they were dealing with dynamic situations that involved encountering the unknown and the unexpected. In some cases these projects deliberately set out to follow the principles of an "agile" development model, others adopted the flexible approach because it was an effective way to operate in a dynamic and demanding business setting. The agile approach is a generic term for a number of development methodologies in which initial planning is minimised and the project is broken down into small work units assigned to different teams. The objective is to provide a more flexible and adaptable environment than the rigid waterfall approach, but it depends heavily on close teamwork and collaboration to be effective. Project 19 employed a modified version of an agile technique that ultimately worked very well in their situation:

> *The methodology we have developed here is based on agile. It doesn't have a lot of structure to it...because we have to develop quickly. In general we followed some of the agile principles, like collaboration and do-just-enough in terms of documentation. There were so many components, and it wasn't your typical software development...there were a few unknowns. So we started developing parts of the product and we learned and we adjusted our requirements, and found what was possible. It was continual adjustment until the end when we understood every component of the product.*

Another project that exhibited great flexibility in its approach was number 20, which was engaged in enabling business applications via an offshore service provider. Again there were many unknowns along the way, and the team needed to be fast-moving and adaptive, which it combined with sufficient formal governance and discipline to satisfy the rather traditional sponsoring organization. This was an interesting example of a project that was granted a dispensation to operate outside the standard governance framework because of its highly politically charged nature.

Absence of Governance

There were instances where proper governance was attempted to be implemented but it conspicuously failed. A governance model really only functions if all stakeholders subscribe to it, and without that general endorsement the governance provisions do not lead the project in the intended direction. The vendor in Project 6 employed a formal governance regime but was unable to leverage the customer's timely contribution, which propelled the project into a highly challenged situation. Similar circumstances were observed in Projects 10 and 14, except that in those cases the customer attempted

to impose formal governance upon a vendor and failed to obtain the required deliverables within the project timeframe.

There were three projects in which there was an apparent abdication from most aspects of formal control, and it is perhaps unsurprising that these were among the least successful of those researched. One of these was the One.Tel billing project which is discussed in more detail later in this chapter.

The project exhibiting the least evidence of formal governance and processes was probably number 15, from which the following quote is interesting:

> *...it was very informal...this project was kind of in no man's land. There are two main methodologies for projects. You can have upfront design, which is the traditional way, where everything is agreed upfront and then the work begins. Or there is the agile approach. This project was kind of in the middle. It didn't have the big upfront design...but it didn't have the proper agile procedures in place to support that...because the requirements were not clear. We weren't sure exactly what the client wanted or how they wanted to go about doing things.*

The vendor involved in this project was determinedly informal and non-bureaucratic, but in this instance the approach appears to have been taken to an extreme. In the latter stages of the project, the PM was reassigned to another task and the project was left to proceed to a conclusion without any hands-on leadership. This is clearly a high risk approach, and the resultant customer satisfaction level appears to have been low.

Another project (number 24) that definitely suffered from a lack of governance, involved two large multinational organizations as sponsor and vendor, and it is remarkable that two such renowned companies should have been responsible for such a laissez-faire approach. The interviewee made this comment about the regime under which he was working:

> *Looking at it in terms of how you might approach a project as regards structure and documentation, I didn't see strong evidence of an effective project methodology being used. Looking at the documentation, it clearly didn't follow the [sponsoring organization's] methodology, either IS or corporate. The documents that I saw didn't seem to me to fit within any known project methodology.*

Again, the absence of clear governance seemed to have a detrimental impact on the project: the system fell considerably short of expectations on the customer side.

6.3.2 Project Methodologies

A number of organizations, both sponsor and vendor, subscribed to the use of particular project methodologies. As might be expected, the larger vendor organizations were proponents of formal documented project methodologies, as were some of the larger sponsors. The regime most frequently mentioned was the Project Management Body of Knowledge (PMBOK) method, which is an internationally recognised standard. This is an extremely comprehensive set of routines that cover every aspect of project management. In practice it appears that the PMBOK principles are not adopted 100%, but are used more as a toolkit from which the leadership selects those techniques that suit the particular situation.

Government bodies, both federal and state, frequently subscribe to the use of the PRINCE-2 project management standard. One of the larger vendors observed that they had been able to develop a PRINCE-2 adaption that operated under the PMBOK umbrella, so that they could satisfy both the client's requirements and their own internal reporting processes. Project 6 involved a federal government department; however the project manager on the vendor side was not impressed by their understanding of the principles of PRINCE-2:

> *They were not interested in any techniques that I used...because they are meant to be tied to Prince-2 methodology, and so there was nothing for them to learn. Because they have already learned that and they work within that framework. But in practical terms they couldn't even spell it. Other projects that I have run, the project has been ticked off against Prince-2 deliverable type structures...which means that you can't start one phase without completing the previous phase, and all that sort of stuff. But this one didn't rely on that.*

One project involved three large organizations, each with its own understanding about how best to initiate and operate a major undertaking; the leadership of Project 22 were initially faced with reconciling these differing opinions and objectives. They compromised by selecting a hybrid solution based on processes from all three organizations:

> *[The other sponsor] use Six Sigma, or whatever they call it, and we used quite a lot of those processes. But the basic project management methodologies we just developed between us. We had good practices on both sides, we had good consultants, and we had the [vendor] processes. We just put together a set of methodologies that worked for us.*

6.3.3 Project Management

The governance structure is quite distinct from the practice of managing the project undertaking. One of the most experienced and senior of my respondents (Project 14) declared: "To me project management is not about processes and documents, it's about how you deal with issues and the level at which you manage, and that's the bit that changes depending on the project". This is an acknowledgement that projects are always different, and while the governance structure may guide the venture, there is a constant need for the leadership to recognise and address problems that may impede or jeopardize the progress. The research process provided a great deal of insight into management qualities and practices.

Perhaps the most frequently mentioned (or apparent) attribute of the project leadership was their impressive level of experience within the profession. Six of the non-leadership interviewees made either specific, or strongly implied, assertions that the project managers to whom they reported were experienced and effective. This comment from a business analyst working in Project 4 indicates the level of respect that she held for her leadership:

> *The [vendor] project leader had coordinated some very large projects. He was very capable, and very knowledgeable on project management, and managing developers. I mention that specifically, because managing developers is painful. The deployment manager had previously managed the implementation of the SOE within the organization, and she knew the IT production side very well. And the program manager was a true project professional. He worked to the plan, and he worked to the numbers.*

Where the particular interviewee was a member of the leadership team, it is more difficult to make a judgment about his or her management capabilities and effectiveness. In four instances a senior person was interviewed, and based upon the successful project outcome and other indications, it became clear that the participant was an experienced practitioner. The vendor project leader in number 17 recounted this plaudit after an 18 month implementation at a government department:

> *At the end of the day I think [the customer] probably realised that we had done a damn good job. While I was away I e-mailed back to them, and asked, what version are you running on now? And they replied and said we have classed this as one of the best implementations we have ever had. Whether we'll ever get that in writing from the client I don't know. In the end it all went pretty smoothly.*

In another example, the leader of Project 16 delivered a successful result for a client with remarkably little involvement from his own (vendor) management with whom he had only infrequent contact. The vendor runs multiple projects simultaneously, and my interviewee gives the impression of being not only competent but also sufficiently trusted to be left largely to his own devices, as he commented below:

> *I personally set my own standards. I work not because somebody tells me what to do and how to do it; I work because I take pride in what I do. That's my motivation. I don't have too much interaction with [the owner of the vendor company]. I talk to him from time to time...in terms of the project I will only ask him if there is something I'm not sure about and I know he's been involved. He leaves me to my own devices, which is nice.*

Seven of the projects made particular mention of the project leadership being "strict" or used words implying "uncompromising" and it would seem that this is a fairly frequently encountered characteristic. This is by no means unexpected, because projects require strong direction if they are to meet their objectives, and naturally some leaders would place more emphasis on firmness rather than relying on personal charisma. One example of tough decisions being made was in Project 17; this was notably complex, with multiple teams and very demanding timelines. The vendor programme director made his position clear at the launch meeting:

> *That was the idea in the kickoff meeting where we brought in all the senior vendor people, and all the business people. The idea was that this was not a "you deliver it and we'll use it" situation, it was a situation that we had a program to deliver, and everybody needed to be on the same page. And people who were not on the same page were removed...you know, the obstructionists. Or they were counselled...I am ex-military and I just do what needs to be done.*

The staff turnover on this project was substantial, and this one vendor used over 100 people during its 18 month life-cycle; how many people were "removed" was not made clear.

There were two cases where there appeared to be a conspicuous lack of leadership experience that ultimately adversely affected the end result. Project 15 appeared to suffer from an absence of planning and direction, and in Project 24 the interviewee was not impressed by the manager's lack of understanding of the project objectives:

> *Considering the suitability of a project manager for a project like this...I think that there is a risk when you put in someone that technically may not understand the system, both from an application perspective and how it*

works in relation to meeting business needs. I think there is quite a high risk in doing that.

Whilst a technical grasp of the system may not be an essential management attribute, it is clearly a leadership deficiency to leave such an important knowledge gap unfilled. In both these projects the results were unsatisfactory.

6.3.4 Building Team Relationships

Half of the respondents (12 out of 24) made reference to particular efforts to build team relationships by means of informal gatherings. This was obviously perceived as sufficiently important to feature quite prominently in the practice of several of the projects, including several of the large assignments. Project 7 was notable as a very long duration and high-stress undertaking, and this was one of the ways that the pressure was eased and interaction across the four teams was encouraged:

We used to have monthly drinks. There were people from four different organizations. We did very much themed things so that you got to know people as people. So it broke down those barriers. For example, we all brought in baby pictures and you had to guess who it was. So, we stopped thinking about people representing this company or that company and thought about them as people.

In the case of the smaller projects, the project manager could afford to engage more closely with the team, as exemplified in Project 5:

I think that the interaction between the team members was fairly informal. I always like a little bit of personal information about the people I'm working with...it just means that occasionally you can pop out for a coffee. You can clear your mind and have a bit of relaxation for 10 or 15 minutes. But we always made a big deal of somebody's birthday, or when things were particularly heavy going for a couple of weeks, we'd make time to go out for lunch and chill out for an hour or so.

These circuit-breakers were not always entirely welcome, if it was felt that they consumed too much valuable time. The Director of Project 17, representing the major vendor, had a very demanding schedule and found the regular social events to be a little distracting:

We had the Ministry of Fun, which actually became a pain in the neck...it was run out of the business team, and every week they would send out a quiz or pictures of the project. I actually thought it was too often. You could see that the busy people were not doing it, and there were other people actively involved who shouldn't really have had the time. They were the ones with the critical deliverables, but they still had time to do the Ministry of Fun.

At the other end of the scale, Project 24 disdained all efforts at team-building and social interaction and left the team members to work largely in isolation. This did lead to a feeling of resentment on the part of the respondent:

> *I think that the level of commitment that was provided by project team members went way beyond what could reasonably be expected. I think there was a very poor commitment to providing any form of time-out during the project. There were no lunches, evenings out, not even just a one-hour break now and again, none at all that I could see.*

It seems to be a recognised part of project practice to engage in team building, and it is an important element in the creation of an open sharing environment in which learning can flourish. Those projects in which the creation of a socially cohesive team was not specifically mentioned should not be perceived as a firm indicator that such steps were absent, and may have been more a sign that such activities had been subsumed by other priorities. For example, Projects 6, 10 and 14 were notably troubled and the participants were more concerned with discussing problems and rescue strategies. Two of the smaller projects, numbers 2 and 11, did not refer to any team building activities and this was probably a reflection on the smaller size of these teams and the fact that they were co-located, suggesting that specific attention to this was unwarranted. In other instances, such as Projects numbers 1, 18 and 22 the workload was clearly very sustained and intense, and these primary aspects tended to feature more strongly in the interview situation than any reference to team bonding or social activities.

6.3.5 The Importance of Planning

No fewer than 17 of my respondents (70%) made either specific or implied reference to the planning activity that was a significant part of the project process. The level and depth of the planning varied widely, and it seemed to be based on two variables: the nature of the project and the relative experience of the project leadership.

Projects concerned primarily with the delivery of infrastructure (type 1 projects, using Turner's theory described in section 4.3.2) were subject to intensive initial planning, as was particularly exemplified by Project 11. This project was meticulously prepared and executed: for instance, this is how the network cabling was organized:

> *It was a long project, really long. It was extremely well prepared. We had lots of meetings. We visited the new building. ..I knew everything about the new space quite a long time before we moved. Everything went really smoothly. I write everything as a graph, very mathematical and precise.*

> *When we started to work together, the cabling contractor was continuously confused, but I trained him to understand my diagrams. And that way there is no possibility of misunderstanding, you have to concentrate when you read them but that way everything is very clear. So that went quite well.*

Project 6 was concerned primarily with infrastructure, but the vendor's blueprint was sabotaged by the customer's negligence in endorsing the plan, and the project suffered seriously as a consequence. No matter how well established the procedures, nor how careful the preparation, unless all stakeholders subscribe to the plan the project will become distressed.

Those projects with substantial unknowns such as numbers 15, 19 and 20 were planned much less rigorously than those that were more predictable. Project 19 was deliberately developed using an agile methodology because it was breaking new ground, and flexibility was more appropriate than attempting to work to a rigid plan (Loch et al. 2006). As observed by my interviewee (the project manager):

> *...one of the problems with the project was that we had bought an external solution. We were working with external people and there were a lot of unknowns. So it was a bit hard to plan, and a bit hard to define roles. So everybody rolled up their sleeves and did whatever they had to do. There was no problem with that, everybody was happy to do that...there were a couple of times when people became a bit stressed. Mainly because there were a few unknowns there, we didn't have all the answers all the time. But we stuck it out and eventually the pieces fell into place, and the project was a success and everybody was happy.*

This project manager made many references to his role being very challenging and very stressful, and no doubt the uncertainty of operating in a relatively unplanned situation was a contributor to this. However, the manager seems to have been equal to the mission and guided the team to success. By contrast, Project 15 appears to have attempted to operate to a minimum-plan model when the leadership did not have the skills or experience to operate in this way. The interviewee made this comment:

> *We didn't want to use the traditional approach; we were trying to steer well away from that. But we were not ready to embrace the whole agile approach properly. Part of that might have been not fully understanding the whole process and what is required in the agile process...and what you have to do to make the agile process work.*

The dynamic plan that is updated as the venture progresses is legitimate in the context of an innovative or ground-breaking project, provided that the leadership understands the discipline that is required (Loch et al. 2006): this discipline appeared to be absent

from Project 15 and the focus of the venture was lost resulting in a late and unsatisfactory delivery.

Project 20 concerned the enablement of business processes in an offshore environment, and sat squarely in the Type 4 quadrant, being innovative in terms of both objectives and methods. This project has been "extraordinarily successful", and the leadership and the team seem to have thrived in the comparatively unplanned environment. The enablers for this appear to be an inspirational leader, with a team of experienced specialists reporting to him, and a very flat reporting structure. My interviewee observed:

> *[The project manager] has developed a very dynamic and successful team, and I hear from others who have worked with him on other projects that he has the talent and the ability to do that. There is a certain level of dynamism to this whole project, and there is a need to be flexible at all times and in all circumstances. In the project space, both on the business and IT side, some people were extraordinarily dedicated to the project, and I think they deserve a lot of credit.*

The key to operating successfully in the dynamic agile setting is to understand the discipline and the stress that it imposes, and to address it with an apposite level of dedication. There is also a suggestion that experience and maturity are valuable contributing factors when functioning with this approach.

6.3.6 Communications

The majority of the respondents (19 out of 24, or 80%) made particular reference to the importance of internal project communications, both within the project team itself and between the various vendor groups. However, recognition of its importance did not always translate into totally effective interchange of information. Only 12 of the projects (50%) appear to have enjoyed communications that were fully (or mostly) appropriate to their situation.

There were certainly cases where projects suffered from a surfeit of communications. The technical developer from Project 13 complained of daily project meetings that were not well controlled and wasted his time. Likewise, the project director of Project 17, representing the vendor, found himself obliged to attend daily meetings with his clients:

> *We started having daily update meetings where we brought up a lot of these issues. They turned into a great long talkfest. They got everybody into the room every day. It was probably an overhead we didn't really need, three*

days a week would have been enough. We found that the same subjects kept coming up again and again, because there wasn't enough time between meetings. The status was often the same as yesterday.

There is clearly a considerable skill involved in balancing project communications, which takes into account the need to exchange information, the need to provide people with an outlet, the relative pressure of the situation, and the amount of time that participants have available.

The manager of Project 18 found himself needing to hold regular discussions with another vendor on the same project, and there was initially considerable competitive suspicion between the parties. The project operated under substantial stress and there was much exchange of blame and retention of secrets. The meetings started more as exercises in "tactical positioning" rather than free-flowing exchanges; however a degree of trust and acceptance was established later as the project matured and the pressure of delivery increased. The troubled Project 24 suffered from a communication vacuum. The interviewee was largely left alone to run the test programme, and felt considerable resentment towards the leadership that failed to support him:

Meetings weren't run very regularly. They were quite commonly cancelled because of non-availability of people, or they were run with a smaller core group. While I was on the project [six months] I didn't attend more than one or two. Probably there was not that ongoing review being done. There were issue boards being maintained, but I didn't feel they were being very effectively managed. A lot of the visibility on issues was carried out by verbal dialogue. One of the problems I had was access to the project managers, which was quite poor because of their heavy commitment to other meetings. It was very difficult to get a lot of time with them to discuss issues. With a lot of the issues, you found you were self-managing.

The failure to engage the test manager in a constructive and inclusive way subsequently harmed the next phase of the project because he declined to continue in his role, and his knowledge and learnings were lost.

Project 22 was a very complex project involving the synchronisation of the activities of two large project teams, one based in Sydney and the other in Melbourne. The project leadership was very experienced and recognised from the outset that efficient communications would be paramount. Tele-conferencing was used extensively, and the project leadership insisted on full attendance and timely dial-in.

We tried video-conferencing, but it didn't really work. Tele-conferencing worked for us like a dream. It was very effective. But you have to make

sure people attend meetings on time. We found that people are far more respectful of a tele-conference than they are of a standard meeting in a boardroom.

Apart from the regular tele-conferences, the project had a regular steering committee at which personal attendance was mandatory, and the governance was enforced by a level of trust and commitment at the senior level:

The project had very, very good communications. We got on very well at the top level as managers, because of the governance structure. We solved lots of problems by picking up the phone to your counterpart, and saying: we've got a problem, I am going to do this on my side, can you do something on your side? At the end of the day, it worked out.

This project was notable for its size and complexity, the level of experience and professionalism within the leadership, and its ultimate successful outcome. It is interesting that so much emphasis was placed on communications, and that the leadership recognised from the outset its importance to project success.

There is also a certain pattern to those five interviewees that did not make any specific reference to communications. In three cases the projects were managed and run in-house by the organization, in which case adequate communications were perhaps a given, and no special provision needed to be made. In the other two cases, Projects 6 and 10 were especially troubled, and lack of effective communications appears to have been a contributing factor. These two projects have been discussed in more detail in the section on fixed price agreements.

Overseas Communications

A number of the projects had an offshore component, that is, part of the project was undertaken overseas while management of the project remained onshore. Three of the project participants made mention that communication with the offshore teams presented some complications. In the case of Project 16 the team was dispersed across Australia and Singapore, with part of the system development being undertaken in the Ukraine. The Singapore team did not present any communication issues because the time difference was minimal and there were no language difficulties; however managing the development team in Kiev raised complications with both time difference and language. The project manager observed that:

It was difficult working remotely...when you are sitting next to somebody, and they have a question, you can explain it to them. You can see the body

language and the interaction and so on. When you have to explain to someone who has not got a background in the [specialist application] field and they are in a different time zone...you have to explain it by e-mail and it becomes quite difficult. So I tended to give work to him that required a lesser level of knowledge...just to make the transfer of information less of a strain.

Project 23 involved the offshore development of a major financial system, with the project extending over 3-4 years. The respondent advised that their regular conference calls with India were less than totally satisfactory because of voice quality, but the time difference was reasonable: "India has the advantage of not being that different timewise. If we had been dealing with the USA it would have been diabolical!" In this instance there was considerable interchange of project personnel between the two countries, with key people spending up to three months on their foreign site to ensure effective knowledge transfer, so the difficulties with conference calls were largely circumvented.

An example where time zones presented real difficulties was found in Project 24. The interviewee was responsible for a major testing exercise of a corporate application, and was required to provide each evening a verbal account of the day's progress. The conference call needed to be made to meet UK business hours, at around 8pm each evening. Additionally, regular calls needed to be made to the development team in Spain, which consumed further time each evening. During the six months duration of the project, the interviewee was required to work between 12 and 16 hours per day to meet the requirements of the offshore teams and he found it a most exhausting and demotivating experience.

6.3.7 Project Location

One third of the interviewees (8 out of 24) made specific reference to the location of the project team, and in the majority of those cases co-location of the team was mentioned as actively assisting the dynamics and communication, and ultimately the outcome. Five projects reported how co-location enabled good interchange of discussion and ideas: this is also very conducive to situated learning as previously considered (Constantine 1995). Project 19 started its life dispersed across several locations, and the project manager initiated daily starter meetings to enable the dialogue process to function. When the team was subsequently co-located under pressure from the PM, the meetings were so well entrenched that the team elected to continue with them regardless.

However, Project 21 had the opposite experience. The team was located alongside their business stakeholders, the marketing department, in order to facilitate constructive dialogue with the system sponsors. However this was found to be counter-productive later in the life cycle:

> *At one stage we moved everybody away from the marketing team, and I didn't tell them where they had gone. I wanted to stop the marketing people going to them and interrupting them. Because marketing had no concept of the requirements process, they would just walk up to the developers and ask them to change something. And it may not have been approved functionality or expenditure.*

This was a good example of the seasoned project manager identifying a hindrance to the project and acting in an uncompromising way to eliminate it.

However, it would seem that free and open communication only flourishes if the team members allow it or want it. The problematic Project 14 was a mixed client and vendor team occupying a single location, but there is a strong perception by the client team that they have been failed by the vendor's limitations and this has hampered the building of any rapport. As observed by the interviewee: "the ongoing disputes and the communication issues with the vendor have obviously caused problems in terms of relationship and trust...and this is quite understandable".

6.4 Project / Business Relationships

In all information technology projects, "the business" is invariably the driving force. The business is the sponsoring organization that funds, directs, and is the raison d'être for the project. The relationship between the business and the project can be complex and multi-faceted, and varies greatly in each situational context. This relationship and its effect on the project formed an important part of my research. Interestingly, there was an expectation that this section would be much concerned with dealing with "organizational politics". Sense (2007) and Wenger (1998) both expressed the view that coping with internal politics was a significant overhead that required astuteness and vigilance.

However, this proved not entirely to be the case; the expression "politics" was mentioned only by four respondents once each in all my research material (which totalled over 120,000 words), and then not in an especially derogatory sense. It may be that the discussion around relationships, which was extensive, effectively covered the

subject in sufficient detail that most respondents did not feel the need to discuss "politics" separately. The term "politics" is somewhat nebulous and includes such relational factors as non-cooperation, deliberate obstruction, cells of resistance and protection of power bases. These themes are discussed in their context in the following sections.

6.4.1 Empowerment

One of the keys to project success is undoubtedly to be found in the commitment of the organizational leadership to ensuring the timely contribution of all business stakeholders. There are a number of ways in which this is manifested: by the presence of a champion who forms an interface to the business; by providing the project leadership with a powerful and unchallengeable proxy; or by the active and ongoing personal involvement of a business leader. Nearly half of all interviewees (11 out of 24) made reference to their project having been empowered in some way as a means to leverage progress.

Project 1 was a reprise of an earlier venture that had languished for nearly two years without achieving any useful result. According to my respondent the management failed to adequately empower the original project manager: "they didn't give him any resources, they did not give him any budget, and they did not give him any direction as to which paths he was or wasn't allowed to take to achieve the objective". Eventually the issue came to the attention of the CEO, who realised that the matter needed urgent action. An untarnished leader (my respondent) was appointed and the project urgency was escalated:

> *It became high-profile, at the CEO level. That's why it got the sudden rocket attached to it that it did. And then from that moment on the CEO got involved, and he sent out a global e-mail stating "The project is going to happen, [interviewee] is doing it. I expect all team leaders to offer support to him". That was the driver. Having said that, it was on my suggestion that the e-mail was sent out - because I knew that I was going to face the same fate as my predecessor if I didn't do that.*

It was significant that the project leader himself suggested that the proclamatory e-mail should be circulated. He had observed the failure of management to support the previous leadership, and was determined that there should be no recurrence. The incoming leader reported weekly to the CEO, and by this means he was able to leverage

his support structure to ensure that resources were made available, pockets of resistance were effectively countered, and ultimately a satisfactory result was delivered.

Project 2 also enjoyed high-end support, in this instance from the managing director, who was also the proprietor of the business. Again the project had been attempted before, with disappointing results, and the MD made a decision to address it with his own personal commitment, as described by my interviewee:

> *It was governed in a competent way in the financial sense, and the managing director was effectively running it. He had control, and nobody was going to argue with him. Any resource problems or any conflict about needs or priorities, he was able to get on top of and sort out very quickly.*

There is an interesting contrast between these two projects: in the first one, the CEO delivered an edict and then delegated the power, in the second the MD assumed leadership of the enterprise and remained a committed presence until the conclusion. Both approaches delivered a successful result: but we must consider the difference in scale of the two organizations. The first was at least an order of magnitude larger than the second, and in an organization of its size it would be unusual for the CEO to assume an active leadership role.

A potentially very testing exercise was the implementation of the AS27001 Information Security Management standard within a government department, as recounted by interviewee number 5. There were initial concerns about the counter-cultural nature of this assignment and the strong likelihood of encountering cells of resistance within the deeply entrenched hierarchies. The CIO was operating under a powerful mandate from the state premier's department, and was not prepared to tolerate opposition; he made the position clear at the commencement, and thereafter provided a high level of support to the project leader, as she recounted:

> *Once the key stakeholders had accepted that the project was going to go ahead, with or without their help, and in order for them to have some control over their area of responsibility, it was really in their best interest to be involved in the project. There was very little resistance, and the hierarchy didn't pose a problem. Actually it was the guy at the top [the CIO], who said: "you are all going to do this".*

The support of the CIO was invaluable in providing leverage, but the PM also required considerable personal skill and persuasive powers to coordinate the different silos and personalities that were disinclined to disturb the status quo. Ultimately a good result

was achieved: "we got buy-in, and we got involvement, and we got all the stakeholders believing that the security management system was benefiting them".

6.4.2 Project Champions

A number of projects reported that an effective way to work within a hierarchical structure was to have a powerful champion from the business side to facilitate stakeholder engagement. This had the effect of bypassing the (possibly resistant) organizational culture, opening doors and facilitating cooperation. Both Projects 7 and 8 had (at least nominally) similar backgrounds in that they were repeat projects and both organizations produced champions who were motivated to navigate around the obstacles and drive the ventures towards the right conclusion.

Respondent number 7 recognised the contribution of their champion and his inside knowledge of the business:

> *We were doing something that went across, from a process point of view, from the customer up front all the way through to call centres and across departments who were potentially impacted. It was very good to have somebody who could help us to identify who those stakeholders were, who knew the organization, and could get those people into the workshops.*

A champion also emerged within Project 8, although a dissimilar organization in a different industry sector. Again, there was a suggestion that management were determined not to entertain another failure, as my interviewee commented:

> *The first couple of times they tried it, they probably thought why are we doing this? They did have one guy who said, this time this project will work, I will make it work. He put it all in, and then he left. He was an employee, and very senior. He was very motivated, and the main instigator.*

Both interviewees made mention of the particular motivation of their respective champion; presumably an active and energetic individual enhances the experience. Interestingly, the instigator in Project 8 moved on after the system was implemented; this is mentioned again in the next chapter.

By contrast, Project 17 had a business interface individual appointed by the sponsoring organization, but he barely qualified for the designation of champion; he failed to work to the agreed schedule, and was more hindrance than help. This led to a series of events that ultimately produced results, but only with some damage to the relationship, as noted by the interviewee:

They had a business guy running the business side who didn't understand about scheduling and we never knew when we were going to get anything. So the project director asked us if we had a business project manager to sit next to him and coach him. So we did that. Unfortunately the guy we put in had previously worked for [the sponsor], and he was as laid-back as the rest of them. But that worked to a certain extent and he did get them a bit organized...but when it came to the implementation phase we had to move him out. So we had to put someone else in. So I put a terrier in there, and she went round biting their heels. She got results, but they didn't like it...and the business complained.

It is interesting that the "appointed" business contact was far less esteemed and effective than the self-motivated individuals who championed the two projects mentioned earlier in this section.

6.4.3 The Entrepreneurial Approach

An alternative approach to empowerment was adopted within Project 4; this concerned the progressive implementation of a global help desk for a very old-established international shipping company. The sponsor company was very traditionally organized and there was an initial realisation that obtaining the necessary level of engagement and commitment from the worldwide stakeholders could be problematic; the solution adopted was to create a separate service company so that the project had its own autonomous presence and became financially accountable. This approach created an entrepreneurial spirit that had the desired effect of motivating the project leadership into facilitating stakeholder commitment. Regrettably the sponsoring company was acquired by a competitor, and despite the project's encouraging progress and advanced state of maturity, it was cancelled.

6.4.4 Aligning IT with Business

The project described by interviewee 23 was another example where the business leader led the venture from the front. Within this organization, information technology is not a central service function (which my research suggests is more frequently the case), but each business unit employs its own closely aligned IT specialists. The leader decided that all his business-critical systems required updating, and launched a very ambitious project to achieve this. The IT specialists did not drive the venture, but were required to participate to the fullest extent. My interviewee commented: "The business leader...I don't know whether you would call him charismatic...he had a bit of force to his vision. You had to go along with the vision". There was no concept of, or need for, a

business/technology interface: there was a single project team that drove the endeavour. Importantly, there was a perception of joint responsibility when the project exceeded its budget, as the respondent observed: "the business saw itself as part of the process. They got upset, but when costs ran over they were so immersed in it themselves they were not too quick to judge. They knew what was going on".

Project 22 was an extremely high-profile high-cost project brought about by the transfer of an entire business unit from one corporation to another, involving the re-engineering of both infrastructure and application systems. There was a sense imparted by the interviewee that this venture would simply not be allowed to fail by either of the two sponsoring organizations: "this was a business transaction and not just an IT transaction, and it was reporting up to the board levels on both sides. It had very high visibility and that helped the success of the project". The receiving organization funded the undertaking, and their business leadership needed to maintain a high level of commitment in order to ensure the acquired business was smoothly integrated. This responsibility was duly accepted, and finally the transfer was completed successfully. The interviewee considered that the high level of business involvement was a crucial element of the result:

> *The real success story was that [the new owner] closely linked in their business. Every migration stream, every office environment, had its business leader who was a significant person within the local organization. They dictated when things were done, how they were done, formally signed off all the requirements, signed off all the status reports and all the traffic lights. They were, from a business point of view, plugged in the whole time.*

It is noteworthy that the project had a two-year lifespan and both the business and the project team maintained their dedication for the duration.

6.4.5 Building Trust

Within six of the project interviews there was a specific expression of a level of trust that the business held in the project community, and commensurate with that, an implied conferring of power and authority. Project 11 concerned a firm that had a requirement both to move premises and concurrently install a major infrastructure upgrade. The project manager had a long history of providing consulting to the firm, and was well known to the principals. The PM originally was reluctant to take on the role because of other commitments, but the firm persuaded him because they felt he was the one person they knew that they could entrust with the complexity of the task. The

level of IT knowledge within the firm appears to have been fairly limited, and the principals wanted a professional who could take ownership of the undertaking and allow them to withdraw. They furnished him with ample funding and a moderately broad scope of work, as he commented: "I had sufficient budget and resources to achieve everything…they gave me a pretty free hand… they were prepared to spend more than we actually spent". The trust in the individual was well-placed, and the outcome was delivered successfully. In this instance the endeavour was predominantly based on technological and physical change, and, provided that an appropriate agent could be appointed, it was practicable for the firm to transfer control. This was perhaps the only true Type 1 project (Turner 1999) within my research body, in that both methods and goals were able to be clearly defined, and the results were readily measurable.

The circumstances around Project 12 were very different, involving the in-house development of an application system. My respondent is a very experienced systems architect, with a long history within the organization, and believes that he is regarded with a high level of trust. He is well known to his business constituency and has developed a strong rapport with his stakeholders:

> *We have a very good relationship. Mainly because I been here so long and I've worked with the business for a lot of that period, that's 13 or 15 years. And there are people in the business who have the same length of service so we have established a very good relationship over that time. I think they value what knowledge we have of the business and they respect our decisions when it comes to matters of IT, and they know we have their interests at heart.*

The same organization makes extensive use of service providers and contractors, and my respondent was one of a small cohort of long-serving permanent staff; I believe that there is a (possibly unconscious) message in the last sentence, suggesting that he felt himself to be a more trustworthy source than other IT specialists with whom they have contact.

An example of a highly trusted vendor project manager was found in Project 16. The PM had a long track record of successful delivery for his vendor organization, and was left largely alone to organize and operate his project. He was not managed from above and produced only three or four reports to his stakeholders over 18 months. The vendor organization operates multiple projects concurrently, and the culture is not to monitor closely, but to depend on project leaders reporting only by exception. This was done, as

he explained: "if I had any problems, needed more staff, not going to make a deadline, I need help, I told them straight away". Apart from that, reporting was kept to a minimum. For this organization and this project the minimalist approach was effective and the trust was justified, and the outcome was "absolutely successful…we were ready on time".

The leader of Project 19 made repeated reference to the importance of building and maintaining relationships with his business stakeholders. The organization is relatively unstructured and depends upon individuals and teams developing their own trusted connections and power base in order to achieve their objectives. The respondent made his mission the growth of his relationships in all areas of the business, as he recounted:

> *You ask what contributed to the success…relationships were important. The way this organization is structured there is not a lot of hierarchy, and not a lot of processes. There is not a lot of management support, but there are great expectations. The way that projects are done here is by influencing, by having relationships. I've got a lot of very good relationships here, some of the major stakeholders, and the sponsors. Also with other people like operations, that you need help from now and again. I've got relationships everywhere in this organization, and that has helped a lot.*

The PM clearly understood the way that the business operated and how to achieve his goal, and used his relationships and the associated power that they provided very effectively, and although he found the assignment particularly stressful, he commented: "it met its business objectives and it's a good feeling. It's been a big tick for me, I guess".

Project 20 was a prolonged programme of work concerning the progressive delivery of business services to an offshore provider. This was a ground-breaking undertaking and commenced with a fairly discreet pilot exercise. The early results showed great promise and the project was expanded in scope, with increased targets and extra resourcing. The interviewee held the opinion that much of the continuing success of the venture was due to the effective way in which the team engaged the business; a standard of engagement that had not been achieved before, as he observed:

> *That forced our team, which was a buffer to the IT organization, to work very hard to make sure those service levels were met in ways that were measurable. On the IT side they had to change quite a bit. On the business side…there was a need for them to clearly elucidate their requirements, and also to learn a bit more about IT instead of making assumptions. They also learned that if they could describe [to us] in detail what they wanted, it*

normally could be delivered. There had been a real failure of those two sides of the organization to speak a language that was similar.

As the programme progressed, the status of the project team became continually enhanced, and its presence and power base grew accordingly. When the sponsoring organization was taken over by a much larger competitor, the bigger company was sufficiently impressed by the project not only to retain it, but even to expand its scope within the new group, as my respondent recounted:

We are one of the only parts of the IT organization that survived the merger. We are overwhelmingly contractors in our team, and we were just about the only ones...hundreds and hundreds of contractors were shown the door at the time of the merger...and there never seemed to be any risk to our team. Similarly we found ourselves as one of the only teams that has, in the merger space, maintained its level or even ascended in the new organization.

The fate of this project is in marked contrast to Project 4, where the sponsoring organization was also the subject of a takeover. In this instance the business case appears to be based upon solid financial economies that were irresistible to the new owners.

6.4.6 Relationship Management

A number of projects encountered difficulties in their relationships that presented challenges that were addressed with varying degrees of success. Project 3 was a complex and long-running project, with an ultimately favourable outcome, but it encountered one substantial roadblock, as recounted by the interviewee:

[One of the subsidiaries] operates in South Australia. It's a very parochial market. There is some really stupid functionality in the system that really doesn't need to be there, but they dug in their heels and insisted that it be included. The [subsidiary] insisted on the inclusion of functionality where the business benefit was really not clear. They were the only difficult people in the bank.

The failure of the project team to negotiate this resistance more effectively resulted in significant extra functionality, and a considerable overhead on the final system. However it may be that the additional features assisted the acceptance of the system in South Australia, and thereby supported the change process; there may be a trade-off between accepting an added developmental burden versus reducing the effort in the change programme.

Project 6 suffered ongoing vendor/client relationship problems throughout its lifespan. The business contacts with whom the vendor was dealing were all short-term contractors who were unconcerned about building a quality relationship. The vendor project manager was accustomed to building ongoing professional relationships, but in this instance his efforts were fruitless, as he explained:

> *With a full-time employee, they know that decisions that they make will affect them for many years to come. These blokes know that they will be moving on to another contract that is nothing to do with this one. They're not worried about making the process repeatable, or contract extensions. They are there to represent the Commonwealth and get the most out of this one job. Ongoing business relationships don't matter at all. A full-time employee will get benefits out of building a business relationship, but these blokes will not.*

The vendor also complained that the client provided him with multiple stakeholder contacts that regularly provided contradictory information, which was a source of major frustration and unfunded further expense. The failure to nominate clearly those stakeholders with input rights leads consistently to the gathering of conflicting information, and ultimately project delay. The same problem was reported by three other projects, so this is obviously a recurring issue that should be given serious consideration. Project 15 had two major stakeholders in Sydney and Melbourne and they frequently contradicted each other with adverse effects on the development process. Similarly with Project 11, the Sydney and Melbourne offices failed to agree on a consistent approach which resulted in the Melbourne office being obliged to accept an outcome that was different from expectations. Project 21 had a very immature stakeholder group that regularly provided conflicting input; fortunately this was identified early by the project leadership, and they only recognised decisions handed down by the General Manager. As the respondent commented: "we started to get efficient once we realised the culture".

There appears to have been an instance of misplaced or excessive trust within Project 15. The system was developed by the vendor for a client, who had formerly been a colleague, as described by the interviewee:

> *This relationship was fairly unique, because the client is a guy that we used to work with. So we know him as a colleague and as a friend, and now as a client. So the communication is a lot more open than it might be with a regular client.*

Unfortunately the open communication and informal relationship appear to have caused the project to be approached in a way that may have been excessively relaxed: the requirements were never properly specified and the system was delivered very late and required substantial rework. This clearly demonstrates the risk of undervaluing the maintenance of the client relationship; those that commence with a very high level of trust may lead to a complacency that could ultimately damage the association.

Project 24 was an interesting case, in which it appears that there was a complete underestimation of the need to engage the business effectively. Not only was the business inadequately consulted, but the project was under-resourced, and the system implemented in great haste. The business was presented with a "vanilla" version of the application and expected to work with it, as the respondent observed:

> *What ended up happening was that the business had to accept a lot of standard functionality within [the application] that possibly didn't entirely meet their business needs. With the poor level of business engagement, a lot of change requests that should have been included at the beginning, were not properly identified. A lot of those have had to be carried over into the next version of the system. Some departments using the system have ended up getting a vanilla standard version that probably means their business processes will have to adapt to that initially.*

The source of the problem in this case seemed to be that the Australian organization was installing a global application that was already in use in many other subsidiaries. There was a tacit expectation that the system was already sufficiently customised to be locally acceptable and useable; unfortunately local practices were largely ignored. The pain that the organization suffered as a result demonstrated that these assumptions were flawed.

6.5 The One.Tel Case

The material gathered from the interview conducted with the One.Tel respondent was unique amongst the research contributions, and has been analysed in isolation. It was interesting that the One.Tel interview, although relating to events of eight years previously, was the longest of all transcripts at over 6,000 words. The respondent observed that it was one of his more interesting and memorable working assignments, if not professionally rewarding.

6.5.1 The Background

The One.Tel company prided itself on its openness and team nurturing qualities, as evidenced in the following extract published in the company's final annual report:

> *One.Tel has been built on the foundations of a flat non-bureaucratic organizational structure. Teamwork and information sharing enhance the flow of information as we all strive to build our business together...employees continue to benefit from the One.Tel beliefs and values that enable cross-training, sharing of skills, and learning... (One.Tel Limited: Annual Report 2000)*

The same report made particular mention of the Billing system which it claimed was "scalable and flexible, which results in lower costs and allows us to react quickly to market forces". The information provided by my respondent, a member of the Billing programming team, completely contradicted the official published account, and the statements in the report are indicative of the delusional world that One.Tel seemed to occupy in its final stages.

The company certainly appeared to understand the attributes of the learning organization and made genuine attempts to implement them. The concept of cross-training and skill-sharing was undoubtedly practiced, and the company had a propensity to promote long-serving employees, who were well-versed in One.Tel practices, into senior roles. The rationale for this was to enable the experienced people to propagate their enthusiasm for the One.Tel business style across to the newer recruits; however this could result in some long-term staff members being promoted into roles for which they were barely qualified. The company acquired a rich culture during its brief lifespan of six years, with its own special lexicon, determined espousal of the team ethos, and open-plan brightly-painted offices. This deliberate anti-bureaucratic positioning was a major differentiator from its principal competitors in the telecommunications marketplace, who were derided as outmoded purveyors of traditional technology along copper wires (Barry 2002). The social structure thus developed became far more than a reflection of Jodee Rich's personal concept of how to operate a business; it engendered a loyalty between the long-term employees and the company that was almost familial.

The implementation of a genuine learning environment with knowledge-sharing and free and open communication is fundamental to the development of an organization that is flexible, forward-looking and innovative (Senge 2006). In its early years of rapid

growth, the One.Tel business depended on the versatility and flexibility of its people to sustain its momentum; during this exciting period of creativity and expansion a powerful bond was formed between the founding members of the company, directors and employees alike. As was boldly painted on one of the office walls, and often declared by Rich himself: We Are All One.Team (Barry 2002). However, the business grew beyond the stage where Jodee Rich knew everyone by name; the trusted people became dispersed, many of them appointed to key roles leading teams of more recent recruits. It seems that an embracing of the enigmatic internal culture was far more prized than solid business experience gained elsewhere. In the very specialised area of information technology, this proved to be a dangerous practice.

6.5.2 The Billing Project

The One.Tel interviewee, a highly experienced programmer specifically recruited for his knowledge of financial systems, was a senior member of the Billing project for about 12 months. He found to his dismay that he was expected to report to (in his opinion) an inappropriate person:

> *My immediate manager was a former help desk person who had been promoted to manager of our area which included the billing system. She had been recently promoted and before her there had been others just as badly qualified...they had no qualifications. The only thing they were qualified to do, was to be good on a help desk. Because of that they were rewarded with a higher post, which involved more money, and less stress than working on a help desk. They saw it as just a desk job. What they didn't realise was, that it was not only a desk job, they had to manage highly skilled, university-trained, diploma-trained people, and tell them what to do.*

The interviewee had a background in traditional system development techniques, and he understood his role to be the introduction of a professional SDLC approach to the Billing project. In reality he found that the business expected him to work around the clock modifying programs to accommodate the latest schemes launched by the marketing team. He recounted how he tried to educate his manager into introducing some basic procedures into the billing project so that, for example, programs were properly tested before being put into production, but to little avail:

> *...I got hardly any support from the senior people there. The little time they gave to you, when they tried to listen to you, you were using words they'd never heard before such as system testing, and precautions, and version numbers, and version control. These were all new philosophies to them, and they didn't make any sense, and to them we were just wasting a lot of*

time. They felt that things could have been done more quickly if we just took the programs, fixed them, and just shoved them straight into production.

6.5.3 The Finale

My interviewee was alarmed at the poor quality of the base system that he was expected to enhance, the inexperience of the leadership, and above all the resistance of the leadership to adopt his suggestions for improving their development standards. It appeared that the original philosophy of the organization, based on flexibility and willingness to change and innovate, did not survive into its latter stages: ideas were only valued if they were presented from the right source, and this did not seem to include suggestions from newcomers with more traditional views.

When One.Tel finally collapsed the Billing system was widely blamed as one of the reasons for its demise: the system was too slow and cumbersome, and it had an alarming propensity for producing inaccurate bills which customers refused to pay (Barry 2002: 193). My respondent's view of the system is particularly interesting, because he is a practiced professional who had an inside view of the system for 12 months:

> *The billing system...was a shocking design. A school kid could have done better. To be fair to the programmer who designed it, it was patched in, it wasn't designed with the forethought that it would still be running after five years and would be relied on so heavily. The company expanded so quickly that the crummy little program that was written just to get things going, a sort of quick Band-Aid solution, became the main production system. And everything was patched around it. Everything was pointing to disaster.*

A few months later, the disaster point was indeed reached, although my respondent had moved on by that stage, well disillusioned by his experience.

I believe that Rich was genuinely shattered by the demise of his company in May 2001. He insisted that he had been let down by his co-directors, Lachlan Murdoch and James Packer, who refused to provide more funding: to the last he was adamant that he was without fault. An interesting observation of my own concerns an occurrence in April 2001, when the company had only four more weeks of existence. I was leading a workshop of about a dozen people relating to a new interface system that I was implementing, and had booked the boardroom adjacent to Jodee Rich's bench (even the CEO did not have his own office, just a slightly larger benchtop than most). Rich caught my eye through the glass partition and nodded. He then gave me a look of the most profound sadness and apology, the significance of which was lost on me at the

time. Subsequently the meaning became clear: he knew the company was doomed and in a tacit way he was expressing regret for the futility of all the effort that was continuing around him.

There is an interesting coda to the One.Tel saga that occurred in November 2009. A legal case had been brought against Rich by the Australian Securities and Investment Commission (ASIC) accusing him of mismanagement of the company, and attempting to make him personally liable to the creditors and seeking to bar him from any further directorships. In keeping with his personal view of himself, Rich fought the case with everything at his disposal. The case continued for 5 years, and the final outcome was in Rich's favour; it is interesting that the court case lasted almost as long as One.Tel existed. Rich naturally saw this as a vindication of his leadership of the company and an indictment of his critics and unbelievers (Carson 2009).

6.6 Conclusion – the Project Milieu

Within every project there is to be observed a setting, some form of structure, and relationships with stakeholders. The mission of the project is to construct and adapt itself within the constraints of its setting, to understand and develop the relationships with its patrons, and manage these variables to achieve its objective. Within each cloud of influence there is a multitude of diversity; there are occasional similarities to be perceived, and many interesting contrasts and variations. My research has served to reinforce that perceived wisdom within the IT community: projects are always unique. We have observed widely differing approaches to the project challenge, a broad diversity of experiences, and outcomes that range from success on all counts down to embarrassing failure. Within each unique milieu the phenomenon of learning is taking place: the many disparate manifestations of learning are explored in the next chapter.

CHAPTER 7: THE PROJECT LEARNING PHENOMENON

From the rich data acquired through my research, and articulated in the previous chapter, it is apparent that the process of learning within information technology projects is the consequence of a number of rather intricate influences and practices all working together. It must also be recognised that learning occurs in many ways and at different levels. In order to guide the understanding of the different aspects of the learning phenomenon, it is constructive to refer again to my concentric layer diagram:

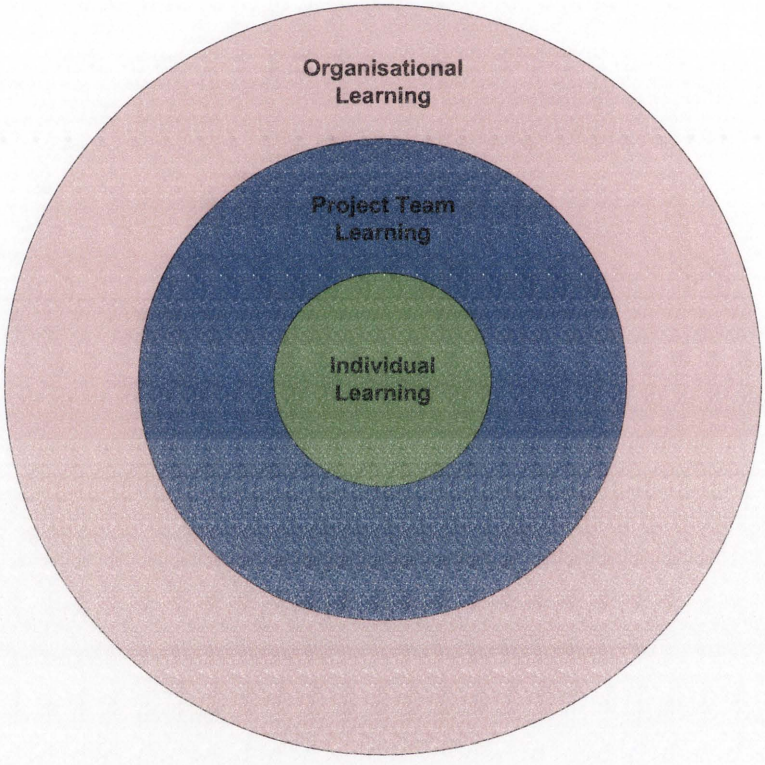


Figure 7.1: Project Learning Associations

The inner circle represents the individual working within both his project team environment and his wider organization. During the life-cycle of the project he or she is subject to influences from the project team and the organization that provide opportunities to learn. Whether those opportunities are realised will depend on many factors and variables that will be examined here. Meanwhile the project team, of which the individual is part, may itself become a learning entity in the course of delivering the project objective. The outer ring represents the organization within which the project operates, and to which it owes its existence. Since teams and organizations are

composed of individuals, and cannot themselves "learn", the lines between the entities are indistinct and the different forms of learning become associated with each other. It is still informative to examine the three different aspects of learning separately, and in the course of the study to recognise where the areas of convergence and cross-over occur.

Within this chapter I examine the ways in which learning took place among the individual members of my research group, the nature of learning that occurred within their project team, and the means by which new and updated project knowledge was transferred to the associated organizations.

7.1 The Nature of Individual Learning

All my research participants believed that they had gained some new knowledge and/or skills from their respective project experiences. The nature and extent of the learning was found to depend on the unique situation that prevailed within each project, and each individual's personal sense making of events, challenges and relationships that they encountered. The following diagram illustrates the influences that were found to affect an individual's learning as they worked within the project milieu:

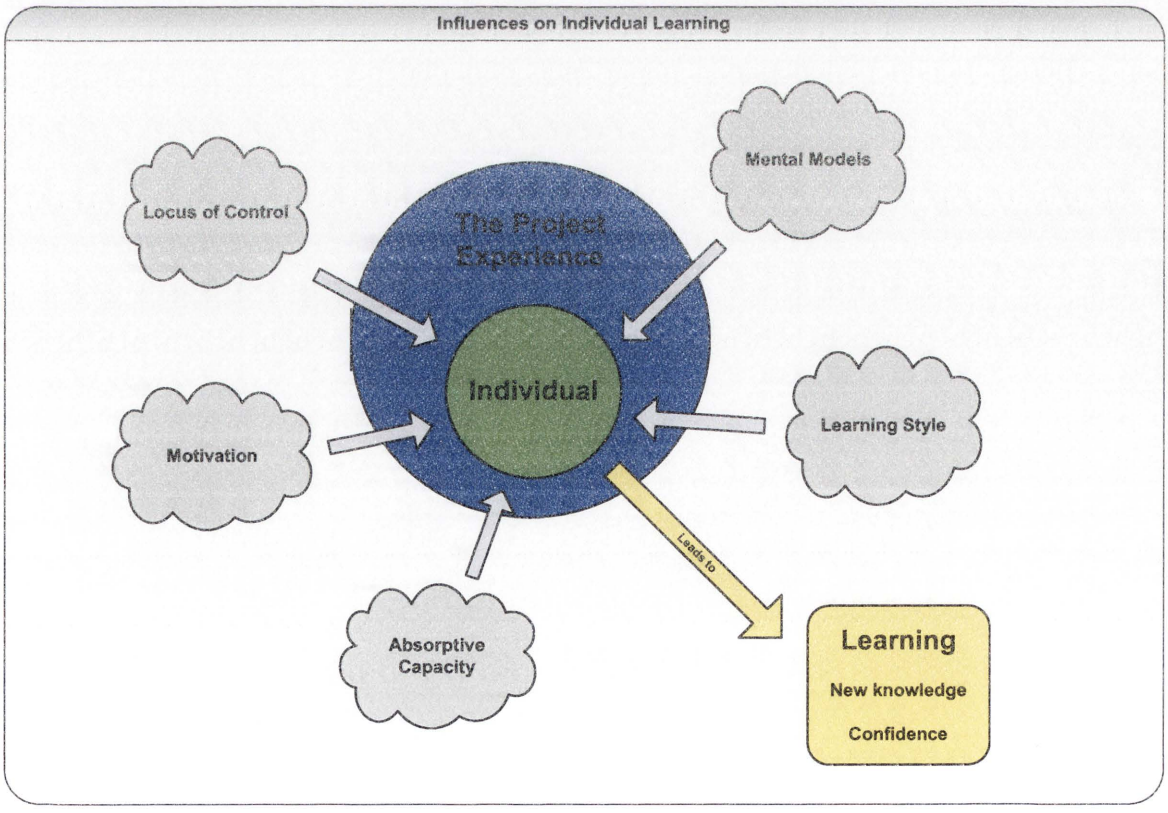


Figure 7.2: Influences on Individual Learning

The subjects within the research group were widely disparate in terms of age, experience and seniority. The group included leaders and specialists of both genders, and contractors and permanent staff were represented in almost equal numbers. In every instance, there was a unique person with his or her own discrete *Lebenswelt*, working within the unique and temporary social structure that we term a project. The learning that each person derived was a function of their own cognitive style, aptitude, and inclination, together with economic and social determinants. Within the context of a single interview it is impossible to understand all these variables, but some very strong indicators were provided within my research material. I have summarised some of the key influences upon individual learning in Appendix 5. By careful analysis of my data I have interpreted the learning that took place, discerned evidence of learning styles and personality types, together with suggestions of mental models and learning motivators. These results are explored in the next sections.

7.1.1 Interpreting Individual Learning

In the course of each research interview, every contributor expressed his or her observations upon the nature of their personal learning whilst engaged in their project situation. In some instances the learnings were manifested as a natural part of the phenomenological interview, and in other cases prompted by means of more specific questioning. However, it was apparent that some interviewees were uncertain when articulating what they thought they had learned; this is consistent with the findings of Jarvis (2007: 22) as he observed: "...if we ask people to describe their learning experiences...they found it tremendously difficult to describe precisely how, or even when, they learned...". It was also evident that some learning was involuntary and undetected, and the result of individuals seizing opportunities as they were presented or adapting their behaviour to meet particular situations. This is also in accord with observations made by Jarvis (2007).

The personal learnings that were stated by each contributor are provided in Appendix 6, juxtaposed with my more detailed interpretation of their learning. By means of hermeneutic analysis, based upon the entire substance of the interview, I was endeavoured to make an informed judgment as to the accuracy and completeness of each individual's claimed learning. Gadamer (1975: 195) maintained that the hermeneutic scholar should subscribe to "the principle that one must understand an

author better than he understands himself". Within the same appendix I have supplied my interpretation of what I believe each individual learned in the course of their project, in accordance with their explication of the experience as it was presented to me during the interview.

The differences between the claimed learning and my interpretation of their actual learning are quite intriguing. I was able to identify a wide range of diversity, from experiences that were far richer than the subject realised, down to instances where I believe the participant gained little or nothing in terms of new knowledge despite their statements to the contrary. Equally interesting were those respondents who correctly recognised and articulated their learning experiences.

Among the projects where I believe the learning was greater than the participant realised, I suggest that number 18 is perhaps the most outstanding. My contributor rather modestly conceded that he felt he had learned how to work flexibly and bend the rules in order to manage better the competing interests of his stakeholders. After careful analysis of his account, I believe that his learning went considerably deeper than he declared. He recounted how he gradually won over his recalcitrant client by consistent delivery of good quality results; how he resolved difficulties with a co-vendor and established an effective working relationship; how he reconciled the conflicting reporting requirements of his own vendor management with those of his client; and how he coached an inexperienced team into an effective delivery unit. The subject has learned how to manipulate the terms of his engagement so that he can both satisfy the client's needs and those of his own organization. He has learned to position his team within a complex political environment, and encouraged them to deal with the pressured working situation and consistently deliver high quality results. I believe these are significant learning achievements, demonstrating ability to recognise new or changing circumstances, and willingness to experiment and compromise to find effective solutions. At the time of the interview, the subject had not fully understood, nor had cause to reflect upon, the learning that had taken place.

An example of a project that presented a major learning opportunity, but a disappointing learning outcome, was number 6. This concerned a troubled project, the original terms of which had been poorly negotiated between the vendor and the sponsor. The subject, who was the vendor project manager, was unable to gain the influence he needed over his opposite number within the sponsoring organization. The subject's approach

appeared to be based on persuasion, or even coercion, to bring the client into line. However, his persuasive powers were ineffective; the relationship with the client deteriorated. The subject did not appear to recognise why his methods were ineffective, and seemed to lack the flexibility to adapt his approach. The project continued on its troubled path, and was ultimately delivered eight months late. Without more in-depth research it is impossible to speculate whether a more cooperative approach might have delivered a better outcome, but it would appear that a failure to learn and adapt may have been a significant contributor to the unfortunate conclusion. My contributor suggested that the learning that he would take forward would be to ensure that client contracts were better negotiated and initiated in future, but I am unconvinced that a reliance on contractual terms would have assisted this undertaking. There is still the opportunity for retrospective learning, but at the time of the interview, there was no evidence of any reflection having taken place.

In some cases, my contributors recognised the learning that had taken place, and were able to enunciate it clearly. The contributor from Project 5, for example, was project manager for an implementation within a state government department, and was faced with serious challenges in gaining acceptance from resistant stakeholders. The subject recounted her experiences very clearly, and she understood how she had effectively used persuasion or manipulation to gain the influence she needed. This seems to have been a powerful learning experience, and there was evidence of both concurrent and retrospective learning. In this case, I believe that her stated learnings very closely matched the reality. The effectiveness of her learning appeared to have a beneficial effect on the project, which was delivered successfully in demanding circumstances. The project manager subsequently used her enhanced knowledge to move on to a more advanced role with another organization.

The three examples described are representative of the patterns that I discerned throughout my research. Where individuals were presented with a challenge, their ability to learn and adapt could result in significant benefit to the project situation. The level of benefit obviously varied according to the scale of the challenge and the individual's degree of influence. Conversely, where there was no adaptive response to a challenge, the effect on the project could be to hinder or constrain it. Where the individual recognised that he or she had acquired new skills or knowledge, and gained the confidence associated with that, they were able to gain both personal and project

advantage from it. Another pattern that was observed was in the circumstance where the project ran relatively smoothly and did not particularly stretch the individual's capabilities. In the absence of stress and challenge the opportunities for significant new learning were not as great, although there was still evidence of skills being enhanced and polished.

7.1.2 Styles of Learning

I recognise that there are many theories relating to the different ways in which individuals learn. For the purpose of this research I have elected to make reference to Kolb's (1984) theory of the learning cycle, and use the Honey and Mumford (1982) learning styles terminology. Through a process of hermeneutic interpretation it has been possible to recognise the marked differences in learning approaches that are evident among my research subjects. I identified all four of Honey and Mumford's learning styles by means of analysing the interviewees' responses about learning, and their more general commentary around those aspects of their projects that interested them. The identifications are not absolute: within the limited context of the interview I can infer only an approximation of each individual's preferences and learning habits. Also I observed that learning styles do not fit neatly into the four classifications; there is frequently overlap into another style which need not always be adjacent in the cycle. My groupings shown below are based upon my assessment of each individual's closest match to a Kolb / Honey and Mumford style:

Kolb's theory	H & M Style	Number	Leadership	Specialist
Accommodating	Activist	7	5	2
Diverging	Reflector	2	0	2
Assimilating	Theorist	7	0	7
Converging	Pragmatist	8	8	0
Total		**24**	**13**	**11**

Figure 7.3: Interviewee Learning Styles

This chart indicates a fairly even distribution of learning styles across the activist, theorist and pragmatist approaches, and a low representation of reflectors. Interestingly, all the leaders were either activist or pragmatist learners. In the following sections I will

discuss examples of each of the learning styles and how the subjects learned and operated within their respective project settings.

Activists

The activist learning style was perceived in seven of the respondents, and is characterised by those who seek tangible experiences and enjoy challenges. In terms of Myers-Briggs (Myers and McCaulley 1985), they are inclined to rely on intuition rather than sensing. This learning style would be consistent with the expectation that the project lifestyle attracts those that appreciate a stimulating and varied working environment.

Interviewee number 1 presented a good example of the activist practitioner who was also a leader: there was a general impression of energy and determination about his approach to achieving his goal. This project had languished for nearly two years in a form of half-life until my respondent was entrusted with it, and it appears that he was determined to seize the opportunity to complete it. There was some residual resistance amongst the user community, but the project manager was disinclined to adopt a conciliatory approach:

> *Once it got into about week three or four of when I took on the project and it started getting some traction, people started realising that it was being taken seriously and it wasn't going to go away. I think they realised that the steamroller was coming and it was better to be on board the steam roller than in front of it.*

The other attribute that this respondent demonstrated was the reliance on intuition rather than sensing, which is consistent with the activist mentality. His approach to gathering and recording information was minimalist, was related solely to the achievement of the project objective, and no provision was made to ensure its availability after the event.

The project was a success on all counts (by his own assessment) and the PM seems to have exactly met the organization's needs in their predicament at that point in time. In terms of personal learning, the respondent was somewhat muted in his assessment of the value of this experience to his career portfolio, as he observed:

> *You gain from every project that you complete...I have done many projects before and there is always something you can learn. If I can qualify this - at the start of my career, the learning curve would have gone up in a 90° angle. The learning curve now is more like a five to 10° angle. It's definitely started to bottom out. I think the main thing I learned from it, was how to*

deal with organizational change. I hadn't dealt with that before, also learning how to deal directly with people who are very openly objectionable to what you are trying to achieve.

My own evaluation of his learning is that it is probably deeper than he is prepared to acknowledge. In his interview there were indications that he has enhanced his management and political skills, and gained an ability to manipulate his stakeholders to achieve his objectives. The project manager in question is a contractor who has since moved on to another senior appointment, and seems to have capitalised on the success of this project and others to have advanced his personal career.

An example of an activist practitioner who was not a project leader (there were only two instances of this) was found in Project 20. As in the previous case, this interviewee gave an impression of an energetic approach to, and enthusiasm for, his role within the project. This project has had an unusually long duration, more than three years, and the continuing challenging nature of the venture has maintained the subject's interest throughout. One of the main areas of appeal has been the opportunity to travel overseas on several occasions:

The most outstanding things for me have been the visits to India, that's been one of the best values for me outside of anything professional. Certainly when I look back in five or 10 or 15 years it's going to be that experience of visiting a place that is so different from my...Western background.

From the professional viewpoint, the subject learned a great deal about his technical speciality, which illustrates his preference for undertaking tangible assignments with measurable outcomes:

When I came into the project, although I was a capable person, I was a little bit underdone in terms of my technical expertise. It's been my opportunity...to build networks and force them to break and be able to report back on that. So this gave me an extraordinary opportunity to get on to some proper big-time networking equipment...with the purpose of breaking it, in order to demonstrate how long it would take to recover. It has been extraordinarily valuable for me to have that opportunity.

The downside to this individual's willingness to take on major responsibility has been the stress involved in supporting a large part of the organization's infrastructure over a long period of time. The impact on his personal life has been substantial, and he is now contemplating a change of career direction away from the on-call technical specialist to something more cerebral and less frenetic, but which also satisfies his activist need to seek new challenges:

While this has been a very successful project for me, and it's pushed my career much further along...my preference would be not to be doing anything like this five years from now. I would like to have a very different role in life. Some of that is because of the project. It's been an extraordinarily stressful thing to be involved in...on Friday or Saturday night I was always afraid my phone was going to ring, and I was always afraid that it was going to be me that had to deliver an answer to some technical issue. Maybe it wasn't 365 days a year, but it was probably 362 days. And that's been a very unpleasant thing.

My interpretation of this contributor's learning is that this has been a high stress / high reward project. Whilst it has been a significant technical learning experience, this has been achieved at the expense of some personal wellbeing. Compared with the respondent from Project 1, this subject seemed less inclined to capitalise on his new knowledge. In this instance personal growth has been achieved, but it may be leading the subject along other pathways.

The leader of Project 19 (another activist) also made particular mention of the stress involved in delivering his project, and indicated his reluctance to undertake anything similar again because of the impact on his personal life. Project 19 was an intensive learning experience, and while the outcome was successful, the subject found it excessively demanding. This appears to be an example of the accumulation of relevant knowledge that contributes to the development of absorptive capacity. Perhaps if this subject is persuaded to accept another challenging assignment in the future, he may acquire the new skills he requires quite rapidly and experience less stress as a consequence.

An example of an activist leader with a short attention span was found in Project 15. The project presented some interesting initial challenges, but the activist mentality (combined with some apparent immaturity) could not maintain a high level of engagement for the duration of the lifecycle:

You have the exciting bit, a new project, you start building all these new services...that's all kind of cool and you want to jump into it. Then you get the phase where there are all these little bits and pieces you have got to finish off, and all the loose ends that you have to tie up, and all the testing of it, and your enthusiasm starts to wane and you have just got to focus on getting it done. Technically, you are always keen on it at the start because it's something new to work on. Anything goes for a certain amount of time, a week, or a couple of weeks, the threshold differs for different people I suppose.

A one or two week duration of enthusiasm is insufficient to support most project undertakings. If this individual is to progress much further as a leader within the IT industry, it will be necessary for him to manage his natural activist tendencies and develop greater resilience. The activist approach seems to be very appropriate within the project setting, and frequently in leadership, but it perhaps needs to be tempered by experience and learning. The subject claimed to have learned the importance of accurate requirements gathering; however I am unconvinced. I believe that he found the project considerably more challenging than he expected, and that his knowledge of project management techniques was inadequate to deliver a good quality outcome. He was forced into a demanding situated learning experience with which he clearly was not comfortable. He appeared not to relish the learning opportunity and preferred to retreat from it back into the technical domain with which he was much more comfortable.

Reflectors

Reflectors constituted a small presence in the research cohort, with only two respondents positively identifying within this group. I believe that the respondent for Project 24 fitted the reflector style fairly well, demonstrating characteristics of being a gatherer of information, observant and analytical. It is also significant that the subject was not a regular project participant: he was co-opted from a staff position to fill an urgent vacancy in the team. The project role involved the methodical testing of a complex application, compiling test results and reporting each night by teleconference to the corporate headquarters. It was a task requiring the development of an intensive and detailed work regime, and a high level of dedication over a six month period. The subject appears to have been equal to the assignment, but was unimpressed by the poor quality of the project leadership that obliged him to work alone under pressure for so long. The demands of his role did not prevent him from analysing the functioning of the project, and he made a number of shrewd observations in the interview, for example when discussing the lack of preparedness of the business to engage with the new system:

> *My perception was that the business had not been properly consulted, and the level of engagement had not been adequate in terms of defining business requirements and business needs. This became very visible when you started the testing, when you were involving those business people as testers, and it was very apparent that their understanding of their needs had not been worked out properly.*

The same respondent was also very critical of the lack of documentation that was available and the failure to adhere to standards:

> *...a lot of the corporate material was very generic, and did not meet local business needs...the documents that I saw didn't seem to me to fit within any known project methodology. There could be a learning from that to give it more robustness for future releases, maybe a more structured methodology could be used.*

The poor quality of the reference material was obviously a concern to his reflecting style, which contrasts with the activist approach which tends not to prioritise documentation to the same extent.

The personal learnings that this respondent gained from his project experience were not clearly articulated: he mentioned that future projects need to be planned better, and more time should be spent defining business requirements. These are two areas that were obviously not well managed, but they do not represent personal growth factors. My strong belief is that this subject learned very little from this experience, and was relieved to see it finished. Although he may have been nominally well suited to the detailed nature of the task, the lack of leadership and direction, together with the failure to acknowledge his considerable efforts, converted the exercise into a chore.

It is notable that the reflecting learning style was so poorly represented within my research group, and this may well be because the project environment is not particularly attractive to those that are by nature cerebral assemblers of information. The reflector described in the previous paragraphs was a somewhat reluctant project recruit, and the other reflector, the respondent from Project 4, subsequently moved away from a reflector / diverging discipline and into a new role as a project administrator.

Theorists

This learning style is characterised by logical thinking, and the development of ideas and theories. I identified seven of my respondents as theorists, all of them in supporting or specialist roles rather than leadership. These individuals were characterised by clear thinking, diligence and persistence with onerous tasks. They occupied such positions as business analysts and system architects, and it is apparent to me that every project team needs such people to provide the underlying motive power.

A very good example of the theorist mindset at work was provided by my interviewee number 3, who was a business analyst engaged on the delivery of a substantial retail

banking application. The position involved the gathering, collation and presentation of end-user requirements over a timespan in excess of two years. This was a demanding exercise that culminated in a favourable project outcome, and considerable new learning for my respondent. The ability to provide sustained effort at the detail level over an extended time period was also demonstrated by respondent number 7, who was also a business analyst and, incidentally, also female. In both cases, my subjects felt (I believe accurately) they had considerably improved their personal business analysis skills, which would satisfy their theorist learning inclination. Interestingly, both also commented that they had learned how to engage their end-users and build productive relationships, as subject number 7 observed: "ultimately, it's all about personalities and dealing with them". I believe that respondent number 7 also developed considerable powers of perseverance and resilience while engaged in her very demanding assignment over a long timeframe. I would surmise that the theorist style combined with the ability to communicate and relate with stakeholders is a very powerful combination in this type of specialist role.

Another theorist employed in a rather different role was interviewee number 2. He was hired as a business consultant by a manufacturing firm to provide specialist knowledge in the field of materials requirements planning. The assignment provided an opportunity for the consultant to revisit his MRP text books and design a system based on classical theory, which was doubtless appealing to his theorist learning proclivity:

> *That was the first time that I've ever got involved from the design stage, and seen it through to the end. I've also learned a lot about that industry and I've learned a lot about supply chain management, and how things happen in the modern world. A lot of my previous knowledge in this area was from about 20 years ago.*

Despite the respondent's claims of substantial learning, I remain somewhat unconvinced. In some respects this seems to have been a rather routine assignment, rather than an in-depth commitment. However, the project is understood to have been outstandingly successful in shortening manufacturing lead times and reducing waste, but the consultant admitted that the system was left largely undocumented. When the undertaking was concluding he accepted another consulting role elsewhere and moved on. The knowledge of how the system was designed and implemented remained largely with him, and very little evidence remained with the organization. The theorist

approach perhaps does not always indicate a willingness to commit ideas and theories to permanent record.

Pragmatists

Pragmatists are those who are practical, problem-solving people who are capable of making decisions; I identified eight of my respondents as fitting this learning style, all of them in leadership roles. These respondents all demonstrated the ability to use their knowledge to create practical structures that addressed problems, to make decisions, and to organize themselves and their teams to undertake their respective assignments. The respondent for Project 22 exactly demonstrated these qualities. When a situation presented itself that required decisive action he was quite prepared to take it:

> *[The service provider] was a bit delinquent at that time. We got them to change their project management practices and processes, and join the way that we did things...we got ourselves a very good [service provider] project manager. Because they were basically losing business...we got them on board eventually. Within 3 months we had it fixed.*

He was also very versatile and comfortable running multiple streams of activity: "I was covering a multitude of roles. I was running all the commercial and financial activity and all the infrastructure stuff". This same respondent was uncertain about new learning he might personally have gained from his experience. He seemed to perceive the role as an exercise in applying his considerable management skills rather than an opportunity to advance his own individual knowledge. I believe that he learned to adapt to the conflicting cultures across two very different organizations, and that he was influential in getting them to work together. He spoke very highly of his colleagues and learned to work effectively with all of them. This was a high pressure situation but he made no mention of stress. I think he made great use of his existing knowledge and skill, and learned rapidly about blending cultures and optimising the contributions of his colleagues. There was strong evidence of a highly developed absorptive capacity.

The leader of Project 16 displayed some similar characteristics, being decisive and prepared to address obstructions that were hindering progress:

> *And if we didn't get a good level of cooperation we would take it to the next level, if it was something that warranted that. We didn't take everything to the next level because it's not worth it; you want to choose carefully those things that you escalate. Now and again we would do that when we were not getting quick answers.*

He was also able to take full advantage of a fortuitous delay by the client to ensure that his system was production-quality at point of delivery. This respondent was able to articulate clearly and accurately the learning he had gained from his experience. At the managerial level he learned how to coordinate a widely geographically dispersed project team. In social terms he learned how to cope with a particularly uncooperative team member and make him productive, and how to recognise moods in himself that affected his performance. The sense of this project was that it may have been relatively less pressured than number 22, and there were opportunities for reflection. This individual conveyed an impression of being very controlled and measured, and this was his means of dealing with stress. There was some evidence of a developing absorptive capacity.

A further example of the pragmatist approach was the leader of Project 17. He demonstrated planning and organizing skills, and a practical and decisive approach to the many challenges that confronted him. When questioned about the personal learning that took place, he replied:

> *From my point of view it was the biggest project I have ever run, so it was interesting to work at that level, directly with the project director. I am a straight down the line person, and I call a spade a spade, and I always told him what was going on. I think he appreciated that.*

Further attempts to draw out this information did not yield any clear expression nor any apparent substantial learning outcome. I believe this respondent probably gained considerable learning over the 18 month project duration, but his practical pragmatist mindset is not inclined to reflection and he has difficulty articulating the benefit he may have gained from the experience.

7.1.3 Learning Styles and Project Leadership

It has been interesting to realise that all the project leaders in my research cohort were drawn from the activist and pragmatist styles of learning. Projects present widely varying challenges and therefore require leaders with dissimilar mindsets and skills.

Among the activists, the leader of Project 1 seems to have been ideally suited to the task of tackling the endeavour that had defeated many others previously. It appeared to require someone with the energy to marshal resources, override objections, and work to a dynamic design. By contrast, the activist leader of Project 15 was interested in his task only while it involved the generation of attractive application features. The

mundane task of requirements gathering was a chore to be avoided: this project may have benefited from a more pragmatic approach.

The pragmatist leader of Project 16 seems to have had a mindset very appropriate to the nature of the tasks undertaken by his vendor organization. He gave a strong impression of being solid and reliable and a proven performer: his management required no reporting from him and rarely checked on his progress. By contrast, the pragmatist leader involved in Project 10 seemed to be almost paralysed with indecision when his project started to go off the rails. Perhaps an activist approach involving more energy and more intuition might have produced a more productive outcome.

The leader of Project 5 was essentially a pragmatist but displayed considerable flexibility and intuition. She invested the time to understand the resistance she was likely to encounter and devised a means to counter it. Number 6 became problematic, at least partly because the pragmatist leader failed to build a productive relationship with his stakeholders. Projects 19 and 21, in both of which there was a great deal of uncertainty, seemed to thrive with activist leaders. Meanwhile number 22, which was a massive exercise in coordination and marshalling of resources, probably required a variety of skillsets at different levels and the pragmatist approach was very appropriate within the leadership. Project 11 also depended on thorough organization, although on a much smaller scale, and the pragmatist approach functioned well in that instance.

From these observations, it is apparent that there are many advantages in matching the type of project, and the challenges that are anticipated, to leaders with particular personality attributes. In my experience, the most effective and versatile project leaders are undoubtedly those that display multiple proficiencies and can freely adapt their style. It has been my privilege to work with one such leader on two occasions. He was at different times, both activist and pragmatist, intuitive and sensing, politically astute, fearless in presenting a case, with a highly developed absorptive capacity. He combined this with a most impressive technical understanding and considerable charisma and humour. With his chameleon-like skills he would be difficult to classify in any meaningful way. He has acquired a number of followers who observe his dexterity, and hope by a process of osmosis to acquire some of his skills.

7.1.4 Mental Models in Practice

By employing subjective hermeneutic analysis it has been possible to discern distinct mental models among many members of my research cohort. Associated with this, it has also been possible to make an assessment of their locus of control and dominant assumptions as suggested within their accounts of their experiences. I should preface this analysis by observing that my assessments relate only to the way in which these individuals approached their project situation, and may certainly not be indicative of their wider attitude to life. The writers on the subject of locus of control tend to give an impression that is a dominant life force, for example Rasch and Tosi (1992) and Srivastava (2009); however I believe that in my researched project contexts it may be a condition that exists only for the duration of the experience.

I have composed a series of phrases which I believe represents the dominant assumptions and mental models that some of my respondents brought with them into their project situation:

Respon-dent No.	Locus of Control	Dominant Assumption	Translation into the Project Situation
1	Internal	Self - I am competent	I understand how to run a project and I will demonstrate my ability to the management and to all the people involved in the previous failures
2	Internal	Others – are incompetent	Production workers are not capable of contributing to the design of this new system and should just be instructed how to use it
4	Internal	Others – are competent	This is an excellent learning opportunity and I am going to maximise the benefit to my career
5	Internal	Self – I have an insight into this mindset	I understand how to work with public servants and over time I can convince them that my way is best
6	Internal	Others – need to be controlled	The way to bring a recalcitrant customer into line is persuasion and confrontation
10	External	Others – are incompetent	This organization is clueless compared to my previous employer
11	Internal	Self – I am competent	The principals of the client organization have sought me out specifically to lead their project and I will manage it meticulously and meet their expectations

Respon-dent No.	Locus of Control	Dominant Assumption	Translation into the Project Situation
12	External	Others – are incompetent	All projects are different and it is impossible to estimate how long a particular task might take; there are too many inexperienced people trying to make estimates who really have no credentials to be doing so
15	Internal	Self – I am special Others – are timewasters	I am a creative person who is best employed developing attractive new systems, and not listening to nitpicking customer complaints
16	Internal	The world – is transient and unreliable	I do not believe in generating system documentation because nobody reads it and it rapidly becomes outdated
22	Internal	Self – I am competent	I am a highly experienced project manager and I understand how to organize complex projects and multiple teams of people
24	External	Others – are disorganized	I am not naturally a project practitioner and this is not my comfort zone

Figure 7.4: Mental Models among the Research Group

I believe that these relate very well to Senge's (2006) observations on mental models: some are based on prior personal experience, some are perceived wisdom, and others are accepted business practice. There is evidence that these mindsets and assumptions are powerful drivers of behaviour and are also indicative of the receptiveness to learning shown by the individuals. Those with an external locus of control were inclined to believe that the conduct of the project was largely out of their control, and that they were not in a position of strong influence. Accordingly they were disinclined to experiment or to initiate constructive change; as a consequence, their learning was inhibited. For example, the specialist test manager in Project 24 was a reluctant recruit to his team, and expressed dismay at the working conditions and the incompetence that he saw around him. He felt powerless to influence the corporate machine that was directing operations. As a result, he retreated into a virtual cell and appeared to make no contribution beyond his specific terms of reference; as an exercise in learning it was very limited. Another example at a more senior level concerned the manager of Project 10. The individual seemed to feel that he was in an impossible situation: the terms of the project contract were seemingly not achievable; the vendor was unable to deliver; and his management was, in his view, incompetent. The respondent did not perceive this as a challenge, but as an impossibility; and perhaps he was right. He seemed not to attempt to take control of the project but rather allowed it to continue its downward path

towards cancellation. One can only speculate that someone more prepared to take the risks associated with situational learning might have been able to salvage something.

Those with an internal locus of control exhibited the opposite tendency. For example, the respondent from Project 1 believed strongly that he had the ability to rescue a problematic situation, and demonstrated a willingness to understand and counter the resistance, and to bend the rules as necessary to carry the project and the team to a favourable conclusion. The result was, I believe, a very powerful learning experience.

A somewhat different situation is illustrated by Project 22. In this case my respondent, the Programme Director, had a strongly internal locus of control and a powerful sense of his own capability. He exhibited all the management competencies, and demonstrated great dexterity and skill in dealing with the complexities of a very large project. There is no doubt that he learned rapidly and seamlessly as the project progressed, and adapted to each new situation as it arose. He was not able clearly to articulate what he personally had learned, although he was very positive about the contribution he had made to the learning of others. I believe that this is a positive example of the theory of absorptive capacity. The accumulation of prior relevant knowledge was such that he was able to acquire rapidly the skills he needed in this context, and he was able to put his new knowledge into use quickly and effectively.

7.1.5 Learning through Risk Taking

The concept of the internal locus of control and the assumption of personal competency leads directly to the preparedness to think and act "outside the square". In reality this is a reflection of the confidence and flexibility to scrutinise one's mental models and transform those that are inappropriate to the setting or task. I believe that this important project skill equates very closely to the Argyris and Schön (1974) theory of double-loop learning. Many project leaders reported the need to think laterally and creatively to steer around obstructions and maintain project momentum, and it was apparent that some were far more inclined to experiment than others. It was also clear that the assessment of the issue and the resultant action frequently need to be made quickly and under pressure, which adds a further element of risk.

There were several examples of projects being taken by surprise by unexpected events, and it was intriguing to hear how the issues were tackled. Project 12 had actually

completed and the system was in production, when they discovered that a critical interface had been overlooked:

> *We had to find a way for them to get data from a desktop into the system. We had not planned for that, we thought we had covered everything from an interface requirement, but this was brand new and presented a new challenge. It should have been a change request, because we actually had to source some new desktop software and get that tested and certified by the desktop service provider, and then deployed to the desktops. As an interim measure we actually did the installation of the software...on the desktops ourselves and then let the formal process catch up.*

This was a good example of a quick response to an urgent problem that was harming the business, and a circumvention of the formal regulations to engineer a solution.

Another ingenious solution was employed in Project 17, where one vendor was having difficulty understanding another vendor's application package to which they needed to build interfaces. The problem was solved by "loaning" an expert programmer to the other vendor. The interviewee explained it thus:

> *We put our Java guru into their team, the package vendor's team, which was a knowledge transfer thing. He was actually noticed back in Dublin, where the package came from, as somebody who had a lot of capability and was actually telling the vendor how to write the package. In the early days he was just doing his coding, and then he would come into me and say, you know this isn't designed correctly, there is going to be a problem later on. In the end when there was a problem with it, he would fix the code, open up all the areas that he wasn't supposed to open up, and send back the result with the problem solved.*

This creative move solved multiple problems as the project progressed: it provided an inside view of the application package, a full understanding of the database contents, and an opportunity to anticipate future discrepancies.

The project manager in Project 18 was faced with a situation where he could not follow his vendor organization's methodology, because to do so would mean that his part of the project would simply stall. He has needed to be exceptionally flexible and pragmatic to keep delivering for a customer that does not follow its own rules:

> *I have learned to be more amenable to doing things outside of a normal project methodology. The methodologies are there, you follow the procedures: change control, issue registers, risk registers. If I get audited tomorrow I am going to fail because I haven't followed the methodology. But in terms of being able to deliver, yes I can deliver. It's been a balancing act. The philosophy within [the customer], even though it's supposed to be based on Prince-2 methodology, in reality it's whatever happens on the day.*

There were other examples where projects made bold decisions to maintain momentum, and in each case the decision appears to have paid dividends. Project 19 was planned around using the services of an American software integrator, and an agreement was signed to that effect. Communications with the vendor were difficult and unproductive, and when the first deliverable proved to be unusable, the project manager (my interviewee) realised that his project was stalling and that a difficult decision was required. After considerable research a replacement vendor in New Zealand was located and signed up; a substantial outlay paid to the American vendor was written off, but the NZ team performed to the required standard and the project was rescued. The project manager admitted that it was a bold decision and it caused him great personal stress and anxiety, but ultimately it proved to be a good choice.

Another example of a project manager faced with an incompetent vendor was found in Project 21. The task was to develop an interactive website, and a specialist web-design software company was hired to deliver a system:

> *We brought in an interactive agency. We interviewed a bunch of them, and we did our due diligence. We picked the one that seemed to be able to meet both the creative and technical needs, and [it turned out] they had no technical skills whatsoever...after about three weeks in, we were saying, my God these people are clueless. So I sent my whole team over to work with them on their site, and we rescued them...but as soon as the first phase of the project was complete after six weeks, they were out.*

The agency that had been hired was believed to be the best available, and the design and development work they produced was worthless within the stringent commercial context. The project manager realised her project was doomed unless she took some decisive action. The agency was fired after six weeks and the software development was brought in-house. This created some political issues within the organization because additional contractors were needed and other development work had to be rescheduled, but the project was saved and ultimately delivered satisfactorily.

Probably the most outstanding example of risk-taking occurred within Project 22, when the leader informed the sponsoring companies that their enormously expensive project was not a 12 month undertaking, but required 24 months. Effectively, the leader put his job on the line. After due discussion, the extension was accepted and the project was subsequently delivered on time. An outcome such as this can only really be achieved if there is a substantial accumulation of relevant prior knowledge, and a highly developed

absorptive capacity. This example is in direct contrast with the unfortunate Project 10, where the project manager found himself in a similar situation with a project timeframe that he recognised was not achievable, but was unable to persuade his management that that the project required re-negotiation. The relationships were less robust; the absorptive capacity less well-developed; the courage to take risk appeared to be absent. Ultimately the project sponsors determined that their patience was exhausted and the project was cancelled. The respondent laid the blame on incompetent management and a non-performing vendor; but perhaps he had allowed a rare learning opportunity to escape.

The above examples illustrate some of the risks that were taken by project leadership in order to maintain project momentum and deliver successfully: at times it was necessary for the project to explore and transform the assumptions that underpin business-as-usual attitudes. The research data revealed another interesting fragment of information: nowhere in the material are there any mentions of "outside the square" decisions that produced an adverse result. A failed experiment will frequently be a valuable learning experience, and it is perhaps unlikely that such decisions can always be good quality; there may have been some element of filtering or selective memory employed.

The opportunity to employ such double-loop responses is a powerful creator of new learning (Argyris and Schön 1974), and it is likely that the incidents recounted above were influential on both the leaders and the team members. However not all projects presented such opportunities. The projects that lent themselves to experimentation and risk-taking (and consequently provided the best learning opportunities) tended to have some exposure in the upper right quadrant of project types, with strong elements of uncertainty around goals and process.

Conversely, there were several instances of projects where risks were closely monitored and managed, and experimentation was neither encouraged nor appropriate. When goals and methods are clearly established, budgets and timeframes have been set, the expectation is on delivery and not on diversions. In such projects, progress towards objectives is high and learning opportunities are few (Loch et al. 2006). This introduces an apparent paradox within the PMBOK guide to project management. On the one hand it encourages the project manager to anticipate and mitigate all possible risks, and on the other to maximise learning opportunities (Saladis and Kerzner 2009). It could be argued that the two goals are mutually exclusive. With the exception of the examples

described above, most projects adopted a risk-averse approach which is the accepted practice and the method most likely to be appreciated by the majority of organizations.

7.1.6 Motivation to Learn

In general, there was a perception of a high degree of motivation by individuals to work diligently towards a project outcome, and by association, to acquire new knowledge and skills. The exceptions to this tended to be where the respondents were involved in projects that were severely troubled, such as numbers 9 (One.Tel), and 10 (cancelled). There were other examples where motivation seemed low and concurrent learning was minimal: Project 15, in which the subject lost interest when the client became too demanding; and Project 24 in which the subject was a reluctant and unappreciated recruit. These troubled projects presented significant learning potential, but in each case the opportunity was largely unheeded. The respondents were able to recall some learning that had occurred retrospectively, but the memories were not agreeable nor readily recounted.

There is an interesting contrast with Project 4, which was ultimately cancelled, but the respondent nevertheless found it an extremely positive experience:

> *I moved into the project team as a transition and implementation analyst. I really learned a lot. As a service desk analyst, I learned a lot of technical information, and in the project team I learned a lot about how projects work. From the results that we'd had, I think the project was going to be a great success. A lot of that comes down to the value and the training that you put into the guys that are going to perform the roles. I think that was second to none. It was really well done, and that was reflected in the performance of the people.*

Within the other projects, where the outcome was favourable, and job interest was high, motivation to learn was very evident. Within a number of projects the motivation seems to have been the challenging nature of the task, and this was observed particularly amongst the activist participants engaged in projects with elements of uncertainty (Harrison 1997). Two respondents (numbers 11 and 22) appeared to be motivated partly by a sense of responsibility because they had been personally recommended by professional acquaintances to take leadership of their respective projects; in both instances they justified their appointments. Other interviewees seemed to identify strongly with their employers, whether they worked for sponsor or vendor, and

demonstrated a strong professional motivation to deliver to the best of their ability and to learn concurrently.

There was another cohort, who demonstrated both considerable professionalism and a marked willingness to learn, and their motivation was almost entirely personal. This group comprised the contractors, and there was evidence that they were concerned with generating personal value to enhance their prospects in the marketplace (Raelin 2008). That does not imply that they were less diligent or loyal to their temporary employer than the permanent staff, but it reflects the reality that they have a need to take into account their next assignment. Consider this quote by respondent number 8, the SAP specialist:

> *When I got this job up here in Sydney, I had a 10 minute interview. Then they said, can you start on Monday? We worked out the terms, and I moved up here to Sydney. In fact I'd like to stay here longer, because there is so much to learn about the business and new software. I can really make myself very attractive to new projects by learning all this stuff.*

Contractors in particular are concerned with enhancing personal worth by means of membership of social networks. The value of these networks may firstly be in enabling the finding of new assignments, as one contractor observed: "When they hire contractors, a lot of them they already know, so they don't need to interview them. A lot of companies in this line of business work the same way". Secondly, a person's worth may be enhanced because they know additional reliable people who can be contracted to provide special services. This was the case with respondent number 11 who had a large number of technical associates, who helped him deliver his project:

> *[I knew] building management, contractors for phones, cabling, electricians and people like that. That was all part of my responsibility. It went pretty smoothly because I worked with most of these people before.*

This corresponds exactly with the observations of Cross (2007) who believes that in the knowledge-based society an individual's value lies not just in his personal attributes, but in his support systems and contacts.

7.1.7 The Gender Difference

There were some intriguing differences between the female and male behaviour, both within the interview situation and their approach to, and understanding of, the learning phenomenon. My female research contributors numbered only five, and therefore it is

unrealistic to assign too much significance to these observations, however there was an interesting consistency within their data. There was a distinct tendency by the female cohort to interpret my questions as relating to relationships and social constructs, while the males were more inclined to respond in more concrete and less abstract form. Also, the responses suggested that the females were inclined to assign a higher value to learning about building relationships with colleagues and stakeholders, rather than learning about techniques, methodologies and management skills. The third observation was that the females tended to understand my research motivation and my questioning about learning more distinctly, and consequently provided answers that were more clearly expressed and articulated.

The female leader of Project 5 illustrated all these observations particularly well. The project involved the implementation of an information security standard within a government department, and was therefore concerned with procedural and attitudinal change rather than the adoption of new technology. The interviewee learned early that, if the venture were to succeed and deliver lasting benefit, it was necessary to initiate a change in mindset amongst her stakeholder group. This point seems largely to have been lost on her (male) stakeholder team:

> *I think they thought that the job could be easily contained. It was simply a matter of hiring a contractor, we give her a few people, she goes and sits in the corner and does the job, we get our tick in the box and then we can get back to normal life.*

My respondent did not see the task in such simplistic terms, and adopted an approach designed to persuade the management team that the change was more challenging than they believed. In order to achieve this, the project leader had to use a considerable amount of guile:

> *I certainly learned to be a little more manipulative...but when you have so many people trying to sabotage what you're doing...not sabotage exactly, but not interested in what you are doing. You need to convince people that it is in their best interest to come on board. You learned to plant little seeds of ideas so that they come up with these fantastic ideas that you wanted them to come up with.*

The project leader learned therefore that the transference of ownership of ideas to a key stakeholder is one of the means to effective engagement. None of the male respondents within my research articulated this notion of exchange of ownership, nor of seeding ideas within the stakeholder group. It would seem that, in this instance, the emphasis on

relationships and the understanding of cultural norms and mindset, was critical to project success. Based on my research, the male approach might have placed more emphasis on method and less on perception, and the outcome been perhaps less robust.

My Project 5 respondent appeared to enhance her skills considerably during the course of the delivery of her demanding endeavour. I have identified her learning style as converging or pragmatist, but at the same time she demonstrated considerable intuition, and this was the only instance in my research of this combination of attributes. She appeared to be practical and decisive, and simultaneously perceptive and sensitive towards stakeholders and team members. The intuitive attribute typically does not lend itself to the creation of formal knowledge (Sense 2007), and her project involved the development of a large volume of procedural documentation. To address this, the PM assembled a team of specialist writers who provided the necessary sensing qualities and delivered the required material under her guidance.

It is compelling to contrast the Project 5 experience with that in Project 6. Both took place within government departments, and both depended on the effective engagement of resistant stakeholder groups. My Project 5 respondent showed considerable tactical ingenuity to achieve this, whilst the male respondent in Project 6 relied on an uncompromising confrontational approach. The latter project was impeded by a lack of client cooperation and there was a conspicuous failure to adapt to circumstances and build relationships. As a consequence the project had a particularly troubled existence. A more adaptive approach in that instance, such as that demonstrated by my female Project 5 contributor, might have yielded a better outcome.

Project 21 was also undertaken in a very hostile cultural setting, and again the female project director learned to understand the nature of the resistance and devise effective ways to address it, particularly as the major stakeholder group was also comprised of females. When her male project manager had a serious altercation with a senior member of the business, by this stage the project director had learned an effective way to rectify the situation:

> *At one stage, just by asking some sensible questions, he even made them cry! Then I had to counsel him and say, I need you to go and say sorry. He said, but I didn't do anything wrong. I said, I know you didn't do anything wrong, but it just looks really bad to leave the client crying in the office! I said, just go and say you're sorry and buy her a muffin or something. So he did, and he helped us deliver the project.*

It may seem an insignificant incident, but I believe that my respondent had recognised a potentially threatening circumstance that might have resulted in ongoing tension and project delay. The male participant, despite his prior experience, failed to recognise the risk and had no strategy to deal with it. Under further coaching from the project director, the male PM learned how to deal effectively with the stakeholders, using a socialising approach rather than the straightforward business technique with which he was accustomed.

The leader of Project 21 also learned that her team operated more effectively if she protected them from the eccentricities of the organization. The team practice was to work different hours from the main workforce and this incurred considerable disapproval, which my respondent regularly needed to counter:

> *I was constantly fighting these rearguard actions against other people's perceptions. The reality was that we were delivering an enormous amount, above and beyond my expectations, and getting no recognition.*

As previously recounted, she clandestinely moved the team away from the business group so that they were not exposed to constant interruptions and distractions. The avoidance of conflict with the business seems to have been a key learning for her, and it appears to have been beneficial: she held her team in very high regard and was very complimentary about their productivity.

The leader of Project 5 also learned that her team functioned more effectively if she cultivated intra-team relationships. This observation regarding relationship building is consistent with Constantine (1995: 38) who noted that "women understand collaboration a lot better than [men] do…Females, as a rule, are much better at building relationships, supporting and motivating each other".

The female programme director responding for Project 14 was probably the most senior person in a permanent staff role that I interviewed. It was very encouraging that she was very aware of the importance of the propagation of learning both within and across projects. In the light of that, she related very readily to my questions. She acknowledged the difficulty of promoting project learning, and made this observation which I am sure would be echoed by many others in her position:

> *There is a lot of turnover in IT organizations. Sometimes there is not enough time available at the beginning and end of projects to make sure that you don't reinvent the wheel. You know, to look at what may have been*

done before and to document things at the end of the project, and then to reinforce it with other projects that are going to start up. I think it's a challenge for any IT organization. It will always be a challenge because of the business priorities. Things need to be delivered immediately, and you don't have a lot of time.

This same respondent also made other very insightful observations concerning fixed price contracts, and in regard to project practices, which are recounted in the respective sections. She was almost alone among my respondents in recognising the importance of project learning and actively trying to promote and encourage it.

7.1.8 Learning from the One.Tel Project

The One.Tel billing project was a casualty of the collapse of the company, and my respondent (interviewee number 9) was a committed member of the team for a full twelve months and it is interesting to understand what learning he may have gathered from the experience. In the initial part of the interview, the subject was inclined to view his learning largely in a negative context. The overall experience had not been enjoyable, and he felt that the major personal gain had been the opportunity to see at first hand the effects of incompetent management, so that he could recognise and avoid these practices in the future. The lack of proper development facilities, such as program source control and test systems, seriously offended his theorist inclination towards organization and logical arrangement, and he was utterly frustrated by his failure to bring order out of chaos. The obstruction of his best efforts served to reinforce the importance of ensuring these controls were maintained in the subject's future workplaces.

Under further questioning the interviewee was able to discern other benefits that may have accrued to him. Another major learning was the development of the ability to be self-sufficient and self-motivated, which was due to the lack of effective leadership and almost complete absence of guidance. The experience of operating independently and making his own decisions about important design concepts provided valuable learning for subsequent contracts. However, the subject conspicuously failed to observe any fault in himself. The role presented a signal opportunity to understand the challenge and try to use his persuasive powers to make positive change: to learn to adapt his approach to avoid confrontation and to engage in constructive debate. He did not recognise a learning opportunity, only an argument that he could not win.

In summary, the constant pressure to change the billing system without notice to accommodate the whims of the marketing team created a very high stress environment that ultimately precipitated his departure. If One.Tel marketing had been less ambitious in their invention and promotion of new plans, the billing team may have been able to retain their experienced staff and stabilise the system before disaster overtook it. This observation was reinforced incidentally by a discussion that I had in 2009 with a former senior telco executive from the United Kingdom. He remarked, entirely without prompting, that if a telco business fails to keep its marketing team under control they will cause downstream chaos in the billing system. It seems that the One.Tel experience is not unique, although the consequences are not usually terminal.

7.2 Team Learning within Projects

Learning that took place at the team level (rather than the personal level) during the course of the project life-cycle was more difficult to discern, because the interview process was limited to a single individual from each project. To understand this process in detail would involve an ethnographic study. In order to discover the effectiveness of team learning I searched for indications within the structure of the project, the openness of discussion and dialogue, the diversity of cognitive process, and evidence of creative abrasion. My interpretive summary of the learning that took place within project teams is presented in Appendix 7. The more significant indications of team learning that were observed are discussed in the following sections.

7.2.1 Cognitive Apprenticeship

There were two projects in which I was able to discern some evidence of the phenomenon of cognitive apprenticeship occurring. Project 14 was subject to severe and ongoing problems with non-performance by a vendor. The Program Director, my interviewee, felt obliged to take a close personal interest in order to coach the project manager in the techniques of vendor management. She encouraged and motivated the PM to remain engaged in very difficult circumstances, to the point where he was able to take full control: this appears to have been an excellent example of the use of coaching within the zone of proximal development, and the progressive removal of scaffolding (Vygotsky 1978). There was another example within Project 21, where again the Program Director provided coaching to her project manager in the appropriate way to

deal with inexperienced business stakeholders. An example of the nature of the support she provided is given in section 7.1.7. Although there was evidence within the interview that the Program Director had provided some skilful and adroit coaching techniques, she did not seem to perceive that she herself had been instrumental in the PM's development. She commented:

> *The thing that impressed me about him was that he was humble enough to adjust to the way the client is. I think he grew from it. As a person he was able to take it all on board, which a lot of guys would not have been able to do. I thought he was a good PM but he impressed me more when he was able to do that. I think it has made him a better PM.*

It is interesting that in both instances the more senior person was a female providing mentoring to a more junior male.

7.2.2 Formal Training

It is apparent that the majority of the researched projects were not recognised as opportunities for any sort of formal apprenticeship, grooming or coaching. However there was one notable exception to this that should be highlighted. The leadership of Project 4 implemented a highly effective formal programme of training and cross-training for the more junior team members, in order to maximise their skill levels. As my contributor observed: "they were really giving them the knowledge and skills to perform their job at the highest level". The learning experience was much appreciated by my interviewee, who used his new knowledge to considerable personal advantage after the unfortunate cancellation of the project. However that project was unique within my research domain in that their policy appeared to be to hire promising team members and provide training. The far more frequent situation is to recruit staff that already have the requisite skills, so that the project can benefit from their knowledge without delay. This was typified by the response from my contributor for Project 7, who was somewhat puzzled by the question when I asked if any coaching or mentoring had taken place within her project. The eventual reply was: "I think they hired us for our skills to be able to do what we could do". This finding confirms what I have usually observed in practice: projects rarely make any provision for formal training or coaching, and learning (if it is considered at all) is expected to take place informally.

7.2.3 Situated Learning

It was apparent that the majority of researched projects presented opportunities for situated team learning. All the teams met the basic criterion of commonality of purpose, but it was less clear if the members met Senge's (2006: 220) other three elements:

- A preparedness to work closely with others
- A willingness to share information with others
- A readiness to contribute to team dialogue, discussion and decision-making

In the course of my research I framed some of my questioning to draw out this information, and I gathered a variety of responses. There were several instances where respondents described situations where their teams contained dysfunctional members who had not bonded well. For example, the project manager from Project 19 observed:

> *We have got some personalities in the team. The real technical people don't want to socialise, they like to stick to themselves. There was one key person who didn't want to communicate at all. He was happy to work on his own... he is extremely intelligent, our chief architect. He was a key part of this implementation, and he wanted to work on his own. But we needed to know what he was thinking.*

In another example, one of the key members within Project 16 was a strongly individual character who preferred to work in isolation from his colleagues, as his manager recounted:

> *...He is a bit of an enigma, so to speak. He speaks his mind very quickly, perhaps too quickly sometimes. You've just got to work within the framework, and give him things to do that he is happy to do, and he won't rock the boat.*

Circumstances such as this were not uncommon, and are perhaps indicative of some individuals' perceived need to preserve their specialist knowledge in order to maintain their value in the project marketplace. This is an important differentiator between the project team (often relatively short-lived) and the functional team operating within an organization. In these (and other) examples the leadership was obliged to devise methods to bring the resistant individuals into the project fold, or at least minimise any dislocation they might cause. It appears that the need to manage awkward staff is an important consideration within the IT project landscape. The success with which this is accomplished is no doubt a contributor to the learning that may take place within the team. At least half of all my contributors described measures that were introduced to

foster strong team relationships, as discussed in the previous chapter. However it is unclear whether such actions were undertaken in order to encourage knowledge sharing and active contribution to decision making, or simply to make the project experience more enjoyable.

There were accounts of some notable team learning that took place within the project situation. Project 1 was a valuable learning experience both for my respondent (the project manager) and his team. The project manager seems to have been considerably more knowledgeable than many within his organization, and he gathered around himself a relatively inexperienced team. He organized the team into an effective unit and ultimately led them to a successful outcome. He painted a picture of himself as an energetic leader who led from the front. The team certainly appeared to have learned from the experience, as the PM commented:

> *They got a lot of experience in terms of running projects. These guys had never been part of a formally run project before – with a formal structure, requirements gathering, design, testing, rollout, and all that kind of thing. They gained experienced in dealing directly with the user population...the guys that were involved do not typically get involved at that level of the business, so it was quite an eye-opener for them....*

The same PM espoused a fairly uncompromising approach to leading his team; he had a clear vision of his objective, and he shared it with the other members in order that they understood the direction. However his vision was not really negotiable, as he commented:

> *Yes it is important...to have a team that knows what the grand picture is. We want to know where we are going and what route we are taking to get there. The only way to get there is to talk it through with them. It's part of the process of developing the route. I knew which path I wanted to take anyway. I pretty much painted a picture for them, but I wanted them to draw their own logical conclusion that the path I wanted them to go along was the logical one. It was a bit sneaky...*

The team involved in Project 18 also seemed to develop quite markedly as the project progressed. Again it was a situation where the leader possessed considerably more experience than the team, and the project was operating under pressure. The team rose to the challenge, as the PM described:

> *My project team started out with two key [people], and a whole bunch of newcomers. The new people had no idea about the legacy system, had some idea about the work involved [and] the coding language being used, but at a*

very junior level. Those guys, all of them, have worked so hard to understand the legacy system and to do the development and design work. They are a team which has quite surprised me...Right now we are probably working at a level that we didn't expect to reach for another 12 months,

These are two examples where there were specific indications that situated team learning took place. It is not implied that team learning was absent from the other projects, only that the evidence was less well defined. Within the other projects there were doubtless team differences to be worked around and accommodated in the interest of delivering an outcome. The probability is that all the teams learned to an extent and developed effective ways of working.

7.2.4 Progressive Reviews

A number of projects were subject to progressive reviews, which seems in most cases to have yielded significant value. These are a development of the more commonly used Post Implementation Reviews, and are conducted in much the same way. The obvious advantages include, firstly that the project personnel are all still involved and available to provide input, and secondly, that the lessons learned can be immediately recycled for the benefit of the project. One of the projects that was reviewed several times during its life-cycle was the troubled Project 6. In this instance the vendor became seriously alarmed by the budget overrun and initiated regular appraisals in order to monitor progress. The lessons that emerged are believed to have been acknowledged and actioned by the vendor organization, as the interviewee observed:

We've already done three project reviews. We've already called in the account management and done an analysis of what went wrong. The budget was so far out that it got alerted. As soon as a project goes red it gets alerted anyway. So we ran an immediate review of what went wrong, and what we needed to do to fix it. So all those lessons learned have been captured by the service delivery assurance people. They basically review the whole thing and say, don't ever do this again...So, that type of knowledge is captured, and they are very aware of it.

In the case of Project 6, the organization that benefited from the review was the vendor and not the sponsor. There was no report of any review by the sponsor, and the interviewee was very disparaging of the sponsor's ability to learn usefully or to improve their project performance, as he commented:

As regards lessons learned, there were lots of them...the checking and the auditing that we normally wrap around these things simply wasn't there...it was driven by the account management because it was needed quickly. I

> *didn't read the contract initially well enough. Unfortunately all the learning was on our side, and I don't think the customer has learned anything.*

Another example of a distressed project that was regularly reviewed was number 14. This was the reverse situation where the sponsoring organization implemented ongoing reviews because of the poor performance of a vendor. The project was becoming embarrassingly overdue and the sponsor initiated regular appraisals in an attempt to rectify the poor quality of the work delivered by the vendor, as my respondent recounted:

> *Because of the problems on this project I have actually done [reviews] along the way. I have put together documentation about the problems for our senior management. For this one, we didn't wait. I think sitting down and reviewing all the problems part way through a project, or at the end, is valuable. Where I haven't seen the value, is them taking that and fixing the problems so that they don't occur the next time. At the moment I haven't seen any evidence that problems we have pointed out back in January have been fixed, or that there are any plans to fix them.*

In this case the reviews were used as a lever to attempt to improve ongoing performance, but it appears that the vendor organization was resistant to learning any new or improved techniques and the project was continuing to suffer.

Project 22 provided an example of a successful project that used regular reviews to enhance ongoing performance. The undertaking consisted of 20 different phases delivered progressively over two years, and the leadership put in place a rigorous programme of reviews:

> *For every sub-project, at the end, all the people involved including the stakeholders sat down and we did a post-implementation review. We said: this might be difficult, this might be embarrassing, but what did we do well, what did we do badly, what were the stuff-ups and what were the lessons learned. The steering committee insisted that we see every PIR. It was just something that was done. The lessons learned in the first few months from the sub-projects were passed on, and we got better and better and better.*

The leader of Project 22 was adamant that his regular reviews were extraordinarily valuable, and that his project benefited substantially as it progressed.

The only other project to have used a progressive review was number 20, and that was the result of chance. The project had a two month break imposed upon it by the sponsor, and the team took the opportunity to review and improve all their processes, which was found to be very beneficial when activities recommenced.

The remarkable aspect of progressive reviews is that they are so uncommon. Within my research group, only four projects made use of the technique, and two of those were forced into it by adverse circumstances, and one other by accident. It appears to be such an obvious aid to ongoing learning and performance improvement, and yet rarely employed in practice.

7.2.5 Dialogue and Creative Abrasion

The creation of an open and inclusive project environment in which every viewpoint is welcomed and valued does not happen automatically, and is not always afforded a high priority. The researched projects exhibited a wide range of receptiveness to open participation by all team members, with the majority sitting squarely in a middle ground, as will be shown. At the most open and receptive end of the scale, the best example was Project 20. It was organized as a very flat structure, with a considerable number of mature hand-picked specialists reporting to a very experienced project manager, and the open and inclusive model functioned very successfully in that instance. On the opposite side, Project 4 by contrast was organized hierarchically and communication outside one's immediate reporting line was discouraged. This project employed numbers of quite junior people and this was reflected in the structure. The interviewee from Project 4 held the opinion that many of the team members would not have had the maturity to contribute to an open forum and might have been intimidated, however the rather rigid structure also constrained the more experienced people who had more to offer.

The most frequently occurring team paradigm seemed to be a strong leadership, with notional open debate, and decision-making concentrated largely in the hands of the leadership. This was typified by the leader of Project 1 who was prepared to engage his team in discussion, but quite candidly declared that he made all the important decisions and was disinclined to be swayed by input from his team colleagues. This pattern of team dynamic seems to have been driven by the weight of responsibility upon the leadership: the need to deliver against an unforgiving set of requirements outweighed the inclination towards democratisation. Also there was a marked tendency for the non-leadership respondents to expect to be led: if the leadership was recognised as competent (as was mostly the case) then there was a belief that the decision-making should reside there. In summary, although most project teams were effective and

functional, they were far from optimal in terms of the team learning model that the literature informs us we should strive for.

There were two projects that merit special mention in this context, numbers 5 and 20. Both projects resided in the type 4 quadrant: both were concerned with major change to business processes and were politically very sensitive. These were difficult projects to manage, both strategically and tactically, and in both cases the project leadership seemed very enlightened. Because of the uncertain nature of the projects they were appropriate vehicles for improvisation, and therefore had very powerful learning potential.

Project 20 was the larger and more ambitious of these, and illustrates well the benefit of the creative and open approach. It was staffed by a team of experienced specialists, many of whom appeared capable of making important decisions in their own right. There was a sense that there was a robust dialogue taking place that was driving the project very effectively (at the time of the interview the project had been flourishing for three years and was still delivering). Consider this comment from the technical specialist within Project 20:

> *There were certainly strong characters in the project team. My point of view was not always agreed with, that's certainly the case. It could happen in a few different ways that my argument might not win the day. But I never felt that didn't mean that I wasn't welcome or wanted back at the table the next day. I do feel that sometimes my point of view did win the day, or did change their minds, and hopefully none of those will come back to bite us!*

This comment indicates a confidence that was not exhibited by any other specialist that I interviewed. He was quite prepared to argue his case on major project issues in a robust forum with other well-qualified people, and was ready to accept the outcome whether he won or lost. The strong characters mentioned may well be the product of the fertile learning environment that appears to have developed. This is probably the closest example that I observed to the phenomenon of creative abrasion, and it certainly seems impressive as a driver of learning. The results over a sustained period of time suggest that it may have been a most effective contributor to the success of that project team.

Based on my research a number of factors need to be present in order for creative abrasion and/or effective dialogue to be employed usefully within a project team. The project must involve some uncertainty in terms of methods or objectives; the leadership

must be sympathetic to the notion of sharing power; and the team members must have sufficient level of maturity and confidence to want to be part of the decision-making process.

7.2.6 The Project as a Community of Practice

There is evidence that one project in particular functioned as a form of emergent community of practice. The project in question is number 20, which seemed to correlate to a COP in several tangible ways. In the first instance it appeared to meet Sense's (2003) minimum set of criteria, in that the team comprised a community with a common concern, each member had a mutually defined identity, and it existed for a substantive timeframe. The last criterion is usually the disqualifying one for a project, but this undertaking was most unusual in that it was in its fourth year at the time of the interview. As previously recounted, the team included a number of seasoned professionals who interacted effectively and robustly, and there seems to have been a healthy exchange of knowledge. There were also some cultural practices that had developed, to reinforce the clear notion that this project considered itself "special". The interviewee described how the practice was always to wear a shirt and tie as a form of differentiation from the other IT groups within the organization. He also described how he had mentored some newcomers to the team, saying: "I did mentor some younger people, and in a few different ways. Not just at the technical level, but in how to work in this team, and how to express your opinion". The second sentence speaks eloquently about how the project team viewed itself and how it sought to communicate its heuristics and culture.

The interviewee from Project 20 was undoubtedly highly motivated by the achievements of his team, and seemed to be proud to be part of it:

> *The PM has developed a very dynamic and successful team. There is a certain level of dynamism to this whole project, and there is a need to be flexible at all times and in all circumstances. That is understood and endorsed by those people who put this team in place.*

It would appear that as an example of a learning team, this project is an outstanding example. Owing to its long duration and complexity, the leadership has developed a formula of devolved responsibility that has sustained its ongoing success. One has to admire the inspired leadership that has enabled this community to develop and prosper.

7.3 Knowledge Transfer into the Organization

There were some difficulties in establishing any positive evidence that an organization had learned effectively in any long-term sense from the project in which it had been involved. In some instances the interviewees were contractors who moved on before it was apparent that any of their knowledge had been passed on. In other cases, there were deliberate attempts made to transfer knowledge but the effects were not always clear. However there was sufficient informative data to enable the construction of some understanding about how organizational learning from projects takes place. Firstly there were indicators relating to the organizational culture, or mental model (Senge 2006). Secondly there were the actions emanating from within the project to provide knowledge and learning into the organization; in most cases these actions took the form of a stakeholder review. Thirdly there was the provision by the organization of the means to receive and utilise the knowledge; usually by means of a project management office or equivalent. My interpretive summary of the organizational learning that took place as a consequence of the project activity is presented in Appendix 7.

7.3.1 The Corporate Mental Model

There were numerous indicators provided by the interviewees of the nature of the culture of the organizations in which they were working. The cultures encountered, and their attitude towards facilitating project learning, varied between extremes. At the more resistant end of the scale there was to be found a number of the sponsoring organizations, and at the more receptive end, some of the vendor organizations.

There were two examples where organizations appeared to have no interest in retaining any of the learning that emerged, or was available, from their implementation experience. In these cases the project was perceived as a one-time only endeavour and the business leadership was content to accept the outcome and say farewell to the team. This was certainly the case with Project 2 (the manufacturing company) and Project 11 (the recruitment company) where they retained only basic in-house IT expertise, and did not recognise the need to acquire or understand the skills needed to run relatively large-scale projects which they perceived as infrequent occurrences. From a business standpoint it is difficult to argue with that position. Both organizations seem to take the view that when they require such expertise they simply hire it. This is evidence again of Cross's (2007) theory that much personal value lies in having contacts: on the

organizational side knowing reliable people to hire, and on the provider side building a network of those who require one's specific skills.

There were several examples of substantial sponsoring organizations that displayed a very casual approach to learning from the projects that they had funded. The government and semi-government bodies in particular, seemed quite unconcerned about improving their project practices. This relaxed attitude was not confined to the public sector: the large private sector organizations involved in Projects 21 and 24 were also apparently quite oblivious to the potential value that they allowed to escape at the conclusion of their projects.

Amongst the sponsoring organizations there were five examples where there seemed to be a genuine receptiveness to the acquisition of new knowledge, and each demonstrated a clear intent to improve proficiency in improving project delivery. These were all private sector corporations, each one a well-recognised name, and all engaged in regular project activity. There was also a tendency to include numbers of permanent staff in their project teams, which provided the benefit of maintaining some continuity between projects.

The vendor organizations demonstrated a more consistent approach to learning, and this is understandable because project delivery is frequently a major part of their business, and their reputation depends on their perceived reliability. The larger vendors employed recognised methodologies and had an identifiable project culture of working long hours and meeting deadlines. Their approach included regular reporting to a central office, and attempts to capture feedback and improve practices. The smaller vendors exhibited more flexibility of approach, but certainly appeared receptive to opportunities to maintain and upgrade their performance.

7.3.2 Organizational Absorptive Capacity

There is evidence that organizations that have repeated attempts at implementing systems eventually succeed. In the five reported instances where projects were reprises of earlier efforts, in each case the project succeeded. It appears that the organizations learned from their earlier endeavours and developed a conscious mindset to ensure improved outcomes. Of the five repeat attempts at implementing the required system, four of these five projects were able finally to deliver a successful outcome. The fifth of these projects (number 7) was accepted by the organization although my assessment

was "challenged" for reasons of late delivery. In the case of Project 7 the respondent believed that the undertaking had been attempted three or four times before; the project had a duration of greater than two years and was considered to have been "very difficult". It would appear that on this occasion the business champion had determined unequivocally that the system must be installed and would provide sufficient momentum to ensure its success. The interviewee commented:

> *We had a very good business owner. This was something that he had been trying to get through for a number of years, and I think this was his third or fourth attempt. He was very motivated... he was the champion. By the time we got to the development stage, he and one of the guys that worked for him were with us all the time, and sat next to us, and answered all the questions, and resolved all the issues. And they would liaise with the big organization for us, and use all their networks and politics that they needed to go through.*

In this instance there seemed to be at least three factors driving the project: the organization was under substantial competitive pressure, the business champion had a legacy of three failed attempts behind him and was motivated to succeed, and the same champion appeared to have learned that he needed to be personally and closely involved.

Project 8 was a large-scale and complex implementation of an Enterprise Resource Management (ERP) system, and the organization had twice suffered the embarrassment and expense of failed attempts. At the third iteration, the business decided that failure was not an option, as recounted by my respondent:

> *They sat down extremely strictly at the beginning and said, this is what we are going to build, this is how we are going to do it, and these are the flows that we are going to follow. I looked at all this, and I thought, wow, these guys know what they're doing. Plus, they also had the best guys. Everybody you went to from the software person to the warehousing person to the sales and distribution person, they were all the best ones they could find. This was because they didn't want the project to fall apart again.*

As in Project 7 there was a champion from the business who had experienced the previous setbacks, and it appears that this time he was focused on success. Under his pressure the organization invested in the best resources that they could find, including a highly experienced project manager. Detailed plans were developed and the project manager controlled the undertaking strictly and sensibly, with absolute adherence to deliverables and timelines and on this occasion the result was successful. It would appear that in the instances described the previous failures had created an organizational memory that enabled the avoidance of past mistakes. This is substantiation of the

theory of organizational absorptive capacity in which a firm's accumulated prior knowledge assists in the exploitation of new knowledge (Cohen and Levinthal 1990). It has also been observed that the more deeply the lesson is learned, the more effective is the subsequent retrieval. As succinctly noted by Mant (1997: 162), in the world of civil engineering "You can't help but learn something if a bridge falls down".

7.3.3 The Post Implementation Review

The post implementation review (PIR) or post project review (PPR) is a key element in the propagation of knowledge into the wider community, for the benefit of future (or current) projects and the wider organization. Only 10 out of 24 (42%) were subject to a post implementation review, but this figure must be qualified because in three cases the interviewee "believed" that a review had been done, but had not personally contributed to it. In each of these three cases the respondent had rapidly moved on to their next assignment, and was not available to provide any input.

There were three instances where PIRs were conducted and significant ongoing benefit was claimed. Perhaps the most impressive of these was Project 3 in which my respondent declared that the project had generated substantial improvements to their overall practices:

> *We formalised the documentation to be produced by all project managers, we formalised the documentation to be used for requirements and we formalised the methodology and tools to be used for testing. [Our project] was able to show really good results from using a very formalised and structured approach...the experience flowed in to the creation of the centres of excellence.*

This is certainly an impressive set of benefits and this project seems to have been particularly influential. The system was business-critical and delivered successfully, and the organization appears to have been culturally receptive to learning.

Project 22 was notable for its highly experienced and professional leadership, and as a matter of course, a final review was conducted at its conclusion. This resulted in a number of lessons learned that were presented to the executives of both sponsoring organizations. The list of fourteen lessons learned is shown in Figure 7.5, edited slightly to remove the organization names. The list could well serve as the distillation of the essential high-level elements required to manage a complex long-duration project. My respondent commented on the PIR:

It was signed off by the steering committee and the execs on both sides. In there you have got the top contributing factors to success at the exec level. That was institutionalised in both organizations. I've never been back to [either organization], so have the lessons learned really been learned? And did your next two or three major projects pick up the key lessons from this, other than by word of mouth or because one of the guys from this project has moved on to the subsequent one? At the end of the PIR there are testimonials from the two CIOs. It was a huge success, which of course a lot of IT projects are not... I really don't know whether those lessons have been learned.

The key comment is the final one. PIRs may be conducted with the best intentions, and in a spirit of total professionalism, but evaluating the ongoing benefit is problematic.

Lesson	Details of Lesson Learned
1	Very Strong Governance Model developed and adhered to. Five forums, meeting on a regular basis, provided issue management and problem resolution as well as a regular operating rhythm.
2	Joint planning, reporting, issue/risk tracking and dependency processes
3	Clear separation and resourcing of migration and BAU streams
4	Program vitality checks – Joint Health Checks, PIRs – actions identified and tracked to completion. The governance structure and the health check processes enabled ORG1/ORG2 to devise early strategies to minimise the impacts of any "What didn't go well" issues.
5	The high priority and funding afforded the Project by the stakeholders
6	Stream and Programme based joint Project Management Practices
7	The clarity and buy-in afforded by the Business Requirements Process
8	Use of multiple dry–runs and repeatable IT solutions
9	Dedicated Service Provider team and governance tailored to project requirements
10	Excellent teamwork and effective communications
11	Right blend of SME staff and specialist contractors
12	ORG1 and ORG2 project environment – divorced from standard bureaucracy
13	Focus, motivation & dedication of ORG1/ORG2 project staff & key partners
14	Security and operational protocols mutually agreed at start of project

Figure 7.5: Project Lessons learned from Project 22

There were some notable instances where large organizations, with substantial IT operations, apparently made no attempt to capture any lessons learned from projects that they sponsored. Project 1 took place in a large semi-government body which appeared to be quite lacking in project skills, but there was no real interest from the management in acquiring any understanding of the way in which this successful project was brought about. The project leader commented:

> *[The PIR] is something that I kept raising and I wanted to do. I kept raising it and saying the project isn't finished until I do one. I do not think the management held the same view. I guess they appreciated the importance, but they never allocated the time needed for me to do it.*

This coincides exactly with the findings of Williams (2007) who noted that time-pressure was one of the principal reasons for PIRs to be neglected. The attitude of the management was no surprise to my respondent who also said: "the organization doesn't have a culture of learning. In fact, quite the opposite". Shortage of time at the end of the project was also quoted as the reason for the omission of a review for number 17, which was again a large government body that would surely have benefited from the new knowledge generated by the successful delivery of their very substantial project.

7.3.4 The Project Management Office

A major disappointment within the research has been to discover the relative insignificance of the project management office (PMO). The primary role of the office is to function as a provider of project standards, a repository of project knowledge, and the means by which lessons learned can be made available to subsequent project teams (Kerzner 2004). The potential of the PMO as a catalyst for improved project learning has been recognised for decades, but within most sponsoring organizations the function (where it exists at all) seems to be neither particularly influential nor consequential. My respondent in Project 17, who represented the vendor, made this comment about the sponsor's PMO:

> *A lot of the processes developed by the PMO never got used. There were written procedures signed off and agreed, but actually getting them into use was a different matter. So they went to all the trouble of setting up the PMO and getting all the processes and procedures in place, but then they didn't follow them. So that really was a waste of time...They had a requirements manager in there who documented everything using Rational software. Trouble was nobody else knew Rational, so nobody could figure out what he had done.*

This seemed to be rather typical of the attitude towards the PMO: they were perceived as rather bureaucratic and an obstruction to be worked around rather than a valuable additional project resource. In this respect the Australian experience is consistent with the overseas observations of Norrie (2008) and Julian (2008).

There were, however, two honourable exceptions where the researched projects made major contributions to future standards promoted by the PMO. In both instances (Projects 3 and 19) the PMO appears to have been somewhat immature, and the projects were considered to be highly successful: consequently the methods they employed were adopted for use by future projects. This was explained by the project manager for number 19:

> *Part of my role has also been to develop processes as part of the project management office. Anything I do here becomes a process. So now we have the RFP process, we documented that and we are using it somewhere else. We are using all my work that I have done over the last three years to model processes for the future. There are a lot of angles in the work that I do, and one of them is also to develop processes...and also to showcase the importance of the project management office. So success is very important. We don't have authority to enforce our processes, so we have to do it by showing how it's done.*

Both these projects seem to have been very influential in bringing new knowledge out of the project situation and into the wider organization. The contexts were similar: the projects were successful; the standards and models they used were seen as effective and re-usable; and the organization was receptive to the notion of learning what had been achieved for the benefit of future projects. However only two sponsoring organizations out of 24 seemed to be sufficiently concerned to adopt this constructive approach, which is an unimpressive endorsement of the PMO concept.

7.3.5 Business Champions

The business champion featured quite prominently within a number of the projects, and there was evidence that these individuals, whilst representing the interests of the organization, were receptive to learning opportunities provided by IT projects. There were three reported instances (Projects 7, 8 and 11) where the respective business champions, having steered projects to a favourable endpoint, promptly moved on to other opportunities. There are a number of inferences one can draw from this: the least complimentary being that there may have been a residual fear of the project failing to deliver as promised. However, since all three projects were reportedly successful, it is

perhaps suggestive that the experience gained in championing a project is a recognisable skill and increases the value of an individual in the marketplace (Cunningham et al. 2004). It seems that the propensity to gain the benefit of project learning at the expense of the organization is confined not only to IT practitioners (and contractors in particular), but also to the executive ranks.

7.3.6 Explicit Knowledge Creation

The creation of explicit or documented knowledge related to projects seemed to be a rather contentious issue, and its value in the learning process rather uncertain. Several of the respondents declared quite unequivocally that they consider it to be of little value, and that they prefer to utilise their scarce resources in more productive ways. One of the arguments is that the most important aspects of project work, such as tactics and decision making processes, cannot be codified. This is consistent with the views of Cross (2007) and Senge et al. (1999). Another argument used to justify this position is that explicit knowledge rapidly becomes outdated and requires an ongoing resource to maintain it, and, to quote my contributor number 16: "Out of date documentation is just as good as no documentation".

Within five of the projects a major investment was made in producing high-quality comprehensive documentation, and in three of these cases the respondent doubted if the material had been updated in line with system and process changes. This failure to update the information casts into doubt the value of the investment. Other comments suggested that project material was frequently filed very haphazardly and could never be located or usefully accessed with search tools. There can be little excuse or justification for this; it appears to be a symptom of the topic being afforded scant priority.

The most frequently adopted position within the researched projects was the claimed "sensible minimum", in which a reasonable set of specification and end-user documentation was produced, but the size of the investment was contained.

When the management of project artifacts is appropriately addressed, there seems to be significant benefit. The contributor from Project 8 was very enthusiastic about the knowledge repository operating in that situation:

They were using a software package called Solman, and if you wanted to find anything, it was on that system. If you needed any training, it was on that system, if you needed anything, it was on that system.

Project 8 appeared to be the only instance where such an easily accessible repository had been established, and it would seem to have been a very valuable resource. It is surprising that this practice was not more widely embraced.

7.4 Summary of Project Learning

The process of hermeneutic interpretation yielded a rich understanding of the many different facets of the project learning phenomenon. Despite individual contributors frequently having an uncertain recognition of their own learning, the phenomenological research technique enabled the construction of an image of each project experience which was enriched through the hermeneutic process. At the individual level a wide range of learning experiences has been extracted and analysed. Where the project involved a challenge which the participant was sufficiently motivated to engage, a positive learning experience resulted. Projects involving a high level of stress presented particularly powerful learning opportunities. On the reverse side, where projects presented a challenge that was outside the participant's frame of reference, and the motivation to revisit or transform the mental model was absent, then learning was inhibited. The research also highlighted evidence of absorptive capacity, where the more experienced practitioners were able to acquire new skills faster and with less stress than those less practiced. At the team learning level, there were examples where teams had bonded into effective learning units, and one specific instance where dialogue and creative abrasion appears to have been employed successfully. Within the majority of teams there was found to be opportunity for open discussion and debate, but power sharing was limited, and decision-making largely centralised. As regards the transfer of project knowledge into the wider organization, there was a problem in establishing whether firms had learned effectively in any long-term sense. In some instances there was a corporate mental model that placed no value on the retention of such knowledge. In other cases, the knowledge was known to be valuable but the transfer of information, by means of review or into a central office, was simply given no priority. There was evidence of organizational absorptive capacity: in several cases projects were reprises of previous failed attempts, and in each instance there was sufficient corporate memory to ensure success at the subsequent attempt.

CHAPTER 8: THESIS CONCLUSION

8.1 The Third Frontier

The take-up of computers and technology has been faster and more comprehensive than anyone could have imagined. In my four decades in the industry the changes have been literally incredible. When I was working as an assembler-level programmer on early mainframe computers I could not have imagined that I would be one day sitting before my own home computer, which cost only a couple of thousand dollars and with many times the power and capability of a mainframe. What is more pertinent to this thesis, is that nobody could have imagined how difficult it would be to implement systems to make the best and most effective use of the technology that we have created. As technology develops at an increasingly rapid pace, the opportunities that are presented expand commensurately with the expectations upon the IT community to deliver effective solutions that incorporate it.

One of the many words within the information technology lexicon is *peopleware*. It was coined as a term to refer to one of the three core aspects of computer technology: hardware, software, and peopleware. It is a rather contrived word, but it encompasses anything that has to do with the human contribution to the development or use of computer technology, including such elements as individual productivity, the psychology of programming, teamwork, group dynamics, project management, and relationships with the wider organization. The history of information technology has progressed through three distinct phases, as summarised by Constantine (1995: xxii), and paraphrased by me:

> *Peopleware is really the third frontier of the computer revolution...at one time we thought our problems were really due to hardware. Well, we got better computers...and our problems persisted. So we concluded that the real problem was software...on the heels of the structural revolution that gave us structured design and analysis, object orientation began to mature and gained in popularity. Still, schedules kept slipping and budgets kept busting. Peopleware is the real issue. We are the problem and the solution.*

Although these words were written fifteen years ago, they still hold true. Across the wide range of projects that I have researched, in no instance was there any apparent failure of hardware or software technology. The difficulties, delays and failures were all due to people. This was the most profound realisation of my research: understanding

how projects function is about understanding people, and how people interact with each other. My contributor number 19 had just completed a gruelling 13 month project and was in a state of euphoric exhaustion, and summarised his experience with the following: "The way that projects are done…is by influencing, by having relationships".

The creation of strong relationships, both with the project's external stakeholders and within the team itself, builds the trust and confidence that are essential if the project is to prosper. Where there is trust and confidence, the project will feel empowered to take the risks that are required to drive it to a successful conclusion. As my research has shown, the confidence to take risk is the single most powerful initiator of new knowledge and creator of learning opportunities. Where relationships are less robust, the confidence to reassess personal frames of reference may be limited, and an aversion to risk may be manifested. When projects encounter difficulties, as they inevitably do, there may be a need for improvisation and experimentation. This cannot be undertaken without some element of risk: with a reluctance to take risk, project performance may be impacted and no new knowledge will be generated.

8.2 Researched Project Outcomes

While this is not a major objective of the thesis, it is interesting, and indeed almost irresistible, to attempt to assess the outcomes of the projects researched. This must be prefaced by a considerable measure of caution, because there is inevitably substantial subjectivity involved in any such assessment. In the first instance there were a number of potential candidates who declined to be interviewed for reasons unstated: this may be an indication of reluctance to discuss projects that were severely challenged to the point where recollection was distressing; or it may not indicate anything significant at all. During the course of the interviews, the interview subject's own assessment of the project outcome invariably became clear. Sometimes this was based on reference to known success factors, and in other cases founded on personal estimation. I then overlaid this with a second level of subjectivity, which was my approximation of project success grounded on the hermeneutic interpretation that I applied across all the units of interest that emerged. The results of my estimation of outcomes are provided in detail in Appendix 4, and summarised here to provide a point of comparison with the figures that I used in the introduction:

Project outcome	1994	2006	This research
Successful %	16	35	46
Challenged %	53	46	42
Failed %	31	19	12
Total	100%	100%	100%

Figure 8.1: Assessing Project Outcomes

The comparison with the year 2006 is apposite, because it falls squarely into the average year of completion of the researched projects. My research therefore produces figures that are rather better than those published in the Standish report, but they are sufficiently close to support my intention of gathering a wide range of projects that are recognisably representative of the industry norm.

The Standish Group have now released the results of their most recent IT Project survey for 2009, and the figures are actually worse than for 2006, with only 32% of projects being declared successful ('The CHAOS Summary' 2009). In spite of the efforts of organizations such as the PMI (Project Management Institute), the many proven methodologies that are readily available, and the large volume of published material on the subject, there is a disturbing and ongoing propensity for fewer than half of all IT projects to be delivered successfully.

8.3 The Relationship between Learning and Project Success

My research suggests that failure to learn is undoubtedly a factor in our relatively unimpressive ability to deliver information technology projects successfully. The failure occurs at three levels. At the individual level, there may be elements of risk-aversion that discourage effective learning. At the project team level, there may be a tendency to inhibit initiative and learning though absence of effective dialogue and failure to share decision-making, in other words a failure to make the best use of scarce project resources. Importantly, at the level of the organization there is a marked and disturbing propensity to allow invaluable project knowledge to escape unrecognised and unrecorded. I believe that each of these three factors is inhibiting, in different ways, our ability to deliver projects consistently and meeting all required outcomes.

However, my research also suggested there are other significant factors that contribute to the difficulties that we experience in delivering successful project implementations. I

contend that a major reason would be the increasing use of offshore and/or widely dispersed project teams. Based on my research these create considerable problems in areas such as effective communications, productivity, and increased project stress. I believe that the practice is also a very effective inhibitor of learning, certainly at the level of the project team and the sponsoring organization. This is ironic because it is the quest by business for cost savings and efficiencies that drives these initiatives. However they appear to make the task of project delivery considerably more prolonged and certainly more difficult. Dealing effectively with offshore providers seems to be a learned skill that is not yet widely possessed, and there is also some evidence to suggest that there may be resistance to acquiring it. The trend to offshore services and widely dispersed project teams is part of the march towards globalisation, and as such is not a negotiable part of the project firmament. Decisions to use low-cost service providers and development teams are frequently made in boardrooms far from Australia, and are a factor that must be accommodated rather than railed against.

Another reason for project distress that was clearly highlighted in my research was an unwarranted faith in the ability of third party vendors to supply solutions. Many organizations recognise their own limitations in the project delivery situation and engage a vendor to provide the necessary expertise. Whilst the vendors can claim to provide a practiced and professional approach, and support from their central resources, employing their services does not guarantee success. The vendor may be hampered by a lack of relevant business knowledge, and they are certainly subject to the problem of a limited talent pool, and often display a disturbing tendency to employ inexperienced staff where seasoned practitioners are required. No single consulting firm has a lien over the best project practitioners, and my belief is that the really talented individuals are spread rather thinly across them. My research produced some examples of poor quality services delivered by vendors to the detriment of the project, and additionally there is anecdotal evidence and an abundance of stories relating to less-than-successful systems delivered by certain consulting houses.

Another problem that persists is the propensity for many in senior management to fail to understand the challenges of the project circumstance. One of the more interesting aspects of my research has been to gain a better understanding of the relevance of defining project type into one of the four quadrants, where type 1 represents lowest risk and lowest complexity, and type 4 represents highest risk and highest complexity. A

very senior executive in a government department volunteered the following during a conversation in mid 2010:

> *I just don't understand the difficulty. I can buy a mobile phone for a ridiculously cheap price, and it works perfectly. Hardware and software combined in a flawless package. But in my industry I can't get my people to implement a decent application system. It takes them years and they still don't get it right.*

He was quite correct in that he absolutely did not understand. The project to develop a new mobile phone would have totally clear objectives and probably also certainty of methods to be employed. This executive's application package may well have been a type 4 project, and may possibly have had a fractured history involving inappropriate leadership, an inefficient vendor and offshore service providers. Until senior decision-makers understand better that projects are not all alike and that they have widely different risk profiles, this problem is going to persist.

8.4 The Learning Organization

The key to improving project performance ultimately lies with organizations. It is organizations that have the needs, provide the funding, and take delivery of the results. The theory informs us that if organizations could be persuaded to learn more effectively, the natural consequence of this would be project teams that delivered timely and efficient solutions.

Where is the learning organization today? In the thirty-odd organizations in which I have worked, none of them seriously subscribed to being a learning organization in the sense proposed by Argyris or Senge. The effectiveness with which they learned to do things better varied widely, and always in a fairly low range between "not at all" to "middling". Such learning that took place tended to be accidental rather than planned, and depended largely on the degree of openness that prevailed within the organization: whether the culture was predominantly friendly and sharing, or closed and secretive. I also observed that the open and sharing nature discovered in some organizations was a fragile entity that soon disappeared in times of financial stress or under the threat of corporate takeover. With the threat of redundancy hanging over them, people tended to withdraw into themselves and protect their knowledge in the hope that their secrets might save them.

The one possible exception to the above was the enigma that was One.Tel. The leadership of that Australian telco certainly attempted to create their own idiosyncratic version of a learning organization, with rather mixed results. That the formula worked in the early years is undeniable. But as the organization grew in an uncontrolled way and financial pressures increased massively, it started to exhibit the same symptoms as I have observed elsewhere. People stopped sharing and started to retreat; meetings became exercises in recrimination and point-scoring. In these circumstances, learning to survive becomes paramount and learning to function better is far down everyone's list of priorities.

Therefore my own limited firsthand experience with learning organizations is that they are short-lived and fragile. Even when they survive for a period of time, they do not necessarily succeed in this global capital world, observed Jarvis (2007: 115) when quoting the example of the ill-fated Rover Cars Group. However the difficulties of implementing learning within an organization do not invalidate the theory. The creation of a fully-functional learning organization is far beyond the horizon for most managers, but the encouragement of openness and knowledge sharing should be within the grasp of most business entities. Organizations that are open and friendly are inherently more enjoyable places in which to work, and more productive as a consequence.

Whether an organization subscribes to being a learning entity or not, it is increasingly important for sponsoring organizations to make better use of the learning opportunities that occur when they sanction a project, because change is constant and projects are going to be necessary more frequently in the future. My research suggested there was a prevalence of the situation where organizations breathe a sigh of relief when a system is delivered, and then release all the contributors and lapse into a state of business-as-usual. With the rate of technological change that is occurring, in the future this may become increasingly unwise.

8.5 Effectiveness of the Research Process

My strong belief is that the selection of a phenomenological approach to the research was both correct and effective. The internal experience of a project can only be expressed subjectively by a deeply involved individual, and to understand that experience requires an efficient method of capturing the subject's recollections, anecdotes, and musings. The phenomenological interview, with its basis in openness

and empathy, enabled access to this rich source of qualitative information. The interview was supplemented by some concrete facts derived from the profiling questionnaire that enabled each project to be quantitatively positioned within the body of the research. The interview was guided by judicious use of a checklist that enabled a consistency of the material to be drawn out. The only drawback with the research method is that conducting the phenomenological interview is very much an acquired skill. I have already made reference to the improvement in my technique that took place; the early interviews lacked some of the depth and richness that I was able to glean later when I was conducting my questioning more fluently and more expertly.

Similarly I believe that the hermeneutic interpretation process functioned effectively in enabling the building of a picture of each project as it was perceived by the individual. I was able to gain an understanding of each subject's project experience, and derive constructive insights into the new knowledge that they had acquired. Using the hermeneutic circle to analyse each transcript, and thinking deeply about each project situation, I generated my interpretation of each individual's learning outcomes which form the basis of much of this thesis.

The aspects of the research that produced rather less comprehensive results were those related to learning within project teams, and learning at the organizational level. There were some clear insights and indicators of this collective learning and these have been explored and analysed in the thesis. However it was apparent that in order to do full justice to these important aspects of project learning, it would be necessary to undertake further research employing a different approach. There would be two ways that I might address this, either by conducting separate phenomenological interviews with several members of the same project team, or by immersing myself in an ethnographic study in order to observe the learning at first hand. However my research produced some interesting observations into shared project learning, and has, I believe, made some contribution to understanding this phenomenon.

8.6 Finale

I am deeply indebted to my 24 research respondents who gave me their time and provided me with so much frank and honest input from which I have constructed this thesis. It is impossible not to be sincerely impressed by the general level of diligence and planning and ingenuity that was demonstrated by all the project participants. The

fact that their efforts do not always yield totally favourable results is a consequence of many factors, some of them beyond their immediate control. That 88% (21 out of 24) of my researched projects ultimately were delivered (albeit some of them late or deficient) is evidence that most project teams work together sufficiently effectively to produce a result. Whether they are learning or working optimally is, I hope, made clear within the thesis.

Interestingly, there is an increasing body of opinion that declares that there should be no such concept as an information technology project (Lewis 2010). There should only be business improvement projects enabled by technology, and IT should be perceived as a partner within the business rather than a mere provider of services. Certainly, the rather artificial barriers that we have erected between "IT" and "the Business" (be they physical, social or mental) serve only to hinder rather than enhance the project process. If this concept continues to develop then there are great possibilities for the eventual merging of the boundary between the two sides. I suspect this discussion has a long way to run.

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APPENDIX 1: SUMMARY OF PROJECTS RESEARCHED

Subject/ Project No	Role	Viewpoint	Contract/ Perm	Male/ Fem	Industry	Project Class.	Size Rating
1	PM	Sponsor	Cont	M	Health	Infra-structure	medium
2	BA	Sponsor	Cont	M	Manuf.	Custom dev.	small
3	BA	Sponsor	Perm	F	Financial	Custom dev.	large
4	Tech	Sponsor	Perm	M	Transport	Infra-structure	large
5	PM	Sponsor	Cont	F	State Govt	IT Info Security	small
6	PM	Vendor	Perm	M	Federal Govt	Infra-structure	medium
7	BA	Vendor	Perm	F	Financial	Custom dev.	large
8	BA	Vendor	Cont	M	Manuf.	Package implement	large
9	Dev	Sponsor	Cont	M	Telco	Custom dev.	small
10	PM	Sponsor	Perm	M	Telco	Package customise	Large
11	Comb	Sponsor	Cont	M	Recruit-ment	Infra-structure	small
12	Arch	Sponsor	Perm	M	Transport	Package customise	medium
13	Dev	Sponsor	Cont	M	Transport	Custom dev.	Medium
14	PD	Sponsor	Perm	F	Transport	Custom dev.	medium
15	Comb	Vendor	Perm	M	Market-ing	Custom dev.	small
16	Comb	Vendor	Perm	M	Transport	Package customise	small
17	PD	Vendor	Perm	M	State Govt	Package customise	Large

Subject/ Project No	Role	Viewpoint	Contract/ Perm	Male/ Fem	Industry	Project Class.	Size Rating
18	PM	Vendor	Perm	M	State Govt	System migration	Large
19	Comb	Sponsor	Cont	M	Media	Package customise	Large
20	Tech	Sponsor	Cont	M	Financial	Process Offshoring	large
21	PM	Sponsor	Cont	F	Retail	Custom dev.	medium
22	PD	Sponsor	Cont	M	Financial	System migration	large
23	BA	Sponsor	Perm	M	Financial	Custom dev.	medium
24	BA	Sponsor	Perm	M	Pharma-ceutical	Package customise	large

Key to Role types:

PM	Project Manager
BA	Business Analyst
Tech	Technical specialist
Dev	Program developer
Comb	PM combined with technical contribution and expertise
PD	Programme Director
Arch	System Architect

Note: Interview transcripts are included on the associated CD.

APPENDIX 2: PROJECT DESCRIPTION AND TYPE

Project No	Classification	Description	Primary Type	Secondary Type
1	Infrastructure	Merge network domains & upgrade hardware	Q1	
2	Custom dev.	Custom development of MRP system	Q3	Q4
3	Custom dev.	Custom development of retail banking system	Q3	Q1, Q4
4	Infrastructure	Global centralised help desk	Q1	Q4
5	IT Info Security	IT Information Security to AS27001 standard	Q4	
6	Infrastructure	Redesign government communication network	Q1	Q4
7	Custom dev.	Online client portal	Q3	
8	Package implement	ERP implementation (SAP)	Q3	Q4
9	Custom dev.	Customer billing enhancement	Q3	Q4
10	Package customise	Implementation of Order Automation system	Q3	Q4
11	Infrastructure	Update and install IT infrastructure in new premises	Q1	
12	Package customise	Crew planning system replacement	Q3	Q4
13	Custom dev.	Custom development of crew rostering system	Q3	
14	Custom dev.	Crew information for US border entry	Q3	
15	Custom dev.	Website statistics	Q3	
16	Package customise	Custom freight system	Q3	

Project No	Classification	Description	Primary Type	Secondary Type
17	Package customise	Claims system replacement	Q3	Q1, Q4
18	System migration	Housing department data migration	Q3	Q4
19	Package customise	Selection and implementation of Video publication system	Q3	Q4
20	Process Offshoring	Enablement of business process offshoring	Q4	Q1
21	Custom dev.	Shopping centre website	Q3	Q4
22	System migration	Total systems and service migration	Q3	Q1, Q4
23	Custom dev.	Replacement of Futures Trading application	Q3	Q4
24	Package customise	Customisation and implementation of CRM system (Siebel)	Q3	Q4

Project Type is based upon the Goals and Methods matrix (Turner 1999) described in Chapter 4.

APPENDIX 3: PROJECT SIZE AND SCALE

Project No	Industry	Comp-osition	Duration (months)	Total staff	Size units	Size rating
1	Health	Simple	8	18	144	medium
2	Manuf.	Simple	6	8	48	small
3	Financial	C/V	27	100	2700	large
4	Transport	Simple	18	50	900	large
5	State Govt	Simple	12	8	96	small
6	Federal Govt	C/V	15	14	210	medium
7	Financial	Complex	24	100	2400	large
8	Manuf.	C/V	24	65	1560	large
9	Telco	Simple	12	9	108	small
10	Telco	C/V	13	40	520	large
11	Recruit	C/V	6	8	48	small
12	Transport	Complex	24	17	408	medium
13	Transport	Simple	18	30	540	medium
14	Transport	Complex	15	15	225	medium
15	Marketing	C/V	8	9	72	small
16	Transport	C/V	18	10	180	small
17	State Govt	Complex	18	100	1800	large
18	State Govt	Complex	12	42	504	large
19	Media	C/V	13	40	520	large
20	Financial	Complex	36	52	1872	large
21	Retail	C/V	12	24	288	medium
22	Financial	Complex	27	350	9450	large
23	Financial	C/V	36	32	1152	medium
24	Pharma	Complex	18	40	720	large

Key to Project Size and Scale Attributes:

Composition	Simple	This is the simplest project model, where the project is conceived, developed and implemented by an in-house team responsible only to the sponsoring organization.
	C/V	A Client-Vendor project in which there is a vendor supplying software or services to the sponsoring organization, and a project team comprised of members of both parties (the team may be combined or separate)
	Complex	This describes the more complicated case where two or more vendors or third parties are involved in the project provision, usually supplemented by representatives from the sponsoring organization. The teams may be combined or separate.
Size Units		A simple approximation of the project size and complexity (number of staff times the duration in months) – roughly equal to person-months.
Size Rating	Small	Projects with a number of size units in the range 48-200
	Medium	Projects with a number of size units in the range 201 - 600
	Large	Projects with a number of size units in the range 601 – upwards

APPENDIX 4: ASSESSMENT OF PROJECT OUTCOME

Project No	Industry	Importance Rating	Observations	Outcome
1	Health	very high	Two previous attempts had failed	Successful
2	Manufacturing	very high	Several previous attempts had failed	Successful
3	Financial	extreme	Delivered six months late	Challenged
4	Transport	very high	Organization taken over	Cancelled
5	State Govt	very high	Previous attempt had been abandoned	Successful
6	Federal Govt	extreme	Project over eight months late, "red-alerted" and vendor lost heavily	Severely challenged
7	Financial	very high	This was the fourth or fifth attempt. Delivered late.	Challenged
8	Manufacturing	extreme	Two previous attempts had been abandoned	Successful
9	Telco	extreme	Organization went into receivership	Cancelled
10	Telco	high	Vendor could not deliver	Cancelled
11	Recruitment	extreme	Meticulously planned	Successful
12	Transport	medium	Very good relationship established between sponsor and vendor	Successful
13	Transport	high	Complicated project, not a pleasant experience	Challenged
14	Transport	medium	Vendor was incompetent	Severely challenged
15	Marketing	high	Lack of governance and planning	Severely challenged
16	Transport	medium	Team spread across 3 continents	Successful
17	State Govt	very high	Complex project, installed with 170 change requests outstanding	Challenged

Project No	Industry	Importance Rating	Observations	Outcome
18	State Govt	extreme	Complex project with many changes to specifications	Challenged
19	Media	very high	Many unknowns, high stress	Successful
20	Financial	very high	Long running multi-stage project	Successful
21	Retail	very high	Very resistant cultural and political environment	Successful
22	Financial	extreme	Very complex project with two sponsoring organizations	Successful
23	Financial	medium	Delivery time was double the estimate, but objectives were finally achieved	Challenged
24	Pharmaceutical	very high	System delivered on time but acceptance level very poor	Severely challenged

Key to Assessment of Project Outcome:

Importance Rating	A subjective assessment, provided by the interviewee, of the relative importance of the project to the organization's operational future.
Outcome	A subjective assessment, provided by the interviewee, and corroborated by my analysis of the interview transcript, of the result of the project endeavour.
Successful	The project was delivered to the sponsor's satisfaction having achieved the business objectives of functionality and quality, and having met its time and budgetary targets.
Challenged	The project was delivered, but with some functional deficiencies, and/or it exceeded its time and cost objectives.
Severely Challenged	The project was delivered with serious functional deficiencies, and/or it severely exceeded its time and cost targets.
Cancelled	The project was abandoned and no part of it was ever implemented.

APPENDIX 5: INFLUENCES ON INDIVIDUAL LEARNING

Respondent No	Dominant Learning Style	Role	Intuitive / Sensing	Primary Project Type	Stated personal learning
1	Activist	Leader	Intuitive	Q1	Dealing with organizational change
2	Theorist	Specialist	Intuitive	Q3	Industry process knowledge
3	Theorist	Specialist	Sensing	Q3	Technical and analytical skills
4	Reflector	Specialist	Sensing	Q1	Technical and organizing skills
5	Pragmatist	Leader	Intuitive	Q4	Stakeholder relationships and manipulation
6	Pragmatist	Leader	Sensing	Q1	Project initiation
7	Theorist	Specialist	Sensing	Q3	Multi-tasking
8	Activist	Specialist	Intuitive	Q3	Co-worker engagement
9	Theorist	Specialist	Sensing	Q3	Self sufficiency in a hostile environment
10	Pragmatist	Leader	Sensing	Q4	Caution with accepting project opportunities
11	Pragmatist	Leader	Sensing	Q1	Care with team member selection
12	Theorist	Specialist	Sensing	Q3	Co-worker engagement
13	Theorist	Specialist	Sensing	Q3	Improved technical skills
14	Pragmatist	Leader	Sensing	Q3	Vendor engagement and management
15	Activist	Leader	Intuitive	Q3	Importance of requirements gathering
16	Pragmatist	Leader	Sensing	Q3	Managing a dispersed project team
17	Pragmatist	Leader	Sensing	Q3	Customer engagement skills

Respondent No	Dominant Learning Style	Role	Intuitive / Sensing	Primary Project Type	Stated personal learning
18	Activist	Leader	Intuitive	Q3	Managing competing stakeholder requirements
19	Activist	Leader	Intuitive	Q3	Relationship management, Vendor management
20	Activist	Specialist	Intuitive	Q4	Technical skills, life skills
21	Activist	Leader	Intuitive	Q3	Stakeholder engagement
22	Pragmatist	Leader	Sensing	Q3	Insistence on intra-project reviews
23	Theorist	Specialist	Sensing	Q3	Working with offshore teams, living with politics
24	Reflector	Specialist	Sensing	Q3	Project initiation and business engagement

APPENDIX 6: HERMENEUTIC INTERPRETATION OF INDIVIDUAL LEARNING

Respondent No	Role	Stated personal learning	My interpretation of the learning
1	Leader (contractor)	Dealing with organizational change, managing objections	This was a very positive and motivating experience for the subject. The subject's claimed personal learnings are most likely realistic, and in fact probably go deeper than he suggests. He appears also to have learned significant management and political skills, and the ability to manipulate his stakeholders to achieve his objectives. He has capitalised on the success of the project to move on to more senior appointments with other organizations.
2	Specialist (contractor)	Industry process knowledge, system design knowledge, management skills	This was a traditional consulting role. The subject appears to be a very experienced ERP consultant and this job gave him an opportunity to exercise his substantial knowledge and skill. I am unconvinced by his learning claims. I think this was more of a routine task than a learning opportunity. He was happy to undertake the role, and move on at the end. He was unconcerned about leaving the documentation undone.
3	Specialist (permanent)	Technical and analytical skills, end-user relationship building	The subject impressed as a very clear thinking and diligent person, and an effective organizer of herself and others. She had moved into this role having previously worked on another project at a different company that failed completely because of lack of organization and methods. Her motivation seemed to be to demonstrate her considerable skill within an effectively organized environment. Her learnings were probably more about reinforcement than gaining new knowledge. She spoke enthusiastically about the coaching she was able to provide in the creation of Use Cases. She seems to have been motivated to train others: perhaps that was her main learning.
4	Specialist (permanent)	Technical and organizing skills	The subject was enthusiastic about the learning opportunities presented by this role. In spite of the unfortunate outcome (it was cancelled), he spoke in complimentary terms about the project leadership and the way they encouraged learning. This seems to have been a powerful learning experience and he leveraged his new knowledge to gain a significant upwards promotion in his next assignment. There was strong evidence of both concurrent and retrospective learning.
5	Leader (contractor)	Stakeholder relationships and manipulation	This seems to have been a great personal learning experience. The subject recounted her experiences very clearly and she had an unambiguous understanding of what she had learned, providing evidence of reflection. She understood how she had effectively manipulated her stakeholders, and how she had persuaded them to follow her ideas and leadership. She appeared to have learned very effectively both concurrently and retrospectively. There was evidence that she became highly respected within the organization and ultimately she used her enhanced knowledge to move on to other more advanced and senior roles with other organizations.

Respondent No	Role	Stated personal learning	My interpretation of the learning
6	Leader (permanent)	Contract negotiation, Project initiation	This is not a project that the subject will remember with any pleasure. He was unable to gain the traction he needed with the client. His persuasive powers were not effective; the relationship with the client deteriorated. He failed to understand the reasons why his approach was not succeeding. His mental model seems to have depended on powerful persuasion or even coercion to obtain the level of cooperation the project needed. The client resisted his approach, but the subject did not adapt. The project staggered to an unsatisfactory conclusion six months late, with the subject blaming the client for all the problems. Without deeper research it is impossible to know whether a more flexible approach might have produced a better outcome. But ostensibly it seems that the subject failed to adapt to the situation and failed to learn how best to deal with his problematic client. And at the time of the interview, when the project had just concluded, there was no evidence of any reflection or retrospective learning having taken place.
7	Specialist (permanent)	Multi-tasking within a complex milieu	This project appears to have been a major test of endurance. The most memorable thing about the project was that it was "difficult". A major interpretation from this interview was a sense that the subject exhibited a very high level of professionalism and dedication. The main learning (unexpressed) was probably endurance under intense pressure for a long period of time. There was an impression that this was an uncomfortable experience, and I believe the subject learned perseverance and fortitude more than anything.
8	Specialist (contractor)	Co-worker engagement	The impressions of this contributor were that he was very extrovert and sociable, and that he enjoyed his work and he enjoyed this job. He was able to use his skills as a coach and a networker, and he welcomed the opportunity to hone his skills. I do not believe he is an ambitious person seeking personal advancement, he is happy to share his knowledge and coach and encourage those around him.

Respondent No	Role	Stated personal learning	My interpretation of the learning
9	Specialist (permanent)	Self sufficiency in a hostile environment	This subject tried unsuccessfully to bring order out of chaos. He brought into this project many years of professional experience, and rapidly developed a personal mental model that he was more capable and more professional than any of his team mates. He could not adapt his approach to persuade his leadership to adopt his ideas. Eventually this led to a showdown where he was the loser. He failed to learn along the way, but there was evidence of considerable reflection after his departure. This was evidenced by the length of the interview and his willingness to share his personal musings. This was a significant life experience and the learning was more about building a mental model such that he could shield behind the organization's incompetence, and claim that he had been poorly treated for trying to bring an unwanted level of professionalism. It is not clear that he would behave differently in a similar circumstance next time, but I believe that his mental model would steer him away from arriving in such a position.
10	Leader (permanent)	Caution with accepting project opportunities	This subject seemed to be paralysed by the (perceived) inexperience and incompetence around him. He repeatedly compared this project unfavourably to the practices at his previous employer. He was unable to adapt his mental model to suit the new circumstances. This project required the rapid acquisition of new skills in areas of negotiation and political manoeuvring. He failed to learn and adapt during the course of the project and I am not sure that he understands even now what went wrong. At the time of the interview it was apparent that he was still feeling wounded by the experience: he was still out of work. His claimed learnings are more around avoidance of a similar situation rather than understanding what went wrong and how he might have been able to influence the outcome.
11	Leader (contractor)	Care with team member selection	The subject's personal learnings were probably correctly stated. This project was an exercise in using his exceptional organizational and technical skills, but it may not have been a major test of these. The learning elements were mainly around the avoidance of errors in future. He used his contacts to great effect, but he made one poor choice. There was an error of judgement in the choice of a team member that still irritated him. His mental models included a great confidence in his own ability and a denial that he ever made mistakes. He thought that this project was very much within his comfort zone, but in his view he made one serious mistake. There was an element of arrogance here, he possibly underestimated the task and his personal opinion of himself was somewhat damaged as a result. I believe that he has learned from this project and will proceed with more caution in future.

Respondent No	Role	Stated personal learning	My interpretation of the learning
12	Specialist (permanent)	Co-worker engagement, utilising other people's skills effectively	This subject gave the impression of being a good solid performer. He was a long term servant of the sponsoring company, and was very convinced of his own worth and confident in his own experience. He tended to be very dismissive of the efforts of others with less experience. I am not convinced of his claimed learning, and there was a sense that he did not extend himself on this project. I believe that his real learning was probably more a reinforcement of his mental models.
13	Specialist (contractor)	Improved technical skills	This subject had difficulty articulating his learnings, and does not appear to have enjoyed his project role. It was difficult to draw him out on his project experience and there was a sense that he did not really understand the nature of the interview or the intent of the questions. There was a feeling that, as a migrant from the former communist bloc, he was uncomfortable being interviewed and was reluctant to reveal too much of himself. Uniquely among my research group, this subject was guarded in his responses, and was inclined to tell me what he thought I wanted to hear.
14	Leader (permanent)	Vendor engagement and management, resilience and patience	This subject was very experienced and professional. I think her main learning was around understanding the culture and operational methods of her new organization. She already had experience in project leadership and managing a portfolio of projects. She knew how to manage a vendor relationship, and she understood about negotiating terms of reference. I think that her new personal learning from this project situation might have been somewhat limited, and I believe that she saw one of her main contributions to the project to be coaching her staff into understanding the dynamics of vendor engagement.
15	Leader (permanent)	Importance of requirements gathering	I think the subject's stated learning is probably inaccurate. He found that the project was considerably more challenging than he expected, and that his knowledge of project management techniques was inadequate to deliver a good quality outcome. He was forced into a challenging situated learning experience with which he clearly was not comfortable. He appeared not to relish the learning opportunity and seemed to prefer to retreat from it back into the technical domain with which he was much more comfortable. His learning may have just been sufficient to create a mental model that he did not enjoy working in leadership.

Respondent No	Role	Stated personal learning	My interpretation of the learning
16	Leader (permanent)	Managing a dispersed project team, managing uncooperative team members	I think this contributor's claimed learning is an accurate assessment. He demonstrated a strong internal locus of control; he was very self-sufficient. He adapted to the dispersed project team very effectively, adapted his management style to deal with moody uncooperative people, and delivered the project on time. He also managed customer expectations very effectively, and took full advantage of a fortuitous time delay. It is significant that he reported to his management only three times during the course of the project: he was perceived as a safe pair of hands. The ultimate pragmatist.
17	Leader (permanent)	Customer engagement skills	This subject was a highly experienced PM, ex military, and obviously used to assuming control and being in charge. He managed this project as I am sure he managed many others, in a tough uncompromising way. I am not sure that he learned anything new. He claimed to have learned to deal with clients in a straight-talking way, but I suspect he would always deal with them in this way. I think he had a mental model that was constructed around his long experience and his ability to cope with anything that presented itself. I suspect that he had a rather inflexible approach and is probably not particularly receptive to new ideas. He is not a visionary person, but probably ultra-reliable. There is a clue that over 100 persons were used on the project – this sounds like high turnover – and could be an indication of his authoritarian approach. His long experience and expert delivery suggests a well developed absorptive capacity.
18	Leader (permanent)	Managing competing stakeholder requirements, flexible working	I think this was a great learning experience for the contributor. It required the exercise of a great deal of patience with a difficult client, who was initially quite resistant, but was steadily won over by consistent and regular delivery of good quality results. There were difficulties with the co-vendor where there was a tendency to blame each other for missed deadlines. This was resolved over time by a tacit agreement that they needed to collaborate. The subject recognised the importance of building relationships and learned in real time how to develop this skill. This project has necessitated learning how to position his team within a complex political environment and how to respond tactically to different situations. The subject has learned how to break the rules in order to satisfy both the client's needs and his own organization's reporting requirements. He has constantly been performing a balancing act, but it appears to be effective because the client survey responses have been positive. The high-stress environment has also encouraged learning within his project team, and there is evidence that they have acquired significant new knowledge.

Respondent No	Role	Stated personal learning	My interpretation of the learning
19	Leader (contractor)	Building relationships, vendor management, communication skills	The subject had mixed feelings after this project. It was an intensive learning experience as recounted by him, and I think he has accurately assessed all the many things that he learned. However the experience was so draining and so intrusive that he doubts he will ever take on anything so challenging again. In spite of the valuable learning that has occurred, the subject seems to be developing a mental model that is concerned with avoiding similar high stress situations. He has already declined other leadership roles that he felt might be too demanding. He is however content to use and share his new knowledge in more controlled and less frenetic situations. This subject appears to be intelligent and energetic, and later reflection may moderate this attitude to the point where he is able to take on demanding roles without allowing himself to become overstressed.
20	Specialist (contractor)	Technical skills, leadership, life skills	The subject was enthusiastic about this project. He saw himself as a valued contributor to an engaging and meaningful undertaking that was saving millions of dollars for the sponsoring organization. He was particularly encouraged by the regular trips to India and had developed considerable affinity with his contacts there. There seemed to be almost an altruistic motivation in that he saw his role to be benefiting people that were far less privileged than he. His claimed learnings are probably accurate; this was a high stress / high reward project with many learning opportunities around gaining technical knowledge, leadership of technical teams, and designing and organizing technical aspects of the project delivery. He seemed to relish the role and felt that he had gained considerably both in terms of expertise and self-management.
21	Leader (contractor)	Stakeholder engagement, vendor management	This subject is a very experienced project professional, and seems comfortable in a leadership role. This was a challenging situation that needed quick thinking and decisive action in order to maintain momentum. The sponsoring organization was uncooperative and resistant and a highly flexible approach was required. The subject seemed to learn and adapt rapidly and was unafraid to take rather radical steps to keep the project moving. She seemed to enjoy the opportunity to adopt unconventional measures, and seemed motivated by the unusual challenges that were presented. There was strong evidence of both concurrent learning and double-loop experimentation. There was also considerable retrospective learning as evidenced by the way she was able to analyse succinctly the way the organization functioned and where the power bases lay. She was also happy to coach others and encourage them into adopting her flexible approach.

Respondent No	Role	Stated personal learning	My interpretation of the learning
22	Leader (contractor)	Insistence on intra-project reviews	This contributor was recruited into this project as a professional hire because of his great experience with major projects, with a particular brief to coach one of the internal staff in his techniques. He is a strong character, used to the leadership role, and also seemed insightful and flexible. He appeared to work easily within the leadership team and was quite ready to share responsibility. He learned to adapt to the conflicting cultures across the two organizations, and seemed to be influential in getting them to work together. He spoke very highly of his colleagues and learned to work effectively with all of them. This was a high pressure situation but he made no mention of stress. I think he employed his existing knowledge and skill, and learned rapidly about blending cultures and optimising the contributions of his colleagues while working under major time constraints. He was also very concerned about capturing project learning for re-use. There was strong evidence of a highly developed absorptive capacity.
23	Specialist (permanent)	Working with offshore teams, living with politics	I suspect that this subject was a somewhat reluctant member of this project, and that he was never wholly supportive of it. I also think that he may have been a little restrained about presenting his real views in the interview. He was wary of using offshore resources to deliver the project and was unsurprised when it ran substantially over time and over budget. He saw this as a vindication of his original doubts. I think he held some fairly unshakeable mental models that precluded him from embracing this project enthusiastically. It is probably significant that he moved on before the project was complete. There were indications that other members of the team were more supportive of the objective than he was. The claimed learnings are probably more related to reinforcement than genuine new knowledge
24	Specialist (permanent)	Project planning and business engagement	The learnings that the subject gained from this project are probably overstated. There was a strong sense that this task was nothing but a chore. He was not impressed with the project leadership nor the haphazard way in which it was executed. The offshore component meant that he was working highly uncivilised hours, and he believed that he was subjected to quite unreasonable pressure in order to meet an unrealistic deadline. The claimed learnings are probably more reinforcement of mental models that he brought into the project, and relate to those aspects that he perceived as having been done poorly

APPENDIX 7: INTERPRETATION OF COLLECTIVE LEARNING

Project No	Industry	Project Team Learning	Sponsor Organization Learning	Vendor Organization Learning
1	Health	PM seemed to be a controlling person who provided limited opportunity for team contribution.	This was a repeat project, so the organization had learned sufficiently to appoint a capable PM for this iteration. However no further attempt was made to learn following the success of this project.	No vendor was involved
2	Manuf.	The team was led by the CEO who was disinclined to accommodate shared decision-making.	No attempt was made to retain any project learning	No vendor was involved
3	Financial	Attempts to provide coaching in new techniques to the older experienced team members was awkward and ineffective.	The very effective standards used by this project were adopted by the organization for future use.	
4	Transport	The project had a highly effective formal programme of training and cross-training.	The project was abandoned and no staff were retained. The organizational learning was zero.	No vendor was involved
5	State Govt	The team culture seemed open and sharing, with opportunities for improvisation.	There was considerable early enthusiasm to adopt the techniques used in this project, but this is believed to have been short lived.	No vendor was involved
6	Federal Govt	This was a difficult and highly politicised project. The team learning outcomes were unclear.	Believed to have been very low.	Improved contractual negotiation.
7	Financial	Knowledge sharing did not seem to be an intention of the project.	The team was released at the end and learning was minimal.	The vendor has a process in place to review projects and improve work practices.
8	Manuf.	A very effective knowledge repository was in place that assisted team learning	This was a repeat project, so the organization had learned sufficiently to appoint a very strong project team.	The vendor practice is always to review projects.
9	Telco	The team was not receptive to any attempts at knowledge sharing.	The organization was disinclined to adopt any improvements suggested.	No vendor was involved

Project No	Industry	Project Team Learning	Sponsor Organization Learning	Vendor Organization Learning
10	Telco	This project was abandoned and team learning outcomes were unclear	The potential learning was substantial but it is unclear if any was realised.	This was a harsh learning opportunity for the vendor but it is unclear if it was exploited.
11	Recruit	Knowledge sharing did not seem to be an intention of the project.	No attempt was made to retain any project learning	
12	Transport	Knowledge sharing did not seem to be an intention of the project.	The organization has learned to articulate their requirements much more clearly.	
13	Transport	There seemed to be limited opportunity for team contribution.	The potential learning was substantial but it is unclear if any was realised.	No vendor was involved
14	Transport	The team seems to have gained in confidence and maturity as the project progressed	The organization has learned to manage vendors better	The vendor has resisted improving any of their project practices
15	Marketing	The team culture seemed relatively open and sharing		Improved understanding of Agile project techniques
16	Transport	Widely dispersed team made effective learning difficult.		Little socialisation of knowledge takes place; the vendor depends heavily on staff retention.
17	State Govt	Knowledge sharing did not seem to be an intention of the project. There was very high turnover.	No obvious attempt was made to socialise any new knowledge	The vendor processes to manage new knowledge are "less than robust".
18	State Govt	The team seems to have gained substantially in confidence and maturity as the project progressed		The methods used by the team seem to have gained some recognition.
19	Media	Knowledge sharing was encouraged and the team seems to have gained in confidence.	The standards used by this project were adopted by the organization for future use.	
20	Financial	High levels of knowledge sharing, and participation in decision-making was actively encouraged	The methods employed by this team have been recognised as highly effective, but are not yet widely socialised.	

Project No	Industry	Project Team Learning	Sponsor Organization Learning	Vendor Organization Learning
21	Retail	Agile techniques were used effectively and the team seems to have bonded well.	The organization is resistant to adopting any new or formal project knowledge.	
22	Financial	The project had very strong centralised leadership and knowledge sharing was not a priority.	Effective use was made of progressive project reviews. Longer term benefits are unknown.	
23	Financial	Dispersed project team and high turnover adversely affected team learning.	This was a combined Business + IT project and there seems to be positive evidence of organizational learning.	
24	Pharma	Widely dispersed project team, and poor project practices led to issues with motivation, and learning outcomes were poor.	The potential learning was substantial but it is unclear if any was realised.	

Note: a blank entry indicates that there was insufficient collected data to make any valid interpretation or assessment of the organizational learning activity that may have occurred in that context. This was for the reason that the interviewee represented the other party, and they were not in a position to make any realistic appraisal of the other organization's learning.

APPENDIX 8: ORGANIZATIONS FOR WHICH THE AUTHOR HAS WORKED

I have worked for the following organizations during my career in Information Technology and contributed to project activity in one way or another:

Organization	Industry	Location
West Midlands Gas	Regional Gas Distribution	Solihull UK
Zimmer Aktiengesellschaft	Industrial Plant	Frankfurt Germany
British Industrial Plastics Ltd	Plastics manufacturing	Birmingham UK
ICL Australia	Computer hardware and software	Sydney Australia
Email Ltd	Electrical products	Sydney Australia
Warman International Ltd	Mining Equipment	Sydney Australia
Racal Electronics PLC	Electronics manufacturing	Bracknell UK
NCR Australia	Computer hardware and software	Sydney Australia
Yves Saint Laurent	Fragrances and fashion	Sydney Australia
Holt Lloyd Australasia	Chemicals and Paint	Sydney Australia
KMG Hungerfords	Accountancy services	Sydney Australia
Nielsen and Moller	Glass manufacturing	Sydney Australia
Banque Indosuez	Merchant Banking	Sydney Australia
Societe Generale	Merchant Banking	Sydney Australia
State Trustees Limited	Trustee services	Melbourne Australia
Progress Software	Software and services	Sydney Australia
Windscreens O'Brien	Glass manufacturing	Sydney Australia
One.Tel Limited	Telecommunications	Sydney Australia
GE Mortgage Insurance	Insurance services	Sydney Australia
Royal Institute for Deaf and Blind Children	Education	Sydney Australia
Motor Mate Products	Car care products	Windsor Australia
Royale & Company	Apparel	Sydney Australia
Getronics Australia	IT Service Providers	Sydney Australia
Energy Australia	Electricity retailing	Sydney Australia
Dept of Family & Community Services	Federal Government Dept	Canberra Australia
Dept of Industry Tourism and Resources	Federal Government Dept	Canberra Australia
Attorney General's Dept of NSW	State Government Dept	Sydney Australia
Commonwealth Bank of Australia	Banking services	Sydney Australia
St George Bank Limited	Retail banking	Sydney Australia
AstraZeneca Australia	Pharmaceuticals	Sydney Australia

APPENDIX 9: ORGANIZATIONS INVOLVED IN THE RESEARCH

The following organizations have been involved in the information technology projects included in this research:

Fujitsu Australia
Attorney General's Department of NSW
Macquarie Bank Limited
Westpac Banking Corporation
St. George Bank Limited
CSC Australia
AstraZeneca Pty Limited
Accenture
IBM Australia
IBM Daksh (Bangalore)
Wideline Pty Limited
SE Sydney Area Health Service
P & O Ports Australia
Object Consulting
SAP Australia
Qantas Airways
Soul Telecommunications
Cargowise EDI
Newscorp
Westfield Group
GE Finance
Syple Technologies
One.Tel Limited
Satyam Computer Services
Singapore Customs
Australian Defence Force
Amcor Limited
Jeppesen
Transport Accident Commission of Victoria
Housing & Community Building Commission of Vic
Subex Azure

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