Project management maturity: a critical analysis of existing and emergent contributing factors

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AUTHOR'S DECLARATION

I certify that the work in this thesis has not been previously 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 has been acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

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Abstract

This thesis explores the dynamics of a reliable project management capability responsible for undefined projects, and proposes new factors that could influence how project management maturity is determined and modeled. It demonstrates that unique processes and practices—that are not tightly controlled, repeatable and predictable—can contribute to the reliable management of e-Learning projects in a university environment.

A multimethod research design is used with two qualitative methods: textual (document) analysis of industry and organizational maturity models, and a case study of two university offices responsible for e-Learning projects. Model analysis reveals factors used for maturity assessment that are not dependent on process control (for example, culture, customer involvement and values). The output is a conceptual framework reflecting these factors, along with instructional design processes and other properties indicating reliability. Data are collected using this instrument and analyzed to test the validity of its components.

Results indicate multiple processes and practices that enable this project management capability in ways that do not fit the current view of project management maturity. Context-specific values and policies, specialized bodies of knowledge (instructional design), customer involvement, third-party influence, and tacit factors such as trust, morale and creativity. A clear path emerges of an alternative route to project management maturity.

This inquiry underscores the value in questioning a strict definition of 'maturity' that relies on the key principle of process control. It challenges the prescriptive orientation of the current generation of project management maturity models that codify (thereby legitimizing) certain processes and practices, leaving little room to appreciate unexpected phenomena that might also be contributing. Further research can build on the typological framework offered here to critically examine other project types with undefined, even contradictory or changeable requirements that require flexible project management capabilities without sacrificing their reliability. Exploration of these environments will create a more inclusive definition of project management maturity, and expand the conditions that lead to 'mature' project management capabilities.

This research contributes to this exploration by offering new and specific factors integral to the reliable project management capability associated with managing an e-Learning project, and challenges researchers and practitioners to identify others.

Acknowledgements

"It is how we choose what we do, and how we approach it, that will determine whether the sum of our days adds up to a formless blur, or to something resembling a work of art." (M.Csikszentmihályi 1997, p.13)

I read this quote recently and was struck by its emphasis on two things: a journey and its outcome. Now, I won't claim that this work is one of art, but I can attest to its approach—one that was shaped and supported by many others. They are listed below.

Professors Spike Boydell and Shankar Sankaran are at the top. As individuals, they are exceptional professionals and model academics. Together, their methods, management and research philosophies complement each other in ways that make them a formidable supervisory team. My gratitude to them is only surpassed by my confidence that others will similarly benefit.

Mr. Patrick Healy and Dr. Kaye Remington were pivotal figures along my journey as well. Frankly, I don't think they realize the significance of their contribution. I hope this note helps them do so.

As one can see on the title page, my journey started at the University of Technology, Sydney. Professor Lynn Crawford welcomed me, and for that I thank her.

My journey continued through several universities where staff and faculty assisted me in data collection. I can't mention them by name, but I trust that, after reading this, they'll see themselves in this work and know that I couldn't have done this without them. Thanks enormously to all.

A special thanks goes to Julia Finch and Alana Hughes for their assistance with the final document and its images.

On a personal note, very special thanks go to Patrick, Ian, Nora, Deb, Jeff, Julia, Gary W., David, Laetitia, Alejandra, Carmen, and Matthew who were companions in this journey. The late night chats, care packages, and never-ending willingness to listen are hugely appreciated. If patience was an Olympic sport…

Another special thanks must go to AM, CC, SB, GS, MC, BS, LVB, SR, YT, DB, EC, HCJ, TC, Q and others in a group who didn't say much, but were, nevertheless, always listened to.

And with that, I come to the end of this journey. I look forward to many others that (if I'm lucky) will involve some or all of those above.

Dedication

This work is dedicated to two remarkable people.

PJD (SPOY3X) and REW

There are few certainties in this world, and I know that one is that

I could not have gotten to this point without you both.

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List of Abbreviations

Table 1-1: List of abbreviations and their expansions

ADDIE	Assess, Design, Develop, Implement and Evaluate
CMM	Capability Maturity Model
E	Enabler
EWS	Early Warning System
GIS	Geographic Information System
HEI	Higher Education Institution
ICT	Information & Communications Technology
ID	Instructional Designer
MOU	Memorandum of Understanding
MPCS	Multi-dimensional Project Control System
NPD	New Product Development
PMI	Project Management Institute
PMBOK	Project Management Body of Knowledge
O	Observation
OGC	Office of Government Commerce
OPM3	Organizational Project Management Maturity Model
P	Process
PMO	Project Management Office
Pr	Practice
Pt	Property
P3M3	Portfolio, Programme, and Project Management Maturity Model
$(PM)^2$	Project Management Process Maturity Model
Prince2	PRojects IN Controlled Environments (version 2)
PROMMM	Project Management Maturity Model
QMMG	Quality Management Maturity Grid
SEI	Software Engineering Institute
SME	Subject-Matter Expert
SPC	Statistical Process Control
TQM	Total Quality Management
WBS	Work Breakdown Structure

Chapter 1
Introduction

1.1 Background to the research

Universities represent an organizational model on their own unique path toward project management maturity. Over the last decade, they have—as part of a larger trend where specialized management techniques are being adopted (such as strategic planning and business process re-engineering)—embraced project management practices in an attempt to apply a greater degree of planning and coordination to teaching and learning strategies. The management of e-Learning projects has been directly affected by such developments.

The adoption of formal project management has varied by institution, however, resulting in a unique blending of generic and specialized project management practices. It has also meant that project management maturity has varied across the community, with some considering themselves to have achieved a high degree.

Organizations will, over time and by accumulating more project experience, develop and likely improve their project management capability. Measuring and defining such improvement is considered a function of project management maturity – the greater degree of capability improvement, the higher level of maturity it has achieved.

A universal definition—much less an understanding—of project management maturity and its achievement does not exist. The issue raises many questions, and a review reveals inconsistencies. One is the disconnect between the use of prescriptive models relying on highly defined processes to measure capabilities that manage projects with undefined elements. This research explores this issue.

1.2 Statement of the research problem

The management of undefined projects postulates a sequence of events where the definition, repeatability and predictability of processes cannot be reasonably expected. This will, naturally, affect the reliability of the associated project management capability and perceptions of its maturity. The challenge to project

management maturity theorists is to recognize the possibility of project management maturity in an environment characterized by undefined project elements (goals and/or methods) and the requirement for greater flexibility in their management. Put another way, a key focus for this research is to integrate how the need to accommodate an undefined project affects the assessment of a project management capability and the perception of its maturity.

Tuner and Cochrane offer a project typology based on the definition of their goals and methods. This research focuses on a Type-3 project[1]: one where the methods are defined and the goals are not.

In exploring this challenge, this inquiry will investigate the following research questions:

1) How can a Type-3 organization[2] reliably manage a project with limited definability?
2) Can organizational-specific factors contribute to its project management capability and its increasing maturity?
3) What non-process factors contribute to reliable project management capability?
4) Can interpretations of 'maturity' be context-specific (within a given organization, industry or knowledge domain)? What specific factors can contribute to these interpretations?

1.3 Justification for the research

This thesis focuses on project management maturity as achieved by universities who have used the management of e-Learning projects to develop their project management capability. These projects—and their project management environments—present an opportunity to examine project management processes where the perceptions, expectations and techniques for managing the e-Learning projects were initially uncertain or undefined. A decade later, many examples can be found of institutions where both adoption of generic project management processes has widely occurred, and adaptation of these processes to address context-specific skills and knowledge has also happened. The use of project management practices across the university community is demonstrably higher now than when e-Learning emerged.

[1] Full definitions of the Turner & Cochrane project typology are provided in Table 2-7.
[2] Defined, for the purpose of this research, as an organization responsible for 'Type-3' projects.

The experience associated with universities managing their e-Learning projects presents an opportunity to examine the development—or maturation—of a project management capability in a unique organizational setting. These are industry-specific projects with multiple stakeholders from across the university, and specifically implemented to deliver on organizational teaching and learning strategy pertaining to e-Learning. This research is a compelling opportunity to examine how a specific project type (e-Learning) can contribute to project management maturity theory by increasing understanding of university e-Learning project management practices.

1.4 Overview of research methodology

The research questions focus on the project management capability responsible for managing an undefined project – one that is considered Type-3 according to the Turner and Cochrane (1993) typology. These questions are of an exploratory nature, rest on an interpretivist orientation and will use qualitative research methods to collect and analyze the data needed to answer them.

A multimethod research design comprised of two main stages supports this inquiry. The first is a compilation and analysis of two maturity model collections: one from the project management community and another representing the work of industries, organizations and various knowledge domains. Grounded theory techniques will be used in this analysis. On the basis of these findings and related literature (from e-Learning researchers and practitioners), a pilot case study will be conducted to explore the scope of a university unit responsible for the management of e-Learning projects, along with observations concerning the role of customers. The result will be a preliminary conceptual framework to be used in the exploratory case study involving two university teaching and learning units.

Two sites comprise the case study. Data will be collected at each primarily through interviews with project team members, documents, and archived material. Analysis of these data will occur using grounded theory techniques and revolve around the four major nodes of the conceptual framework (and its sub-components). Sites are limited to two in order to compare common ground but leave open the possibility for unique elements to emerge against the conceptual framework.

1.5 Outline of the thesis

This thesis uses a variation on the traditional 5-chapter structure (Perry 1998, p. 90): introduction, model and hypotheses, methodology design, data analysis and contribution to knowledge. An additional chapter (#4) is used here to document the analysis of maturity models and related literature. A more detailed outline is provided below.

1.5.1 Outline of chapters

1.5.1.1 Introduction and overview (Chapter 1)

This chapter provides a brief overview of the thesis: a statement of the research problem, justification, a review of relevant literature, description of the methodology, definitions, delimitations, and conclusions.

1.5.1.2 Review of the literature (Chapter 2)

To narrow the focus for this inquiry, the literature review begins with the historical justification and positioning of process control within the early Total Quality Management movement of the 1950s (with a special note of the Joseph Juran perspective). Various themes within the project management literature are identified to show how different practitioners perceived process control and have developed management principles and/or specific instruments.

The next section reviews definitions of 'project management maturity' and explores how the assessment of this concept has been codified in project management maturity models. Designs of these models are analyzed according to their structure, content and ascension design. Counter arguments are also provided.

The chapter ends with a review of project management maturity models through a typological framework. It demonstrates that a disconnect exists: the project management capabilities responsible for undefined projects are being assessed without consideration of flexible, spontaneous and immeasurable processes and practices that do not correspond with the definability, repeatability and predictability principles of current maturity models. On this basis, such project management capabilities could be considered 'immature' despite the use of processes and practices that suit their approach in managing undefined projects.

1.5.1.3 Research design (Chapter 3)

This chapter provides a thorough description of the multimethod research design used in this study. It positions it with a qualitative framework, justifies its use in a project management study and provides detailed descriptions of Project #1 (the Document Analysis) and Project #2 (the Case Study).

1.5.1.4 Document analysis (Chapter 4)

An analysis of two sets of maturity models (from within project management and across varied organizations, industries and knowledge domains), serves as Project #1 in the multimethod research design. This chapter assesses the properties from this analysis, a pilot study, and key concepts from instructional design, contributes to the conceptual framework used for data collection. Four major nodes are contained within the framework: defined processes, adaptable variants, customer involvement and dynamic non-events.

1.5.1.5 Case study: Data collection and analysis (Chapter 5)

This chapter analyzes data collected at two university sites where e-Learning projects are managed. It is comprised of four sections: the description of the analytical approach used, the presentation of Alpha and Beta sites, and then a comparison between the two.

1.5.1.6 Discussion and conclusions (Chapter 6)

This chapter answers the research questions by revisiting the nodes of the conceptual framework. Particular focus is directed toward the educational values, organizational policies, union influence, specialized bodies of knowledge and expert staff within these institutions. The involvement of customers is also explored, along with the defined processes that are integral to the management of e-Learning projects. The fourth node—dynamic non-events—is examined as an enabler of the entire capability.

The chapter concludes by exploring the implications of this research in theory, practice and methodology. A summary of contributions is presented, research limitations identified, and areas for future research discussed.

1.6 Definitions

The following terms and concepts are used throughout this inquiry especially in Chapters 3 (Research Design) and 5 (Data Collection & Analysis). Definitions are also included in Tables 5-2 and 5-3, but to heighten understanding and ease of reference they are summarized below.

Table 1-1: Table of definitions (Pasian, for this research)

Term	Definition
Course developer	A practitioner / expert in the development of multimedia application design.
Customer	Customers for the teaching products' of a university can be seen as including students, the general community, government, business and professional bodies. … The term 'customer' is used to mean someone who receives benefit from the product (Morrison & Rowan 2006b).
Departmental staff	A managerial or administrative member of a department or faculty; not a subject-matter expert.
Enabler	A characteristic pertaining to individual e-Learning processes and practices (not necessarily related to project management but within this environment).
Instructional designer	An expert in the science of instruction.
Observation	A remark or comment based on what has been noticed or said by either the respondent or researcher.
Practice	A usual procedure or practices, typically a matter of habit or tacit agreement.
Process	A defined way to perform an activity, generally involving a sequence of methods or procedures designed to accomplish a specific result.
Property	An essential or distinctive attribute of a quality or thing.
Sponsor	The senior academic or administrative officer responsible for approval of a project, including academic release and financials.
Subject-matter expert	An academic with recognized expertise in one or more areas. Responsible for content development in an e-Learning project.
Unit / Department manager	A manager specifically responsible for information technology services and application development (either within a specific unit or centralized department).
Wire frame	A wire frame is a scaled-down prototype that is built to test a design concept that will suit the intended audience. In the context of multimedia project, it might be a static mock-up or a set of story-boards to scope out and better visualize how things will need to be designed.
Type-3 project	As defined by Turner and Cochrane (1993, p. 93): a project where the methods are defined but the goals are not.

1.7 Delimitations of scope and key assumptions (and justifications)

Two key delimitations affect this research:

- Of the four project types within Turner and Cochrane's (1993) project typology, only Type-3 will be examined for this research. (where goals are undefined). This selection is consistent with e-Learning projects and will be discussed further in Section 3.5.4.1.
- The selection of sites has been limited according to the questions and characterizations identified in Table 1-2 and Table 1-3.

Table 1-2: Delimitation table for case study selection (Pasian, for this research)

Delimiting question	Indicator	Detail and/or example
What types of organizations manage Type-3 projects?	Multiple	Colleges & universities
What sectors apply?	Public sector	Higher education
What project type is managed here?	Type-3	e-Learning
Evidence of project management capability or techniques?	Yes	Published theory in multiple journals[3]

Table 1-3: Site selection table (Pasian, for this research)

Descriptor	Alpha site	Beta site
Population served	>500k	>500k
Location	Metropolitan area	Metropolitan area
Programs offered	Undergraduate, Graduate, Continuing Studies	Undergraduate, Graduate, Professional, Continuing Studies
Technological orientation	Moderate	Extremely strong
History with distance education (DE)	Moderate	Extensive
DE offerings	Moderate	Extensive
History with e-Learning	>10 years	>10 years
e-Learning offerings	Extensive	Extensive
Designated project management support for e-Learning projects?	Yes	Yes

[3] Relevant journals include (but are not limited to): *Journal of Distance Education*, *Australian Journal of Educational Technology*, *Educational Technology*, *The Internet and Higher Education*, and *Studies in Higher Education.*

1.8 Conclusion

This introductory chapter has laid the foundation for the thesis. It has provided the background concerning the increasing use of project management in a university community increasingly reliant on e-Learning projects to fulfill its teaching and learning strategies. The research justification and definitions are provided, along with a brief description of the methodology. The structure of the thesis is outlined, chapter by chapter, and delimitations were explained. On this basis, the thesis can proceed with a detailed description of the research.

Chapter 2
A review of the literature

2.1 Introduction

The primary focus of this research is to examine the limitations of project management maturity and associated models, in which process control is a fundamental component. This examination begins with a review of five areas of relevant literature: 'process' and 'process control,' process control research in project management literature, project management maturity, and project management maturity models.

Beginning with a discussion of 'process control' and its historical context, this concept will be situated in the project management literature to illustrate several specific interpretations. The review will continue by examining how process control has served as the backbone to project management maturity and the current generation of project management maturity models. The chapter will end with a reconciliation of project management maturity against a typological framework to reveal inherent inconsistencies (see Figure 2-1).

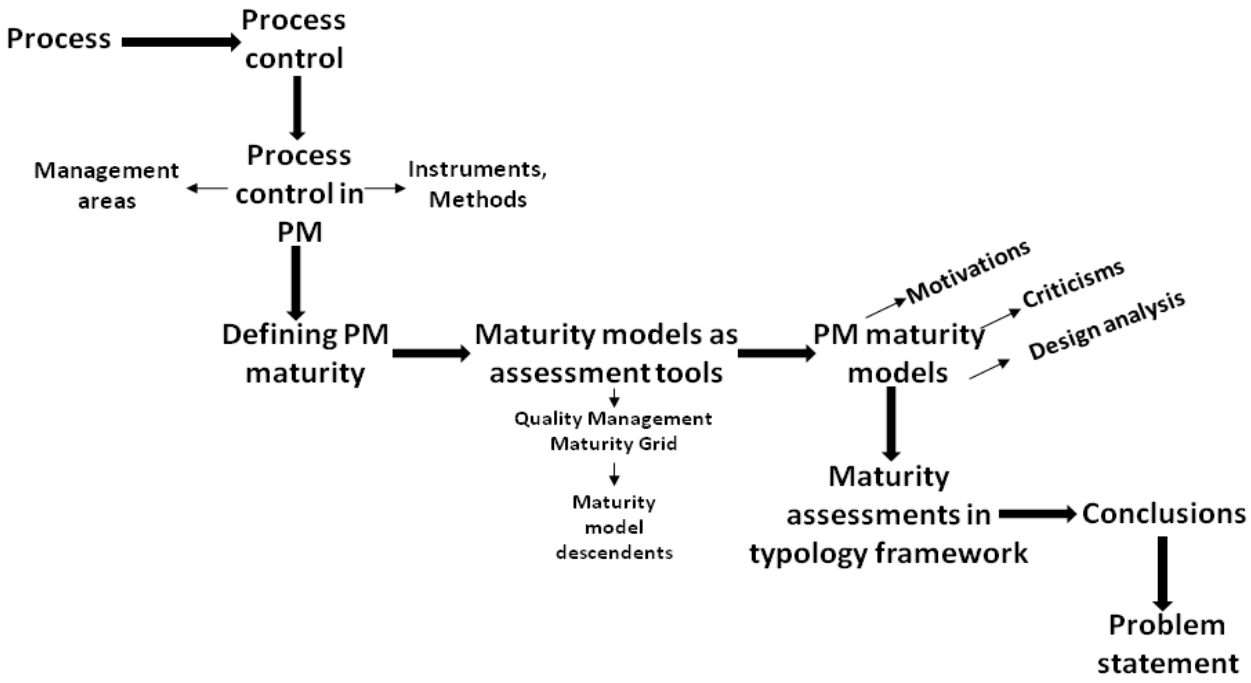

Figure 2-1 Pictorial outline of literature review chapter (Pasian, for this research)

2.2 'Process' defined and 'process control' explored

The purpose of this next section is to define 'process' in a context relevant to project management maturity, explain its importance to process control, and outline its relationship to project management.

2.2.1 What is a process?

The *Academic Press Dictionary of Science and Technology* (Morris 1992, p. 58) defines a process as:

> A systematic procedure designed to perform some action, engineering a continuous or periodic series of actions organized and conducted to achieve an end result such.

Within the quality management literature, the definition of 'process' emphasizes different elements of this detailed interpretation. Camp (1995b, p. 54) defines process as 'a series of work steps,' and Kinlaw (1992, p. 129) describes it as 'a sequence of steps by which work or a task is accomplished.' While consistent, one definition emphasizes steps while the other focuses on outputs. Both are situated within a product-generating or manufacturing context. Reflecting the demands of such an environment, Kinlaw (1992, p. 129) further argues for the existence of processes 'in every enterprise or business…[where] all products are manufactured by means of processes…[and] all services are delivered by means of processes.'

Two institutional—and very consistent—definitions of 'process' should also be mentioned here. The Project Management Institute defines process as '…a set of interrelated actions and activities performed to achieve a specified set of products, results or services' (2004, p.367). The Software Engineering Institute (of Carnegie Mellon University), offers something similar: a process is 'a set of interrelated activities, which transforms inputs into outputs, to achieve a given purpose' (SEI, 2010, p. 404).

Joseph Juran (1988, p. 169), a pioneer in the field of quality management, defines process as 'a systematic series of actions directed toward the achievement of a goal.' He describes the role of humans in the management of processes as important, explaining that processes occur within all functions to include the human forces as well as physical facilities. Other definitions of process including Kinlaw (1992) and Camp (1995) are less clear on the point of human involvement. It is the Juranian definition of process—one that must include human actors—that is most relevant to this research.

2.2.1.1 Classifying processes around specific domains/areas

Individual processes can be consolidated, categorized or classified into groups or domains. Barkley (2009, p. 5) argues that the practice of categorizing processes gives people a focal point, thereby encouraging businesses to identify new processes and products to serve their customers.

Such classifications systems can be highly subjective and take many forms (depending on the industry, organization or subject domain). Hammer (2007, p. 113) notes nine process areas—among them, leadership, culture, expertise, governance, design, performers, owners, infrastructure, and metrics—to focus on the identification and evaluation of processes with a generic business context.

The *Baldrige Quality Award* (2010) similarly offers seven criteria for nominees to categorize their processes within submissions. They include leadership, strategic planning, customer and market, measurement / analysis / knowledge management, human resources, and process management.

Outside the mainstream business world, process domains can have little or no references to human involvement. In these cases, the domains focus entirely on the specialized knowledge area. For example, in the area of law, (Gottschalk 2008a, p. 108) identifies four domains relevant to an analysis of increasingly sophisticated criminally-oriented organizations: activity, knowledge, strategy, and value.

Process domains can be markedly different from a general business context compared to a project management environment. Camp (1995a, p. 438), for example, offers a process classification scheme that distinguishes ‘management and support processes’ from ‘operating processes.’ Figure 2-2 illustrates these differences without depicting the relationship between the two macro process domains.

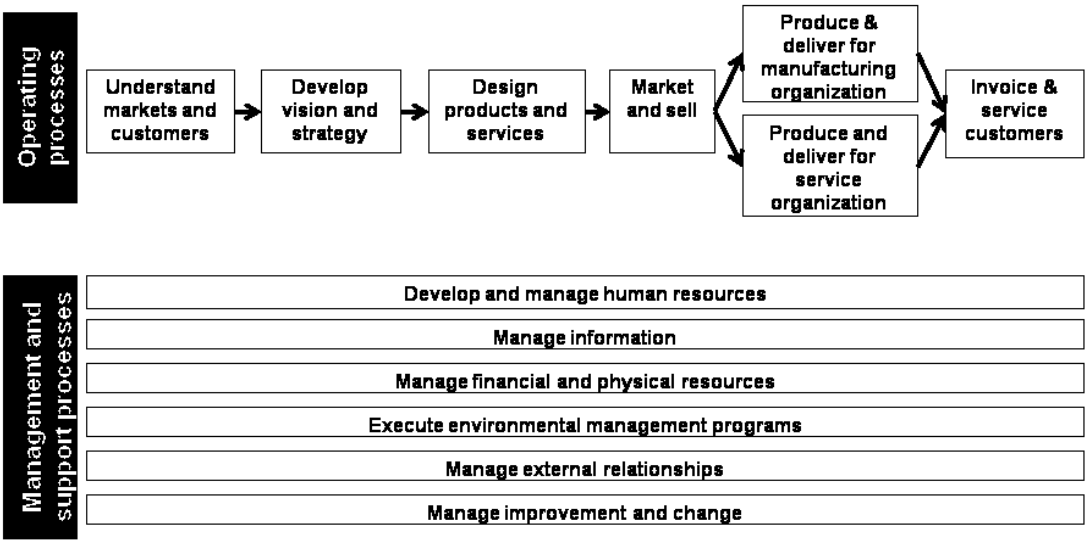

Figure 2-2: Process classification scheme (Adapted from Camp, 1995)

Within a project management context, Turner (1999, p. 8) describes a classification of project management processes comprising five basic functions and the relationship between them (Figure 2-3). Through the language and design of this process classification scheme, he is able to distinguish between the domains associated with the project organization, the scope of work and the time, cost and quality associated with doing the work.

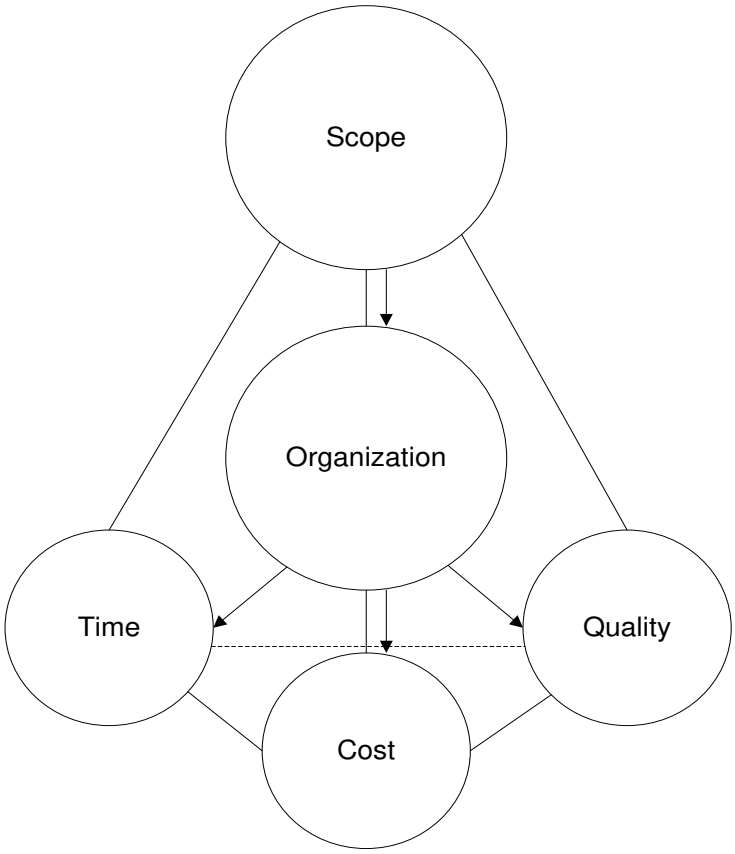

Figure 2-3: Turner's 5 functions of PM-based management (Adapted from Turner 1999, p.8)

Both the Turner (1999) and Camp (1995) examples illustrate the point that process areas are often conceptually broken down to accommodate the large number of variables required to characterize them (Van der Merwe 2002). The design and schema determined for each domain classification can provide stakeholders clear points around which they can focus their attention. Moreover, these classifications offer marks for measuring or evaluating those process areas. Maturity models, as will be discussed below, are the specific tools designed for project management process evaluation. They are wholly dependent on the clear identification of the constituent process areas.

2.2.2 Historical context of process control

Process management practices are grounded in three traditions: general management, information technology, and quality control. The focus of this review will be on the latter.

Quality management literature often positions process control in the context of the Total Quality Management (TQM) movement of the 1950s. It was the earlier works of Frederick Winslow Taylor (1913) and Walter Shewhart (1931), however, that laid the theoretical foundation for current views and methods concerning process management.

2.2.2.1 Taylorism

Taylor (1913) advocated the idea that control systems should be used to measure and reward workers' outputs. He argued that 'the greatest prosperity can only exist when the individual workers have reached their highest state of efficiency,' a state which can be measured by their daily output (1913, p. 11).

Ensuring the achievement of these 'first-class men' was the object of a good system (Taylor 1913). The backbone of such a system was to found in systematic management characterized by: science (not rule of thumb); harmony (not discord); cooperation (not individualism); maximum output, in place of restricted output; and the development of each man to his greatest efficiency and prosperity (Taylor 1913).

Set against the dawning of mass automotive manufacturing, Taylor's work shone a significant light on the importance of process management and control, and the roles played by both management and workers as human actors affecting and contributing to the systems.

2.2.2.2 Shewhart Control Chart

Walter Shewhart's work also influenced the use of process control techniques and is tangential to Taylor's work. To follow the logic of Taylorism, processes need to (or should) be managed, which indicates that that they might not be (under certain circumstances). To avoid or minimize mismanagement, greater control over processes is needed to identify, measure and evaluate those elements that are not under management and adversely affecting those processes.

Shewhart (1931) focused on these process variations, unknown, or chance causes that influenced quality standards set by product manufacturers. The problem, as he saw it, was the extent or degree to which the quality of a product may vary within the tolerances of control, and that the improvement of quality could be achieved through prevention rather than inspection. Shewhart's work was instrumental in shifting perspectives from outputs to the systems associated with production, their control and the variations that affected them.

Shewhart's challenge became the formulation of a scientific basis for prediction and process control (Shewhart & Deming 1939). His response (collaborating with W. Edwards Deming) to this challenge was the Shewhart Control Chart where he illustrated a quantification of process variations. The overall process could be seen as 'within control' (when the variations were within upper and lower control limits) and statistically out of control (therefore unstable) when the data were beyond those limits. Figure 2-4 illustrates this principle.

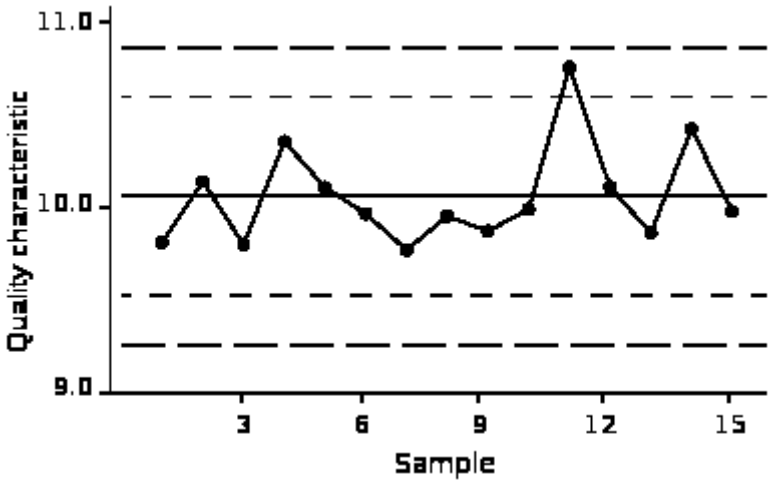

Figure 2-4: Shewhart Control Chart (Adapted from Shewhart & Deming, 1939)

A stable process is said to be in 'statistical process control' (SPC) when it is free from variations either in the product itself (caused by material) or from a variation in one or more process parameters affecting the production (Bhote & Bhote 2000). In Figure 2-4, all but sample '11' are 'stable' because they are within accepted variance parameters around '10.' While some variation is inevitable, reasons for variation outside certain levels of stability can be discovered and corrected using SPC analysis (Grant & Leavenworth 1972).

As the example of Shewhart's Control Chart demonstrates, data from a production system are plotted and analyzed. Points from the upper and lower control limits can be charted with anomalies (variations) identified. This quantitative approach to monitoring processes has contributed to the widespread use of statistics and statistical techniques—including sampling and frequency distribution—to manage and control quality (Dale, van der Wiele & van Iwaarden 2007, p. 442; Gedye 1968, p. 29). It is the use of

quantitative methods such as these that form the basis of Six Sigma, another methodology associated with process control.

Six Sigma 'is a project-driven management approach to improve the organization's products, services and processes by continually reducing defects in the organization' (Kwak & Anbari 2006, p. 708). It manifests as a statistical indication of variation expressed in terms of the standard deviation of the characteristic under consideration: the higher the sigma value, the lower the number of defects associated with the process (Dale, van der Wiele & van Iwaarden 2007, p. 440). Put another way, 'Six Sigma is a measure of quality that drives an organization to achieve near perfection through a management-by-fact and data-driven process that defines a defect as anything outside customer specifications' (Barkley 2009, p. 247).

A fundamental difference exists, however, between Six Sigma and other process improvement programs. It has the ability to prove an organizational context that facilitate problem solving and exploration across the organization (Mellat Parast 2010). 'It includes measured and reported financial results, uses additional, more advanced data analysis tools, focuses on customer concerns, and uses project management tools and methodology' (Kwak & Anbari 2006, p. 709).

2.2.2.3 Capabilities have a defined identity within SPC

The notion of 'capabilities having a defined identity' was described by Deming (1986) as one of the advantages he associated with processes under statistical control:

- The process has an identity: its performance is predictable, measurable, and open to communication.
- Costs can be predictable.
- Regularity of output is achievable.
- Productivity can be maximized.
- Relationships can be greatly simplified (especially with vendors).
- The effects of changes within the system can be measured with greater speed and reliability.

Relying on the argument that a process under statistical control has a 'definable capability,' one must also accept associated advantages. A statistically controlled capability is predictable, definable, productive, efficient, and effective. Another implication of these principles (although not specifically posited by Deming) is that a controlled process is being (or can be) managed and measured. Characterized by these

principles, individual processes or groups of processes that contribute to a capability can be considered mature if they meet certain thresholds.

As described above, processes generally either function or are considered as individual elements within an organization. Process areas, in contrast, support capabilities that mutually reinforce and contribute to macro organizational functions and/or activities. Assessing how and which process areas achieve which capability levels is an exercise in determining maturity levels. From a project management perspective, assessing which process areas achieve which capability level determines an organization's project management maturity. A more detailed review of this concept follows.

2.2.3 Juran's perspective and influence

Total Quality Management (TQM) is described as a management concept that represents a style of management aimed at achieving long-term success by linking quality with customer satisfaction (Kan 1995): one that can be established through the creation of a culture in which all members of the organization participate in the improvement of processes, products and services. Specific efforts to operationalize this link have manifested in the process maturity movement, of which maturity models are the designated instrument to measure maturity and indicate progress toward quality.

Process is, however, only one tenet of the TQM philosophy (Ross 1993). Several exist:

- Customer focus: TQM indicates the level of total customer satisfaction;
- Process: TQM advocates reduced process variations and continuous process improvement;
- Cultural: TQM advocates an enterprise-wide corporate culture awareness of quality priorities and pursuits; and,
- Analytical: TQM advocates continuous improvements in all quality parameters via measurement systems.

Of these four dominant principles, the emphasis on continuous process improvement has headlined discussions within maturity model literature as well as the design of individual models. Most project management maturity models are derivatives of the Software Engineering Institute's Capability Maturity

Model[4] (Paulk et al. 1993), for example, but seem unaware that the SEI/CMM is a model pre-occupied with continuous process improvement and is not inclusive of the customer-oriented focus advocated by Juran (Doss & Kamery 2005).

The TQM thought leaders (Deming, Juran and, later, Phillip Crosby) each supported customer satisfaction. It was Joseph Juran, however, who was especially strong in his advocacy of customer satisfaction as an essential element of quality planning and management. Defining customers as 'anyone who is impacted by the product or process,' he distinguished between those who were internal and external (Juran & Gryna 1988, p. 8):

- Internal customers include not only other divisions of a company that are provided with components for an assembly but others that are affected (e.g. a purchasing department that receives a specification for procurement).
- External customers include not only ultimate users but also intermediate processors, as well as merchants. Other customers are not purchasers but have some connections to the product (e.g. government regulatory bodies).

It is in this Juranian tradition that an increased presence of customer-oriented processes in project management maturity models is being researched—and represented in the conceptual framework (see Figure 4-2). The placing of process maturity on a TQM foundation is consistent with original TQM principles, but so is the inclusion of customer satisfaction as an end-goal of quality planning and management. Processes designed to reflect, engage and, ultimately, serve customer interests have been included in the maturity models industries and organizations but less so (almost to no extent) in project management maturity models—an issue identified in Section 4.3.1.

2.3 Process control research within project management literature

Process control has been researched from myriad perspectives in the project management literature. A review is presented in two sections below. The first (Section 2.3.1) highlights research into process

[4] All references to the Capability Maturity Model developed by the Carnegie Mellon, Software Engineering Institute will be referenced as SEI/CMM with the following bibliographic reference (Paulk et al. 1996)

control from the perspective of various management areas: time management, data management, decision making, stakeholder management, benefits management, conceptual cost estimating and early warning systems.

The second (Section 2.3.2) considers instruments and principles identified in the literature as relevant to process control. They include: standardized modules, Statistical Project Control Tool, Analytical Design Planning technique, Constant Work-in-Progress, 3-D animation, and a Multi-dimensional Project Control System.

The purpose of this review is to illustrate (through these representative issues) how process control principles have surfaced in project management practices.

2.3.1 'Process control' within specific management areas

The purpose of this sub-section is to identify a selection of themes that have emerged based on research into process control within the project management literature. Observations made by these researchers reveal that the process control principles of definability, repeatability, and predictability are clearly of interest to project management practitioners and researchers. The second sub-section echoes this observation.

2.3.1.1 Time management

Time management (and the related task of schedule control) is one area addressed from a process control perspective. The importance of ensuring work proceeds efficiently within individual tasks, along with the interfacing of related tasks, is a key message (Hameri & Heikkila 2002, p. 143). The ultimate measure being project success, based on effective control of time management processes, tools and practices.

An example of a time management model is 'the Fuzzy Front End' (Nobelius & Trygg 2002). Previous research has been done with the aim of developing one optimal process for opening project stages. The 'Fuzzy Front End' model advocates the customization of front-end activities to be performed before the actual start of the project. The aim of this approach is twofold: to gain competitiveness, and allow a more focused discussion on activity sequencing, prioritization and staffing.

Buffer Management is another scheduling method that complements process control (Goldratt 1986). Cohen et al. (2004) investigate this methodology in a multiple-project environment (the aircraft industry).

By correlating the interaction between activity precedence and resource constraints, they demonstrate that the use of 'buffer management' processes are useful to avoid project overruns.

2.3.1.2 Data and information management

The controlled management of information, data, and documentation and its relationship to project performance is a shared focus of research undertaken by Amami (2000), Back (2001) and Chang and Leu (2006). A common theme across these investigations is the exchange, access and/or manipulation of information (of whatever type). The timing of information delivery and the nature of the instrument used has tremendous impact on the efficiency of project time and resources.

Amami (2000, p. 5) found that software tools could best support and control document management procedures. Ultimately, the improved communications caused new product development re-engineering and leveraged organizational memory. The link was identified between document management (in his work, focusing on new product development), project planning and control, production structure, procedures and physical data storage.

Both Back (2001) and Chang and Leu (2006) focused on the impact of an effective information management implementation. Back concluded that information management contributed to goals that reduced project costs and scheduling (2001, p. 10). The focus for Chang and Leu (2006) was on data mining, arguing that process efficiency within the project can be aided by a more systematic approach to the identification, storage, categorization, and retrieval of data.

2.3.1.3 Decision-making

The impact of decision-making on process control has been explored by Powell and Buede (2006) and Al-Subhi Al-Harbi (2001). In a new product development environment, Powell and Buede (2006, p. 23) identify that the improper definition of decisions at the front end of the project can have a significantly negative impact on the total cost of the system's success with the users.. They suggest that key decisions should be categorized to capture an integrated view of processes, products and organizational requirements. These steps will aid project managers and system engineers during product development.

Al-Subhi Al-Harbi (2001, p. 19) describes the Analytical Hierarchy Process (AHP) as a decision-making method that quantifies priorities for a given set of alternatives: it organizes tangible and intangible factors

in a systematic way. In a project management setting, AHP allows for the consideration of multiple criteria (e.g. construction pre-qualification) in multiple settings.

2.3.1.4 Stakeholder management

Stakeholder management is another area within project management practice where researchers have explored process control implications. Legris and Collerette (2006) emphasize stakeholder management as a contribution that can improve the implementation process. Sutterfield et al. (2006) echo this view when they argue that effective stakeholder management (possibly through a Strategic Management Framework) can minimize changes in project planning and increase quality specifications (as opposed to quantity specifications). It is implied in both research efforts that strategic management can impact cost control during project implementation.

2.3.1.5 Benefits management

Bennington and Baccarini (2004) investigate the use of benefits management in Australian information technology projects, where only 10% of organizations have developmental processes to support the implementation of these projects. In researching this community, greater emphasis was found on efficiency benefits rather than those associated with effectiveness. Few organizations have processes for benefits management (as they do for costs), which is affecting IT project implementation. It is recommended to position performance indicators prior to project implementation (Bennington & Baccarini 2004, p. 28).

2.3.1.6 Conceptual cost estimating

Kwak et al. (Kwak, Watson & Anbari 2008) explore the role that a cost estimating framework can play in 'forcing' managers to consider factors during its early conceptual and development stages (that may otherwise be ignored). By identifying such factors, resources can be focused on the most effective areas during project deployment. The understanding that the results of cost estimating can generate can be used as input into risk analysis and risk-mitigation processes.

2.3.1.7 Early warning systems

Mavrotes et al. (2005) explore cash flow forecasting to manage funds in information and communications technology (ICT) projects. They consider forecasting as an early warning system (EWS) to detect any possible future problems in cash flow. By proactively making corrective movements, budget management

variations can be minimized—a critical activity when ICT projects have long project phases and short life cycles for technology. Budget planning and control are critical in such project environments (Mavrotas, Caloghirou & Koune 2005).

Sanchez and Perez (2004) further examine EWS as a way to hypothesize or predict variations in future project development. In this regard, they change the perspective of monitoring changes that have happened (a conventional method of control) to what might happen. EWSs rely on clear understanding of specific projects and their objectives in order to develop a framework of what can lead to project success. (Both quantitative and qualitative measures can be used.) Signals such as project costing, time deviations and achievement of technical goals were most frequently used as indicators of variances (Sanchez & Perez 2004, p. 13).

2.3.2 Process control measured by specific instrumentation, methods and principles

Project management literature indicates that process control can be supported by the development of new tools and the incorporation of certain project management or operational methods and principles. Several researchers have explored these factors as part of the larger discussion concerning increased efficiency, productivity and profitability within project management practices. The following is a representative list from researchers and practitioners that examine specific tools and management methods and principles to increase or support process control.

- Measurement is the focus of Chang and Ibbs' research (1998), where they advocate its essential role in process control. In the investigation, measures are developed for achieving excellence with deliverables, processes, costing and schedules. The specific focus of this work is consultants working for government agencies or engineers in design projects.

- The use of a standardized module is the focus of Phillips' work (1999) where he advocates the completion of one module in significant detail. Contingencies are given special consideration (as factors that can arise in and influence other modules). From this single module, a standardized set of procedures can be developed for other modules. Increased efficiency and a more rapid overall progression are possible in larger projects.

- The Statistical Project Control Tool (Bauch & Chung 2001) has been developed specifically for engineering project managers. Consisting of modified Shewhart Control Charts, its purpose is to determine if project processes are under statistical control in the areas of time, cost and technical performance. The monitoring of different projects is possible with this tool.

- The Analytical Design Planning Technique addresses the iterative nature of the design processes within construction projects. Researchers have considered the importance of the information flow and the use of models (Austin 2000; Austin et al. 2002) to improve process efficiency.

- 'Constant Work-in-Progress' is a production principle explored by Anavi-Isakow and Golany (2003). By considering the push principle (no control over the number of products in the system) with pull mechanisms (allowing new work to enter only when production system signals readiness) in a multi-project environment, the authors identify the benefits of the pull model. These benefits include easier monitoring of projects in the system, easier forecasting of completion times and positive effects on productivity.

- The use of 3-D animation based on geographic information systems is the focus of Bansal's work (2010). Examining the construction industry, he emphasizes the need to partner safety planning and project execution to convey what is to be built, what safety measures are necessary, when, where and why. By using a GIS-based navigable 3D animation in the safety planning process, users can increase their understanding of the construction sequence and predict places and activities that have higher potential for accidents or variations.

- A Multi-dimensional Project Control System (MPCS) is proposed as a quantitative approach to quantifying deviations associated with the planning of project execution (Rozenes, Vitner & Spraggett 2004). Earned value integrates cost and schedule, but other dimensions such as quality, technology and operations are not included in the system and must be controlled using other factors. MPCS integrates all known dimensions of a project, assigns weights, and presents project performance in all operational facets. Attention can be drawn to project variations and acted on accordingly by the project manager.

2.4 Defining project management maturity

Definitions of project management maturity vary within the project management literature. As the first two of these quotes suggest, it can have positive characterizations that indicate a real possibility of achievement by organizations developing and improving their project management capability. Andersen and Jessen (2003), on the other hand, offer a less encouraging perspective.

> *Maturity in project management is the development of systems and processes that are repetitive in nature and provide a high probability that each project will be a success.*
> (Kerzner 2004, p. 34)

> *Project management maturity is the sophistication level of an organization's current project management practices and processes.*
> (Ibbs, Reginato & Kwak 2004, p. 1216)

> *In the real world, we will not find the fully matured organization; no one has reached the stage of maximum development and no one will.*
> (Andersen & Jessen 2003, p. 457).

Despite these differences of opinion, process control dominates current definitions of project management maturity, the maturity models used to assess it and, consequently, the perception of both. This is an important point insofar as 'perceptions' have lead many practitioners to limit their views of a 'mature' project management capability only to those processes that can be strictly defined, repeated and well-managed.

The validity of this perspective lies at the heart of this inquiry – why should strictly defined and controlled processes be the only metrics that indicate the overall health of the project management capability? Could other factors also play a part? The answer to this question can partly be found in exploring the varied definitions of project management maturity within the project management literature.

Three views of project management maturity dominate current literature:

- The technical meaning associated with capability maturity models that positions 'project management maturity' as the extent to which an organizational project management capability has explicitly and consistently deployed processes that are documented, measured, controlled and continually improved (Cooke-Davies 2004a, p. 5). This definition is in consistent with capability maturity model definition

introduced by SEI/CMM. On this basis, a project management capability (consisting of these processes) is considered more or less ‘mature’ depending on its demonstration of these processes.

Implicit in the dominant, process-oriented view of project management maturity are multiple assumptions: there is a known and predictable group of processes that support project management; that these processes will behave predictably in a controllable system, thus minimizing variations and increasing efficiency (Cooke-Davies 2004a, p. 4). Kerzner’s ‘16 points’ (2006, p. ii) approach is an example of an industry leader who promotes a prescriptive approach to project management maturity based on such a strict definition of project management maturity (see Table 2-1).

Table 2-1: Kerzner's 16 Points to PMM (Adapted from Kerzner, 2006, ii)

Dr. Kernzer's 16 Points to Project Management Maturity

1. Adopt a project management methodology and use it consistently.
2. Implement a philosophy that drives the company toward project management maturity and communicate it to everyone.
3. Commit to developing effective plans at the beginning of each project.
4. Minimize scope changes by committing to realistic objectives.
5. Recognize that cost and schedule management are inseparable.
6. Select the right person as the project manager.
7. Provide executives with project sponsor information, not project management information.
8. Strengthen involvement and support of line management.
9. Focus on deliverables rather than resources.
10. Cultivate effective communications, cooperation, and trust to achieve rapid project management maturity.
11. Share recognition for project success with the entire project team and line management.
12. Eliminate nonproductive meetings.
13. Focus on identifying and solving problems early, quickly, and cost-effectively.
14. Measure progress periodically.
15. Use project management software as a tool—not as a substitute for effective planning or interpersonal skills.
16. Institute an all-employee training program with periodic updates based upon documented lessons learned.

- Saures (1998, p. 362) regards project management maturity as 'the organizational receptivity to project management.' Hartman and Skulmoski (1998) extend project management maturity from focusing predominantly on actions (i.e. processes) to one where competence and maturity are knitted together to increase project success. In such organizations, project managers are permitted to do what is necessary to manage their projects properly.

- Andersen and Jessen (2003, p. 458) posit a broader view of maturity, where maturity is best explained as the sum of action (ability to act and decide), attitude (willingness to be involved), and knowledge (an understanding of the impact of willingness and action).

However, as the opening quotes to this section encapsulate—and is reinforced by Saures (1998), Andersen and Jessen (2003) in particular—a widely supported definition of 'maturity' does not exist. It can be a unique interpretation, not just a prescribed universal standard. Characterization of the project management capability can be equally as important as control of its processes. As these definitions suggest, 'maturity seems to be a fairly diffuse, intangible concept' (Saures 1998, p. 362). With this in mind, further observations from the literature show that, while 'maturity' is embraced as a goal for an evolving discipline, it can manifest from subjective or specialized elements within organizations that are not necessarily highly definable or repeatable:

- Involvement of the project sponsor is critical to delivering project results and supporting project management maturity (Cooke-Davies 2005).
- Training and mentoring can support project management maturity (Skulmoski 2001).
- Satisfying known bodies of knowledge also contribute to the achievement of increased maturity levels (Hillson 2003).

2.5 Maturity models as capability assessment tools

Whilst the concept of maturity is diffuse and intangible, maturity models are the assessment tool by which maturity can be assessed. Cleland and Ireland (2002, p. 284) argue that the widespread development and use of this tool came as a result of various efforts for improving organizational capability: the total quality management movement of the 1980s, Philip Crosby's book *Quality is Still Free* (1979), the Deming Prize (within Japan) in 1950, and the 'Malcolm Baldrige National Quality Award Program' in 1987.

The models themselves came in two waves: the first being the *Quality Management Maturity Grid* (Crosby 1979) and the SEI/CMM as an extension of *Managing the Software Process* (Humphrey 1989). While both explore aspects of 'maturity,' there are key differences. This section will explore both model types.

2.5.1 The Quality Management Maturity Grid (QMMG)

The first model developed to assess maturity was the Quality Management Maturity Grid (Crosby 1979), describing expected behaviour of a firm at five levels of maturity—Uncertainty, Awakening, Enlightenment, Wisdom, and Certainty (see Table 2-2). Its purpose was to help management and employees understand and plan for quality management by indicating what goes on (or should go on) inside an organization committed improving quality (Crosby 1996, p. 36).

The QMMG was promoted as a way to quickly and accurately indicate where an organization stood (or could stand) from a quality perspective (Crosby 1979, p. 30). From an operational perspective, it provided management with an opportunity to identify, even codify, practices or processes considered effective or 'best' suited for the capabilities in specific areas.

The Grid encourages managers to see quality holistically, as a management problem rather than a technical activity (Crosby 1979, p. 31). Managers were encouraged to assess their organization's location on the Grid and then, once found, to follow subsequent stages described by the grid toward heightened levels of maturity. In a case where deterioration was occurring, users were instructed 'to read the Grid backwards' and locate the last point of success (Crosby 1979, p. 38).

Table 2-2: Quality Management Maturity Grid (Adapted from Crosby 1979, p. 36-37)

	Stage 1: Uncertainty	Stage 2: Awakening	Stage 3: Enlightenment	Stage 4: Wisdom	Stage 5: Certainty
Management understanding and attitude	No comprehension of quality as a management tool. Tend to blame quality department for "quality problems."	Recognizing that quality management may be of value but not willing to provide money or time to make it all happen.	While going through quality improvement program, learn more about quality management, becoming supportive and helpful.	Understand absolutes of quality management. Recognize their personal role in continuing emphasis.	Consider quality management an essential part of company system.
Quality organization status	Quality is hidden in manufacturing or engineering departments. Inspection probably not part of organization.	A stronger quality leader is appointed but main emphasis is still on appraisal and moving the product. Still part of manufacturing or other.	Quality department reports to top management, all appraisal is incorporated and manager has role in management of company.	Quality manager is an officer of company; effective reporting and preventive action. Involved with consumer affairs and special assignments.	Quality manager is on Board of Directors. Prevention is main concern. Quality is a thought leader.
Problem handling	Problems are fought as they occur. Inadequate definition; lots of yelling and accusations.	Teams are set up to attack major problems. Long range-solutions are not solicited.	Corrective action communication established. Problems are faced openly and resolved in an orderly way.	Problems are identified early in their development. All functions are open to suggestion and improvement.	Except in the most unusual cases, problems are prevented.
Quality improvement actions	No organized activities. No understanding of such activities.	Trying obvious "motivational" short-range efforts.	Implementation of the 14-step program with thorough understanding and establishment of each step.	Continuing the 14-step program and starting Make Certain.	Quality improvement is a normal and continued activity.
Summation of company quality posture	"We don't know why we have problems with quality."	"Is it absolutely necessary to always have problems with quality?"	"Through management commitment and quality improvement we are identifying and resolving our problems."	"Defect prevention is a routine part of our operation."	"We know why we do not have problems with quality."

2.5.2 Capability maturity models: Descendants of the QMMG

More than a decade after the launch of the QMMG, discussion on maturity models continued. Originally conceived by Watts Humphrey (1989), the SEI/CMM and its successors were designed as tools to assist American Department of Defense to objectively assess contractors' processes in performing contracted software projects. The model provided terminology and best practices to enable acquirers of information system/technology projects to assess contractor capabilities.

The CMM model embodies a simple principle: if organizations wish to develop predictability and repeatability in their processes, process areas needed development (Cooke-Davies & Arzymanow 2003, p. 3). By achieving this satisfactorily—maintaining SPC—progress could be measured, monitored, controlled and improved. With the enumeration of specific progress criteria with prescribed maturity levels, ascension or decline could be identified.

The basic levels within the SEI/CMM have come to serve as the foundation for many other models within project management, across industry and knowledge domains. The language used within the SEI/CMM is consistent with the principles of SPC (Section 2.2.2.3) and is summarized in Table 2-3:

Table 2-3: Process maturity principles as codified within CMM (Adapted from Humphrey 1989)

Initial	The process is characterized as *ad hoc*, and occasionally even chaotic. Few processes are defined, and success depends on individual effort.
Repeatable	Basic project management processes are established to track cost, schedule, and functionality. The necessary process discipline is in place to repeat earlier successes on projects with similar applications.
Defined	Processes are documented, standardized, and integrated into a standard process for the organization. All projects use an approved, tailored, version of the organization's standard process for developing and maintaining software.
Managed	Detailed measures of the processes and product quality are collected. Both the process and products are quantitatively understood and controlled.
Optimizing	Continuous process improvement is enabled by quantitative feedback from the process and from piloting innovative ideas and technologies.

The language of capability maturity models and the QMMG differ. The QMMG 'only works when taken literally, without rationalization or transposition' (Crosby 1996, p. 37). While structured as a five-level model, measurement categories contain behavioural and attitudinal focal points, general observations, and predictions of quality costs. Many of these elements do not revolve around specific processes or process areas. Unlike CMMs, the QMMG lends itself to greater applicability (to more organizational types) rather than adoption with the requirement for it to be taken literally.

Drawing heavily on the concept that every process has a natural (and accompanying) capability that can be assessed and improved, the SEI/CMM embodied a simple principle: organizations wishing to develop predictable, defined, and repeatable capabilities, a number of process areas (each consisting of a family of related processes or practices) need development.

Each of these processes can develop through a series of stages of maturity from informal at the lower end of the scale to more highly sophisticated state (hence the principle of continuous improvement) embedded in the higher end of the maturity scale (Cooke-Davies 2004a). Thus 'maturity' is used in CMMS in the very specific sense to mean 'the extent to which an organization has explicitly and consistently deployed

processes that are documented, managed, measured, controlled, and continually improved' (Cooke-Davies 2004a, p. 3).

The influence of the CMM approach has been significant on project management maturity models, with many reflecting its staged design, lexicon, and key principles. The next section deals exclusively with project management maturity models and will explore this influence and other issues.

2.6 Project management maturity models

A universally accepted view of project management maturity does not exist (as shown in Section 2.4). A similar lack of consensus exists for the current generation of project management maturity models – with their purpose, design and value being the subject of ongoing discussion. From within this literature, general agreement can be found quite narrowly on two issues.

First, improving project management capabilities is desirable. Multiple researchers echo the view that project management has become an integral element to myriad industries and organizations as an instrument to support change (Andersen & Jessen 2003; Cooke-Davies & Arzymanow 2003; Kwak & Ibbs 2002; Pennypacker & Grant 2003). Despite the apparent reasonableness of this view, there is no agreement on what a fully mature project management capability looks like (again, as explored in Section 2.4), which brings us to the second concord.

Whilst no organization has reached (or will) reach this state, 'it is reasonable to speak in measures and characterizations' of maturity … a 'dialogue' facilitated by maturity models that can, in theory, capture the project management dimensions to be addressed in an organization (Andersen & Jessen 2003, p. 457; Pennypacker & Grant 2003, p. 5). The project management maturity assessment can provide a methodological and deliberate mechanism of the competency health of an organization in a detailed, objective and formalized fashion (Rad & Levin 2006b, p. 4).

However, this is where the consensus ends. Cooke-Davies (2002) and Skulmoski (1999) both contend that no one model is good for all projects and claims about their capacity to add value are increasingly challenged. A review of the literature addressing motivations for their use, criticisms of their value, and design issues is explored below.

2.6.1 Motivations for use

The view advocating project management maturity models is that they provide a structure for an organization to follow that will lead to more efficient and effective operations (Cleland & Ireland 2002; Cooke-Davies 2004b; Hillson 2003).

They are designed to provide the framework that an organization needs to purposefully and progressively develop its capability to deliver projects successfully and repeatedly (Pennypacker & Grant 2003). Organizations that embark on improving their capability by following some maturity model can benefit by improved project performance, improved marketing opportunities and a structured path to improvement (Skulmoski 1999). The model itself will provide the incentive and roadmap for development of formalized project portfolio management, a library of best practices and a project team pool of competent and qualified project team professionals (Rad & Levin 2006b).

Pushing an organization toward improvement and verification of that improvement 'must come, implicitly and explicitly, from within' (Rad & Levin 2006b, p. 1). And the most common forces for initiating that push are: capital projects, customer expectations, competitiveness, executive understanding and buy-in, new product development, efficiency and effectiveness and survival (Kerzner 2004; Rad & Levin 2006b).

2.6.2 Criticisms

Criticisms of project management maturity models can be read and inferred from various sources. Jugdev and Thomas (2002) offer the most thorough and critical assessment, but others have contributed to the debate. The following summarizes these observations under the key claims identified by Jugdev and Thomas. (Additional references are provided that reinforce the observations of Jugdev and Thomas.)

- Maturity models are concrete, tangible ways of systematically assessing aspects of a firm's project management maturity.
    - The structure of a model determines the dimensions to be addressed, but this introduces clear limits to the 'maturity' achievable by a firm and their possible areas of growth.
    - The maturity levels (as per Table 2-3) do not offer enough granularity to measure progress.

- With their emphasis on standard project management bodies of knowledge, they can be overly disciplinary, impractical and overwhelming as methodologies.
- Their complex structure can make assessments difficult to perform, interpret and implement (Hillson 2003).

- Maturity models help compare explicit competences at the project and program level relative to a standard.
  - Models typically capture explicit knowledge (the 'know-what') as documented in the model levels without capturing intangible assets and implicit knowledge (Hillson 2003).
  - They focus on work processes and often ignore the human resource or organizational aspects.
- Maturity models enable firms to achieve a competitive advantage.
  - Models are static instruments that do not account for the rapid pace of change affecting firms (especially concerning technology or new processes, practices, policies or management systems).
  - Models are typically geared toward identifying a problem and raising awareness, but not solving it.
  - Using maturity assessment data for benchmarking purposes (to facilitate competitive analysis) is only valuable for those industries and organizations that support competition.

2.6.3 Design analysis

A list of project management maturity models in common use can be seen in Table 2-4. Designed either from within the project management community or by specific industries or organizations requiring a dedicated project management capability, Cooke-Davies (2002, p. 3) defines three types:

- those that assess **project management processes** general reflect knowledge areas such as those contained within the PMI PMBoK guide (2004) but with the adoption of some variant of the CMM model;
- those associated with **technical delivery processes** (e.g. software development) and assessed through a series of five discrete stages (performed, managed, defined, quantitatively managed and optimizing); and,

- those that relate to **total organizational maturity** and allow individuals organizations to assess the maturity of processes on individual projects.

2.6.3.1 Focus, assessment methods and model styles

Models can be analyzed using a combination of characteristics. For the purposes of this research, these elements are:

- **Target**: the intended industry, organization, or knowledge domain where the model is meant for application.
- **Assessment focus**: the capability focused on by the model's assessment.
- **Assessment method**: distinguishing between 'continuous' and 'staged' models. The former establishes a baseline for an organization through an assessment: specific elements are then used as criteria to establish what will be improved and at what rate. The latter using a 5-step model that establishes criteria for each step where each is considered essential to project maturity and given similar weight for improvements (Cleland & Ireland 2002).
- **Model style:** basic design where a '*CMM-like model*' identifies process areas organized by common features which specify a number of key practices to address a series of goals or global descriptions.

Table 2-4 illustrates that the generation of project management maturity models currently dominating industry and government. A mixture of 'continuous' and 'staged' models are in use. The widespread use of 'staged' models indicates an impulse by myriad organizations to follow a more prescriptive approach to project management maturity assessment. While the content may vary slightly—although most rely on the PMBoK areas (Hillson 2003)—clearly a reliance is placed on following the pre-determined dimensions that organizations must follow to be assessed (Pennypacker & Grant 2003).

Table 2-4:Basic characteristics of project management maturity models (Pasian, for this research)

Name	Target	Assessment Focus	Method	Model style
Construction Project Management Maturity Model (Fengyong & Renhui 2007)	Construction	PM	Staged	CMM-style
Evolutionary Software Project Management Maturity Model (Sukhoo, Banard & Van der Poll 2007)	Software development	PM	Staged	CMM-style
P3M (OGC 2006a)	Multiple	PM	Staged	CMM-style
Prince2 Maturity Model (OGC 2006b)	Multiple	PM	Staged	CMM-style
The Project Management Maturity Model (Crawford 2006)	Multiple	PM	Staged	CMM-style
OPM3 (PMI 2003)	Multiple	Organizational	Continuous	Multi-dimensional
Project management Process Maturity (PM)2 Model (Kwak & Ibbs 2002)	Multiple	PM	Staged	CMM-style
Strategic Project Management Maturity Model (Kerzner 2001)	Multiple	PM	Staged	CMM-style
ProMMM (Hillson 2001)	Multiple	PM	Continuous	CMM-style
Open Maturity Model (Lubianiker, 2000)	Multiple	PM	Staged	CMM-style

2.6.3.2 Content and ascension design

Two other key characteristics of these models are their content and the ascension design (see Table 2-5) – both of which are integral to the determination of maturity:

- **Content**: the processes and practices used by the model to assess project management maturity. References to 'PMBoK' are specific to the Project Management Institute's methodology: *Project Management Body of Knowledge*.
- **Ascension design**: the path for model users to follow in their ascent toward project management maturity.

Ascension along a maturity scale is marked by the satisfactory demonstration of processes and practices identified in Table 2-5. Alternatively, Rad and Levin (2006a) advocate the use of a metrics approach that

can indicate whether or not the environment is project-friendly, establish a baseline for continuous improvement, and, ultimately, to serve as a tool to determine whether the effort associated with improvements in project management practice is increasing, decreasing or staying the same.

Such metrics can be categorized. Rad and Levin (2006a) promote those identified by Florac, Park and Carleton (1997): performance, stability, compliance, capability, and improvement. Such categories associate with maturity levels based on 'loose relationships' with things, people and enterprise. Increasing levels of maturity demonstrate greater use of things (on the basis of performance), people (compliance and stability) and enterprise (capability and improvement) (2006a, p. 286). Immature organizations will focus on the 'things' aspects of the project, while a more mature organization will have a stronger balance of things, people and enterprise components (2006a, p. 287).

To support organizations with higher levels of maturity, Rad and Levin (2006a, p. 281) recommend a customized metric system (that can help avoid expensive and time-consuming maturity assessments): one that is driven by business goals; consistent across the organization; adaptable to specific user needs; focused on collecting data as directly as possible; compliant with operational data collection policies; and supported by all affected parties, including the client (O'Hara and Levin, 2000).

Table 2-5: PM models: Content and ascension design (Pasian, for this research)

Name	Content	Ascension design toward maturity
Construction Project Management Maturity Model	Combination: PMBoK areas and unique to this model	5 levels: Initial, Repeatable, Completely organized, Quantitatively managed, Optimizing
Evolutionary Software Project Management Maturity Model	Similar to PMBoK knowledge areas	3 levels: Initial, Basic project management, Organizational level
Project management Process Maturity (PM)2 Model	Similar to PMBoK knowledge areas	5 levels: Ad-hoc, Initial Project Planning, Systematic Project Planning & Control, Integrated Multi-Project Planning and Control, Continuous improvement
Open Maturity Model	Similar to PMBoK knowledge areas	10-step process: Commitment, Team building, Calibration, Preparations, Assessments, Analysis & Verification, Management Review, Improvements Plan, Implementation, Reassessment
OPM3	Combination of PMBoK areas and those defined by organization (through assessment)	Multidimensional: project, program, and portfolio upwards along the levels of standardization, measurement, control and continuous improvement
P3M3	Similar to PMBoK knowledge areas	5 levels: Awareness, Repeatable, Defined, Managed, Optimised
Prince 2	Partial version of P3M3	3 levels: Initial, Repeatable, Defined
Project Management Maturity Model	Similar to PMBoK knowledge areas	5 step ladder: Initial, Structured Process and Standards, Organizational Standards and Institutionalized Process, Managed Process, Optimizing Process
ProMMM	Areas defined by organization (through assessment)	4 levels: Naïve, Novice, Normalised, Natural
Strategic Project Management Maturity Model	Combination of PMBoK areas and those defined by organization (through assessment)	5 levels: Common language, Common Processes, Singular Methodology, Benchmarking, Continuous Improvement

In large measure, the above sections (starting with 2.4) offer conceptual descriptions of both project management maturity and the models that assess it. The review is now going to shift to offer a 'real world' perspective – one that looks at industry use of these maturity models against a typological framework and associated implications.

2.7 Maturity assessments within a project typology framework

Since 1998, multiple project management maturity assessments have occurred, focusing on individual industries and making comparisons between them. Table 2-6 summarizes a selection of these studies and identifies the industries of interest.

Table 2-6: Summary of PM maturity industry assessments (Pasian, for this research)

Authors(s)	Industries of interest
(Mullaly 1998)	Business services, Utilities, Engineering, Financial services, Government, Health services, High technology, Insurance, Manufacturing, Oil & Gas, Retail, Aerospace
(Cooke-Davies & Arzymanow 2003)	Pharmaceutical, Telecommunications, Defence, Financial services, Construction, Petrochem
(Dinson 2003)	Software
(Fussinger 2006)	Public services, Engineering / Construction, Consulting
(Ibbs & Kwak 2000)	Engineering / Construction, Information Management, Telecommunications, Manufacturing
(Ibbs, Reginato & Kwak 2004)	Engineering / Construction, Information management, Information systems, Manufacturing
(Supic 2005)	Manufacturing, Software
(Grant & Pennypacker 2006)	Manufacturing, Information, Finance & Insurance, Professional Science & Technical Services
(Mullaly 2006)	Government, Communications, Transportation
(Padman, Ganesh & Rajendran 2008)	Software

Reconciling the project types associated with these industries against the Turner and Cochrane Goals-and-Methods matrix (1993), many of the industries which have been researched manage projects which fit into the 'Type-1' category (see Table 2-7). 'Industries of origin' (such as engineering and construction) along with newer adopters of project management practice (pharmaceutical) all manage projects where the goals and methods are either well-defined or not left to chance (Cooke-Davies & Arzymanow 2003; Ibbs & Kwak 2000).

Table 2-7: Turner & Cochrane Goals-and-Methods Matrix (Turner & Cochrane, 1993)

Type	Description
Type-1 (Earth)	In these projects, the goals and methods are well-defined. Typified by large engineering or construction projects, they can also be called 'earth' projects (given their clear definitions and solid foundation).
Type-2 (Water)	The goals are well-defined in these projects but the methods of achieving them are not. Exemplified by product development projects, they are considered 'water' projects: they flow with a sense of purpose but in a haphazard way.
Type-3 (Fire)	In these projects, the goals are not well defined, but the methods are. Typified by software-development projects, the goals are known to exist but cannot be specified precisely until users begin to see what can be produced, often during the testing stages. From an elemental perspective, these projects are known as 'fire:' they can burn but with no apparent purpose.
Type-4 (Air)	In these projects, neither the goals nor the method of achieving them are clear. Typified by organizational-development projects, they can be classified as 'air' projects: they are difficult to catch and deliver 'blue-sky' research results.

Examining the other Turner and Cochrane project types, the expectations and possible conclusions concerning project management maturity assessments are less certain. Process maturity principles would suggest that the project management capability associated with Type-3 projects, for example, would be immature. The minimal (or total absence, depending on the project) of 'goals definition' would suggest that ambiguity or uncertainty within these project management practices could be inconsistent with the achievement of project management maturity that relies on process control (using repeatable, definable and well-managed processes). One could even go so far as to suppose that all project types outside of Type-1 do not have mature project management capabilities because of their undefined characteristics.

Reinforcing this possibility is the fact that maturity models have been developed for projects and initiatives associated with Types-2, -3 and -4 that rely on processes and practices that are not necessarily repeatable[5]. Figure 2-5 illustrates the distribution of dozens of maturity models[6] across the Turner and Cochrane typology. Clearly, industries and organizations have considered their own view of 'maturity,' the requirements to achieve it and codified both. (The following paragraphs consider a few examples.)

[5] See Section 4.3.2.1 for analysis of model properties.

[6] See Appendix #2 for list of maturity models included in this analysis.

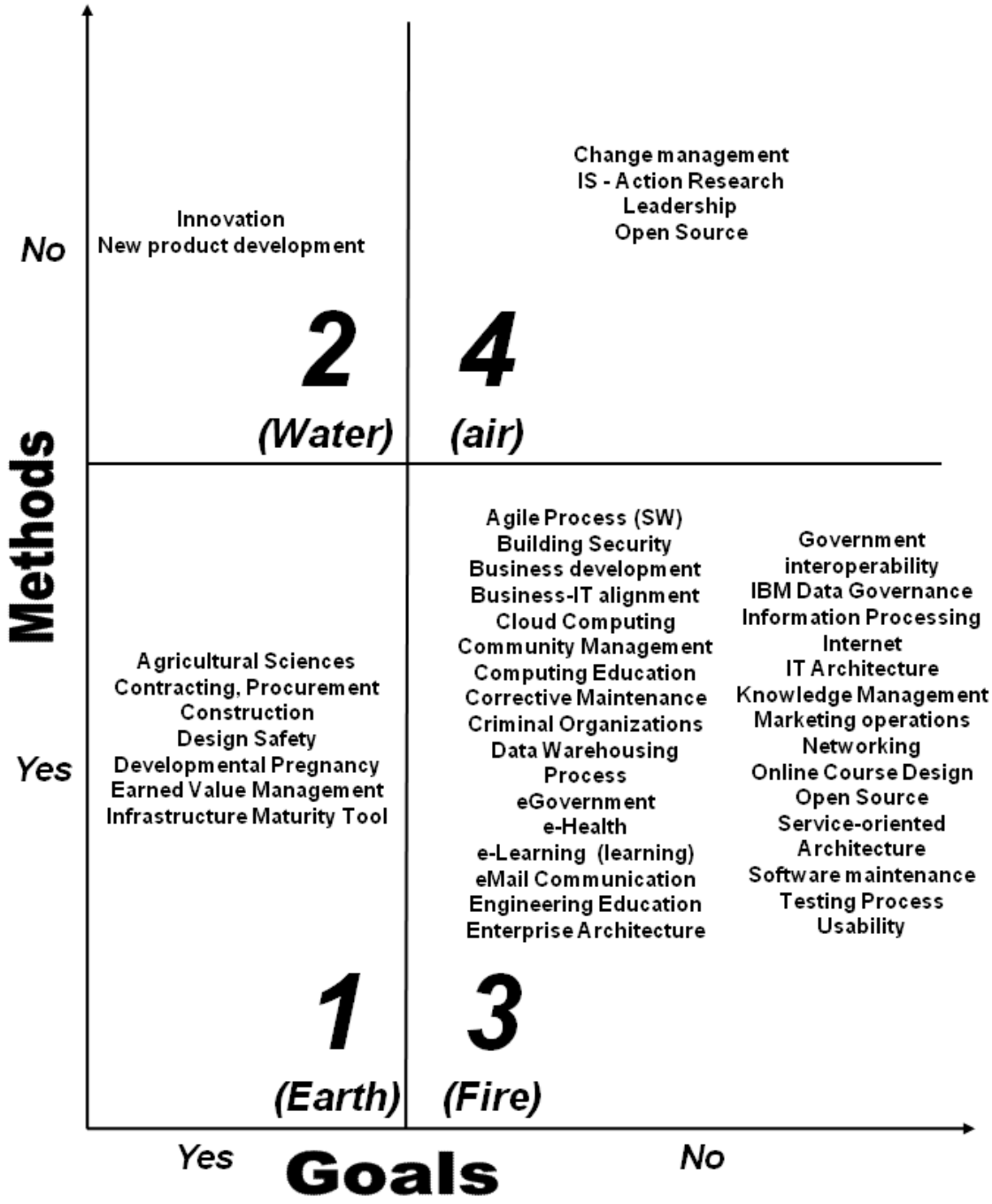

Figure 2-5: Placement of maturity models in Turner & Cochrane typology (Pasian, for this research)

An organization reliably managing Type-1 projects (in this case, construction) has its process maturity partly assessed on the basis that these processes are repeatable. In an environment characterized by highly defined projects (in terms of both goals and methods), an organization's ability to repeatedly manage these projects reliably is both reasonable and desirable. It's reasonable that an organization develop processes with little or no variation (which leads to greater efficiency and productivity). It's desirable for clients (current and future) to benefit from an organization whose reliability has been successfully developed based on mastering repeatable processes.

Using a constructive maturity model as an example, one can see the reliance on repeatability as a measure of process maturity. Fengyong and Renhui (2007, p. 10) identify repeatability in level 2 (of 5 levels) indicating that 'the enterprise realizes the necessary [ed: necessity] of defining and developing the generic processes' in order to attain maturity.

Type-2 projects are described as having highly defined goals and undefined methods. 'Repeatable' processes for this project type are illogical and should be less expected within a project management capability. New product development (NPD) is a representative project type in this quadrant.

Results of an inquiry into maturity in the NPD processes offered by Dooley, Subra and Anderson (2001) indicate that the presence of defined, managed, measured and continually improved NPD processes is correlated with project success. These conclusions indicate that not only are repeatable processes likely in an NPD organization but contributory toward a successful outcome.

Clearly, a discrepancy exists between the 'Type-2' characterizations and the industry-specific practices. A maturity assessment of NPD processes affirms the value of definability and repeatability for a project type categorized by the absence of these qualities. NPD organizations understand their processes in a way that justifies the inclusion of repeatability as a step toward maturity. A reasonable conclusion concerning this project type is that their categorization (in the Turner and Cochrane typology) does not reflect how maturity is assessed in the organizations managing those projects.

Type-3 projects also lack definition, but for this type it concerns their goals (and not their methods which are well-defined). Like Type-2 projects, the logical extrapolation would be that repeatability is not an inherent element of the management of projects in this category. Moreover, the expectation of maturity models for this project type would not emphasize (or possibly exclude) 'repeatability' as a level toward

maturity. Maturity (on the basis of current project management maturity models) is unlikely in an organization that cannot repeat processes for projects where the outcomes are likely to be different.

A review of several maturity models for software development projects (the representative type identified in the Turner and Cochrane matrix) indicate, however, that repeatability is in fact a necessary step toward maturity. A study of the impact of the CMM model on Indian software firms indicated that 'CMM companies scored higher values' (Padman, Ganesh & Rajendran 2008, p. 31).

In a similar investigation of the suitability of the maturity model on data management and data warehousing, Sen et al. (Sen, Sinha & Ramamurthy 2006) endorse its use. In building the Data Warehousing Process Maturity Model, the investigators identified 'Level 2' as the repeatable level, followed by 'defined' at Level 3. While seemingly an illogical sequence, this maturity model does reinforce the value acknowledged by organizations in the software-related community that repeatability is an important step toward process maturity. Again, inconsistent with the definition of Turner and Cochrane's Type-3 project.

The last of the Turner and Cochrane matrix, Type-4, lacks definition along both its goals and methods dimensions. Clearly, 'repeatability' cannot be a reasonable expectation for this project type (which includes research and organizational change among its representative projects).

A sample of maturity models corresponding with Type-4 projects reveal inconsistencies in themselves. One 'maturity framework' offered by Narayanan (2005) to measure innovation maturity is unclear on the principle of 'repeatabilty.' It emphasizes that innovation is a process, not a single event and open to manipulated influences which might explain why 'definability' is only suggested as a second level (called 'Recognized' in the model).

2.8 Conclusions

Process control is a foundational principle of quality management. Architects and advocates for TQM have argued (for decades) the necessity and associated benefits of monitoring and minimizing process variations in order to achieve optimum system outputs. By minimizing variations, processes could be under statistical control, considered definable as capabilities, open to repeatability and, ultimately, a

contributing factor to greater efficiency. In the growing American and Japanese economies (post World War II) where manufacturers were attempting to re-tool their systems and outputs to serve a civilian customer base (as opposed to a military one), process control as a managerial priority made enormous sense. Control, definability, repeatability, and predictability—these qualities were seen as appropriate and effective standards to support businesses as they served customers.

Moving ahead 40 years, organizations that increased their use of formal project management methods became interested in continuously improving their project management capability—motivated by the idea that tightly defined, repeatable and predictable processes could directly contribute to efficiency of their organizational systems. The adoption of these principles within the project management community resulted in a view of project management maturity rooted in process control, with an entire generation of project management maturity models designed to reflect these principles (as originally codified by the SEI/CMM).

Against the backdrop of this process-oriented view of project management maturity, several issues arise:

I. The variety of project types and project management environments has greatly extended beyond manufacturing—the era in which process control emerged. While the need to achieve workplace efficiency was necessary to manufacturers, can the same be said for all organizations and industries that have increased their use of project management? Would other values or motivations, such as customer satisfaction or others articulated with the organization's vision or mission statements, contribute to chosen project management methods and, ultimately, the maturity of the capability?

II. To accept the idea that new (i.e., undocumented in current project management maturity models) processes and practices can affect project management maturity, is it not also possible to conclude that interpretations of maturity can be context-specific to reflect these factors?

III. The variety of content presented in the current generation of project management maturity models (see Tables 2.4 and 2.5) indicates different project management processes used to assess a project management capability and improve upon it. Could these processes be further expanded upon to reflect unique qualities specific to organizations or industries? Again, examining the design and content of maturity models outside of project management, informal practices have

contributed to definitions of maturity. What non-process factors within an organization—and possibly unrelated to project management—could affect its maturity?

IV. Table 2.4 indicates a reliance on the SEI/CMM model in the design of project management maturity models, indicating a widespread support of the standards of definability, repeatability and predictability to demonstrate project management maturity. Other maturity models have used different principles (and ascension levels) to determine 'maturity' – could other principles be germane to assessing project management capabilities and determining their status?

Based on published maturity assessments, it has been shown 'Type-1' projects (those associated with 'industries of origin') are often characterized as having mature project management capabilities (see Section 2.7). This is internally consistent in that one would expect industries relying on highly defined goals and methods—construction, engineering and architecture, for example—to define, repeat and predict processes that will increase the likelihood of efficiency and productivity.

V. But what about project types categorized differently? When reconciling the process-dominant view of project management maturity against projects lacking definable qualities, a disconnect emerges. 'New' project management environments (as opposed to those within 'industries of origin')—such as within Type-3—are demonstrating project management processes that are undefined, uncontrolled, and, consequently, unpredictable. Maturity models from industries and organizations representing the Types-2, -3 and -4 quadrants have shown that, through their design and content, maturity can be accomplished to accommodate their undefined goals or methods.

VI. Projects lacking definition—therefore differing from project to project—may engage unique processes and practices in their management. These 'unique' processes are, by definition, unlikely to be repeatable and predictable (again, from project to project). Are the associated project management capabilities 'immature' or, by using processes, practices or other enablers that do not lend themselves to definability, repeatability, and predictability, simply taking an alternative route toward a reliable project management function? These developments suggest a flexibility of the project management maturity model as an instrument that could measure

processes that are less defined. Could these project management capabilities be mature despite the fact that their processes cannot be easily *controlled*?

2.9 Statement of the problem

The management of undefined projects postulates a sequence of events where the definition, repeatability and predictability of processes cannot be reasonably expected. This will, naturally, affect the reliability of the associated project management capability and perceptions of its maturity. The challenge to project management maturity theorists and practitioners is to recognize the possibility of project management maturity in an environment characterized by undefined project elements (goals and/or methods) and the requirement for greater flexibility in their management. Put another way, a key focus for this research is to integrate how the need to accommodate undefined project elements affect the assessment of a project management capability and the perception of its maturity.

In exploring this challenge and the issues raised in the Conclusions above (numbers i-vi), this inquiry will investigate the following research questions:

1) How can a Type-3 organization reliably manage a project with limited definability?

2) Can organizational-specific factors contribute to its project management capability and increasing maturity?

3) What non-process factors contribute to reliable project management capability?

4) Can interpretations of 'maturity' be context-specific (within a given organization, industry or knowledge domain)? What specific factors can contribute to these interpretations?

The next chapter will explain the multimethod research design to be used in answering these questions.

Chapter 3
The research design

3.1 Introduction

Methodological consistency is an essential element to any scholarly work. Within the project management community, the failure to meet this standard has been the focus of recent attention. Smyth & Morris (2007), in an in-depth examination of epistemological choices made by project management researchers, reviewed 68 papers published in 2005 (associated with the *International Journal of Project Management*) and made several conclusions:

- Research methodologies are being selected and applied inappropriately;
- Many authors fail to explicitly articulate their choice of research methodology; and,
- A result of these choices and exclusions is the challenge of locating the research in an epistemological and paradigmatic context.

Within the context of this research, an interpretivist orientation frames a multimethod research design. Such an approach has been found outside project management theory, where multimethod design has been implemented within organizational science (Esteves & Pastor 2004), information systems (Mingers 2001), and case study theory (Datta 1997). Its resonance here can be traced to Mingers' (2001, p. 243) who advocates the use of 'a strong pluralism…in the construction of a research framework' to reflect and serve the interests of an ontologically stratified and differentiated world. The case for a strong methodological pluralism will be made in this chapter.

Operationally, a multimethod design can serve the multidimensionality of this research by offering a unique research process that proceeds through many phases, undertaking many activities to focus attention on different aspects of the research (Esteves & Pastor 2004). Such a process is applicable here to reflect the maturity models (and the often competing views of reality they present) along with the unique perspective of organizations trying to manage undefined projects reliably.

Introducing this research strategy on the basis of the Smyth & Morris (2007) commentary is a deliberate act by this researcher. Applying a strategy of this type is new and unique to project management research: it needs to be shown to have integrity and consistency throughout. And lastly, the researcher must be held accountable (by herself and others) for implementing it effectively.

Beginning with a re-stating of the problem statement and research questions, the chapter will explore the interpretivist orientation of the research, describe the multimethod design as well as its implementation. The chapter will conclude by explaining the data analysis steps that will be taken along with the criteria for research quality (see Figure 3-1).

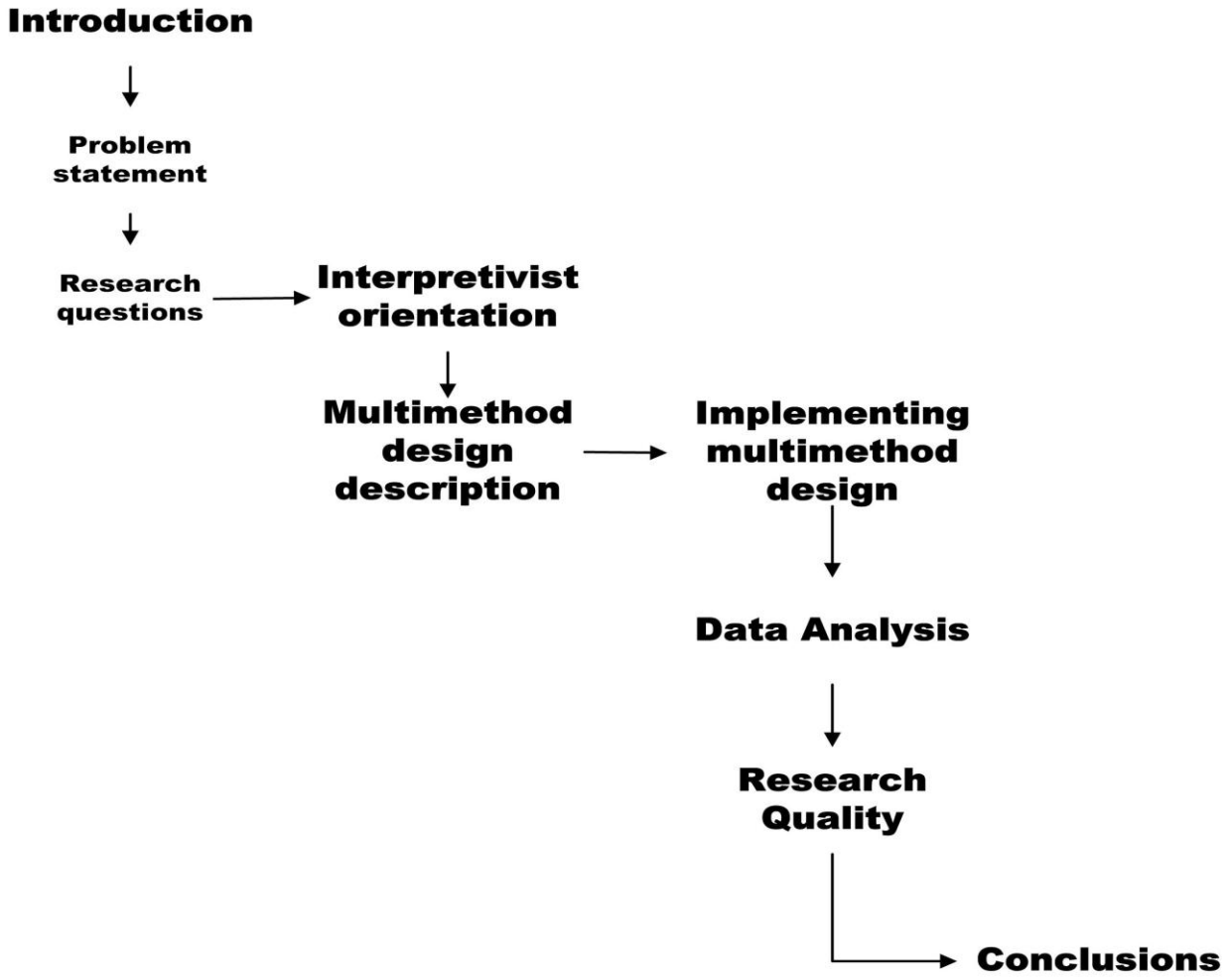

Figure 3-1: Pictorial outline of chapter (Pasian, for this research)

3.2 Statement of the problem

The management of undefined projects postulates a sequence of events where the definition, repeatability and predictability of processes cannot be reasonably expected. This will, naturally, affect the reliability of the associated project management capability and perceptions of its maturity. The challenge to project management maturity theorists is to recognize the possibility of project management maturity in an environment characterized by undefined project elements (goals and/or methods) and the requirement for greater flexibility in their management. Put another way, a key focus for this research is to integrate how the need to accommodate undefined project elements affect the assessment of a project management capability and the perception of its maturity.

3.2.1 The research questions

As detailed in Section 1.2, in exploring this challenge and issues in Section 2.8, this inquiry will investigate the following research questions:

1) How can a Type-3 organization reliably manage a project with limited definability?
2) Can organizational-specific factors contribute to its project management capability and increasing maturity?
3) What non-process factors contribute to reliable project management capability?
4) Can interpretations of 'maturity' be context-specific (within a given organization, industry or knowledge domain)? What specific factors can contribute to these interpretations?

3.3 An interpretivist orientation

The research questions identified above are primarily of an exploratory nature. In particular, they seek to examine the characteristics of an organizational project management capability, the processes and practices contributing to it, and the unique factors that allow it to be reliable. Moreover, consideration needs to be given to the unique, undefined project type that is the object of this project management function. Are there special dynamics, dimensions or characteristics to this project type that are consistent with and allow for the reliable application of a project management capability despite the undefined (or unrepeatable) nature of the project itself?

Clearly, there are a number of unknown factors. When this is the case, Neuman (1994, p. 18) points out that when little is known about a topic, and therefore everything is potentially important, exploratory research is 'more open to using a range of evidence and discovering new issues.' In describing the research paradigm of this exploration, the following sections will address questions concerning ontology (what is knowledge?), epistemology (what can be known?), and methodology (how can it be known)?

3.3.1 A qualitative approach

At the core of this research is an attempt to understand how organizations reliably perform a project management function despite managing projects with varying degrees of definability. Exploration within this inquiry does not depend on the expectation of finding a single objective reality. Several characteristics have been offered by Creswell (2003, p. 181) that support a qualitative approach to this exploratory inquiry (see Table 3-1).

Table 3-1: Characteristics of this qualitative strategy (Adapted from Creswell, 2003)

Creswell criteria	Relevance here…
Takes place in a natural setting	A management unit on a university campus.
Uses multiple methods	A multimethod design is in use to collect and analyze data using document analysis, case study and literature review as methods.
Is emergent and interpretive	A conceptual framework and interview guide are used as tools to elicit and interpret responses naturally from various subjects.
Views social phenomenon holistically	To ensure an holistic view of the research question, relevant data are found across various maturity model types as well as an organization that demonstrates how projects are managed in practice.
Researcher self-reflects, is aware of ethical issues and values	Researcher has thoroughly reviewed ethical issues and addressed each. Separately, field notes will play an integral role in data capture from all aspects of the researcher's experience (including value-based impressions).
Use of largely inductive reasoning	An inductive drive supports the multimethod design of the inquiry.

3.3.2 Ontological and epistemological considerations

The first decision necessary for those adopting a qualitative approach is to consider the ontological issues. The realities within this inquiry can be seen through two perspectives: namely, that of the organizations managing such projects, along with those who have already examined and defined 'maturity' from their own unique industry, organization or knowledge domain (each of which manifest in specific maturity

model design). The interpretation of both provides valuable perspectives to understand and contextualize the findings obtained here.

The widespread availability and use of maturity models suggest (by virtue of being assessment tools used against stated criteria) that reliable project management capabilities can be both measured and correlated against specific organizational processes (such as financial management). Reconciled with the Turner and Cochrane (1993) typology, however, even the most precise of these instruments cannot exactly measure the undefined nature of Type-3 project goals, or the likely variable methods used to determine them.

Moreover, with every new approach to maturity model design and use, the notion of a single reality is unreasonable and unrealistic. Individual models may try to promote a single definition of 'project management maturity' but with every individual organizational assessment comes a unique interpretation. To assume a similarly objective reality for this inquiry would be inappropriate and detrimental to the capture or reflection of specific experiences of organizations using a unique project management function for an undefined project.

In emphasizing the importance of understanding the processes through which humans capture their relationship to the world, a subjectivist view of reality is favoured (Morgan & Smircich 1980). Such an epistemological position, challenges the idea of objective knowledge (that can be specified and transmitted in a tangible form). The created knowledge is no more than an expression of the personal frame of reference through which the subject views the world.

These elements can identify and allow for interpretation of aspects of a reliable project management function. These interpretations may or may not correspond with current project management maturity models and, in so doing, offer a unique point for data collection. Human actors will offer these interpretations, and be supported by other data sources, such as maturity models outside of project management (initially) and project-specific literature (subsequently). This approach clearly falls within an interpretivist paradigm.

3.3.3 Axiological considerations

Axiology is another key consideration within a paradigm discussion. The absence of clear definable characteristics within project Types -2, -3, and -4 (of the Turner typology) force the researcher to look elsewhere for meaning and value. A reasonable strategy would be to look to one or more stakeholders

who assign meaning and/or value to the relevant dimension as a way of, perhaps, prioritizing a suitable solution.

Axiologically, the research is value-bound, although consideration must be given to the values associated with each maturity model (as identified by its designers and users). These values are associated with the lexicon specific to each model that were chosen to reflect the anticipated realities of the organizations (or specialized entities) using it. However, to analyze data within these narrow parameters would limit (or even exclude) the values of the human actors working within project management capabilities that do not correspond with the maturity models in question.

To fully understand the project management capability and its context, it is necessary to reconcile the two sets of values associated with models and those of the human actors, along with those of the researcher. By harmonizing the values of these two latter groups (actors and researcher) with the value framework of existing project management maturity models, insights are possible that offer an explanation or identify the variables affecting or contributing to the maturation of a project management capability responsible for undefined projects.

3.4 Using a multimethod research design

Thomas & Mullaly (2008) present a new form of methodological strategies in the project management community: one that robustly uses multiple methods to address research questions. The purpose of this next section is to demonstrate the application of such a ‘multimethod’ design in the study of project management maturity.

This research relies heavily on the research designs espoused by Datta (1997), Mingers (2001), Morse (2003), and Esteves and Pastor (2004). The first two offer the philosophical underpinnings justifying a pluralist approach to method design (Datta 1997; Mingers 2001), while Morse and Esteves offer more detailed perspectives on how such a design can be implemented (Esteves & Pastor 2004; Morse 2003). All advocate the use of multimethod design, with Datta (1997), in particular, commenting on the value of multimethod evaluations using case studies, which is of special relevance here.

The initial step of the research design begins with an analysis of existing maturity models (from various domains, both from within and outside of project management), where insight is possible concerning the expectations, definitions and understanding of 'maturity' in those fields. While valuable to the specific organization or industry in question, such definitions provide fresh a perspective concerning the realities of others as they try to understand how their capabilities may or may not be mature. It is these other organizations—such as those managing a Type-3 project—that can offer a different conceptual perspective on 'maturity' based on the practices they measure. These different worlds can generate different information, and different methods can be used to acquire it (Mingers 2001).

Designing a research study with multiple stages that proceeds through a number of steps to reflect multiple interpretations is a logical approach. Morse advocates this approach on the basis of three key design principles for multimethod inquiries (2003, pp. 196-9):

- Identify the theoretical drive of the research project;
- Develop overt awareness of the dominance of each project; and,
- Respect methodological integrity.

3.4.1 Identifying the theoretical drive of the research problem

The use of the term 'drive' is an essential characterization of Morse's (2003, p. 190) focus on research orientation. By using 'drive' to describe the theoretical dimension of the research activity, she is allowing for the inclusion of a 'minor component' (e.g. a deductive element to an inductive program and the reverse scenario). To be 'dominant' or offer a 'priority decision' (Morgan 1998, p. 362) suggests the need for a more flexible orientation of the Morse approach.

For this research, adopting a theoretical drive is appropriate for the nuanced connotations it suggests. While Morse (2003) seems to constrain the scope of 'drive' to inclusivity, the inductive or deductive influence on these phases is more textured that that. Reviewing the details and particular elements of (literally dozens of) maturity models is a drive characterized as much by a sense of discovery as destination. The journey through this literature is not quite a stroll down a wandering path, but nor does it have a straight trajectory.

This research follows an inductive drive initiated by the literature review and followed by Project #1—a textual analysis of various industry, organizational, and project management maturity models. Selections will be chosen partly based on their representation of the project types associated with Types-2,-3 and -4 in Turner and Cochrane's typology (see Figure 2-5).

The drive shifts metaphorical gears once the conceptual framework is created, and the case study is launched as Project #2, where the data collection will gather specific information related to each site's project management capability. Through this, the model will be testing its own veracity as well as supporting the interpretation of a reliable project management capability in a Type-3 setting.

Once complete, the inductive drive will have travelled through two projects using two qualitative data collection methods. Figure 3-2 illustrates the design.

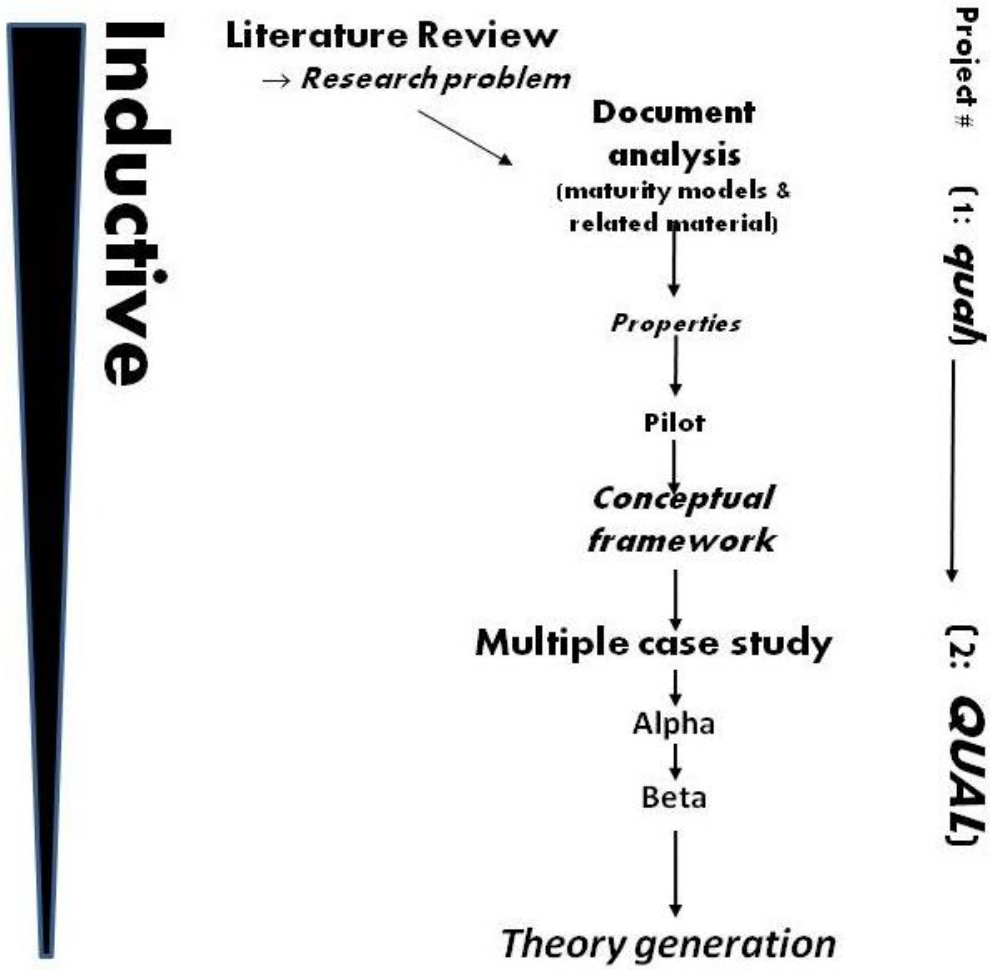

Figure 3-2: Research cycle (Pasian, for this research)

3.4.2 Develop overt awareness of the dominance of each research project

This research involves two qualitative projects (both of which follow the overall inductive drive of the inquiry), but it is the second project / component that has overall dominance. Morse (2003, p. 197) identifies four combinations of multimethod designs to support an inductive drive (see Table 3-2).

Table 3-2: Multimethod sequences (Adapted from Morse, 2003)

QUAL + qual	…for two qualitative methods used simultaneously, one of which is dominant or forms the base of the project as a whole.
QUAL→ qual	…for two qualitative methods used sequentially, one of which is dominant.
QUAL + quan	…for a qualitative and a quantitative method used simultaneously with an inductive theoretical thrust.
QUAL→quan	…for a qualitative and quantitative method used sequentially with an inductive theoretical drive.

Data collection and analysis within this research requires a variation on the sequential 'QUAL→qual' method identified above. To reflect this, the following variation has been designed (Table 3-3):

Table 3-3: New multimethod sequence (Pasian, for this research)

qual → QUAL	Indicating a sequential program where a qualitative project is followed by a second (more dominant) qualitative project.

The initial project will follow inductive logic and (use grounded theory techniques) in the analysis of maturity models. Ultimately, this will produce a conceptual framework for application in designated field sites. While instrumental to the research, it is not (nor could it be) the dominant project.

The content of the preliminary qualitative analysis will be a distillation of elements from the selected maturity models. This will enable the creation of a conceptual framework for use in the project management environment (selected in the case study). The model itself will not generate sufficient data to adequately answer the primary research question. For this reason, Project #1 is the subsidiary investigation within this research design.

The dominance of the second project is intensified by its direct relationship to and support of the interpretivist paradigm guiding this research. At the core of this inquiry, an answer to the research question cannot be found in the conceptual framework being used, or the maturity models that provide the basis for its development. Only by entering the world of a unique and undefined project environment

(with an e-Learning project representing a Type-3 project) can true insight be found – through engagement with and analysis of the occupants of that world. The respondents can explain their views (or 'multiple realities') and also interpret them through the lens of a conceptual framework focused on project management. In either case, the reality upon which theory is generated must occur on the constructed reality or interpretations of site participants.

3.4.3 Respect methodological integrity

Maintaining the integrity of each chosen method is the last of Morse's trio of multimethod design principles. To this end, methods are used in each phase to independently collect data, but are sequenced in a way that secures the dominance of the relevant project (Morse 2003, p. 201). As identified above, in this research the dominant project is the case study (Project #2) launched after the completion of the document analysis (Project #1). Table 3-4 summarizes the intended methods for each project.

Table 3-4: Research methods used in multimethod design (Pasian, for this research)

Project	Drive	Dominance	Research method used				
			Lit review	Document analysis	Grounded theory techniques	Pilot study	Case study (Interviews, Archived records, Direct observation, Field notes)
1	Inductive	qual	√	√	√		
2		QUAL			√	√	√

In managing a multimethod design, data are not combined but rather concluded (at the end of each project) to answer a particular question (Morse 2003). In this research, the following questions will be the focus of each Project:

1. Project #1 focuses on the data found in the selected maturity model collections and asks: What processes (including sub-processes, practices and other properties) are used to measure maturity in a capability responsible for undefined projects or initiatives?

2. Project #2 introduces these data (now in the form of a conceptual framework) to case sites. The goal in this project is to interpret the data provided against the conceptual framework. The question being answered in this project is: What factors (processes, practices, properties) outside of a defined project management capability can be attributed to its reliability?

3.5 Implementing a multimethod research design

On the basis of Figure 3-2, the multimethod design follows an inductive path and includes two primary projects. The elements of which are described in detail below.

3.5.1 Project #1: Document analysis

Given the central role of maturity models in this research, an in-depth analysis of these documents and records is necessary to fully explore the range of maturity model designs, lexicon and strategies. The initial search (in the Literature Review) examined the compatibility of representative types with existing definitions of project management maturity. A second, more extensive review of models (associated with the same project types):

- Illustrates how these project types measure maturity.
- Provides specific examples of the practices, processes and levels used to define and measure maturity in that specific project environment.

Document analysis is a key method of qualitative analysis, and one used in the production of reliable evidence about a large sample (Silverman 2005). While often embedded in one method or another (e.g. case study, interviewing), it is an approach that can provide data without the direct or indirect involvement of participants. The type of document can range dramatically, along with the purpose and advantages associated with its use. The purpose of the next section is to explore these parameters within the context of this research.

3.5.1.1 Definitions of documents, records and their analysis

Document analysis is the process by which documentation is examined with the aim of selecting facts from the material in question (Caulley 1983). The documents can be categorized at a macro level as public or private, primary or secondary, and can come in myriad forms.

Definitions include those offered by Caulley (1983, p. 19) who defines ‘documents’ as: written source of historical information; oral testimony; artifacts, pictorial survivals, archeological remains; and official / state papers such as treaties, laws, grants, and deeds.

Bryman (2004, pp. 380-97) identifies several categories of documents, two of which will be used for this research: official documents derived from private sources, and official documents derived from the state. Within this project, these types will almost entirely relate to the description of maturity models, including examples of use or commentary on same. Based on the findings of the literature review, it is expected that private sector companies, government agencies and higher education institutions (universities) are the main sources for such documents.

Lincoln and Guba (1985, p. 277) distinguish between two related terms—document and record—that are relevant for this inquiry. ‘Document’ is used to denote any written or recorded material (other than a record) that was not prepared specifically in response to a request from the inquirer (such as a set of interview notes). Examples of ‘documents’ include letters, diaries, speeches and case studies. ‘Records’ are any written or recorded statement prepared by or for an individual for the purpose of attesting to an event or providing an accounting. Examples include airline schedules, tax forms, government directories, birth certificates and audit reports.

The comparative value of the definitions hinges on this distinctive treatment of ‘records.’ Examining the maturity model literature (in and outside of project management) from this perspective, one can see the distinction between documents and records. The former encompasses the models themselves, while the latter (records) are separate insofar as they were prepared for an individual person, organization or other entity as a result of processes being evaluated (i.e. audited) for their maturity.

Using the definitions of document and record as the basis for collecting, sorting and analyzing material for Project #1, a more specific typology is further offered below.

3.5.1.1.1 A ‘document’ and ‘record’ typology

The typology of documents and records contributing to the analysis within Project #1 is summarized below (see Table 3-5).

Table 3-5: Document and record typology (Pasian, for this research)

	Type	Examples
Documents	Industry / Specialized Maturity Models from across various industries, organizations and knowledge domains. (A full listing is available in Appendix #1.)	Maturity grids, Hybrids and Likert-type questionnaires, CMM-style models (Fraser, Moultrie & Gregory 2002, p. 246)
	Descriptive collateral that describe model functioning, use or application. (This material differs from 'records.')	Instructions, illustrations, templates or other material describing the model or its use. (Marshall 2006)
Records	Maturity audit (where a maturity assessment was prepared as a result of using a specific maturity model).	Report to model user (Marshall 2005)

3.5.1.1.2 Advantages of document and record analysis

Several advantages exist concerning the use of documents and records (see Table 3-6).

Table 3-6: Advantages of document analysis (Pasian, for this research)

Advantage of document analysis…	Relevance to this research…
The advantage to collect some kinds of data that could not be obtained through interviewing (Caulley 1983, p. 20).	Terms, figures and other data contained within maturity models are pre-determined and explicit codifications of maturity and related levels, processes and practices.
Allows for inaccessible subjects (Bailey 1987, p. 291).	Assessing process maturity in multiple distant or highly specialized environments may be not be through direct contact. Documents and records associated with the maturity assessments are more advantageous by virtue of their accessibility.
Documents are convenient and low-cost (Bailey 1987, p. 292; Caulley 1983, p. 20).	Maturity models are largely available as public documents, widely distributed at no or minimal cost. Interviews of model designers is prohibitive and unnecessary to examine their design and content.
The non-reactive nature of data sources (Bailey 1987, p. 291).	Data contained within maturity models (and related documentation) do not lend themselves to 'reactions.'

3.5.1.1.3 A project management maturity model typology

A 'project management maturity model' is a specific type of maturity model that has its own classification schemes within the project management literature. The next section identifies the categories offered by project management researchers.

Cooke-Davies (2002, p. 3) offers a macro level typology of project management maturity models: relating to: the maturity of project management processes; technical delivery processes; and the total organization. Cleland & Ireland (2002, p. 290) identify two basic types specific to project management:

- Continuous project management maturity model: One that establishes a baseline for an organization through an assessment; specific elements are then used as criteria to establish what will be improved and at what rate.
- Staged project management maturity model: A five-step model that establishes criteria for each step. This permits incremental improvements in all areas of the project management capability under consideration.

3.5.1.2 Assessment of document quality

Stipulating how the quality of each document is assessed is an important consideration. A combination of criteria offered by Scott (1990, p. 6) and Bryman (2004, p. 392) will serve this purpose and contribute to the internal validity of the data.

1. Authenticity: Is the evidence genuine and of unquestionable origin?
2. Credibility: Is the evidence free from error and distortion?
3. Representativeness: Is the evidence typical of its kind and, if not, is the extent of its uncommon characteristics?
4. Meaning: Is the evidence clear and comprehensible?

3.5.2 A pilot case

A preparatory step toward the exploratory case study is the pilot case: a study that can help refine the concepts to be explored, intended content to be collected in the exploratory case study and the procedures to be followed (Yin 1989). The selection criteria identified by Yin—convenience, access and geographic proximity (1989, p. 74)—are relevant for this inquiry. The site is in the same city as the Alpha and Beta sites, are accessible (through relationships with faculty and staff) and are proximate to the other universities.

The pilot case will contribute to the conceptual development by building on the properties emergent from the maturity model analysis and relevant literature from e-Learning research. It will be, as Yin advocates (1989, p. 75), 'broad and less focused' than the ultimate collection instrument (the conceptual framework) to be used in the case study sites. Specific issues for exploration include project team roles, description of project management processes, and customer involvement.

A case report will be generated and analyzed, with findings reconciled with the conceptual framework.

3.5.3 Project #2: Exploratory case study

Definitions of 'case study' come from numerous sources, most of which offer characterizations that illuminate and/or emphasize different elements of the method. For the purpose of this inquiry, three interpretations have been adopted.

Yin (1984; 1989; 2003) is prominent in this area and is accepted as a dominant authority. His approach to case study design is clear and will be relied upon within this research. He offers three constituent elements to describe a case study as an empirical inquiry (1989, p. 23):

- Investigates a contemporary phenomenon within its real-life context when
- The boundaries between phenomenon and context are not clearly evident, and where
- Multiple sources of evidence are used.

Moving to Burns (1994, p. 313), the argument is made that case studies are well-suited for exploratory research 'because they are so intensive and generate rich subjective data, they may bring to light

variables, phenomenon, processes and relationships that deserve more intensive investigation.' Emphasizing the role that case studies play in shining light on 'processes' is especially resonant for this research. Eisenhardt (1989, p. 534) defines a case study as 'a research strategy that focuses on understanding the dynamics present within single settings.'

The purpose behind this etymological exercise is to illustrate a point: a method can be carefully selected yet confinedly applied. A selection of any single option above could possibly reduce the investigative and analytical parameters of the researcher. A combination of definitions can offer a more nuanced profile of a research instrument that will offer direction and facilitate investigation into a specific setting governed by its unique dynamics and dimensions. It is only with flexible, even responsive research instruments—including the definitions that guide our other design choices—that the following path can be navigated.

3.5.4 Designing an exploratory case study

The nature of the study question revolves around the nature of a project management function as it manages an undefined project type – specifically an e-Learning project. For this inquiry, this suggests the use of Yin's third category of case study design (1989) for an exploratory case study where the three primary conditions are: the type of research question posed; the extent of control an investigator has over actual behavioral events; and, the degree of focus on contemporary as opposed to historical events. The type of research question is exploratory and identified in Section 3.2.1.

The researcher in this investigation has no control over the subjects or the data collected. The events are contemporary, with a balance being struck between immediate project management activities and archived files that document similar projects and their management. Direct observation of stakeholder participation in certain project management activities will occur (to document the nature of these processes) as will systematic interviewing of key project personnel. These factors are all consistent with an exploratory case design.

The focus on a contemporary situation is determined through a narrowing of the type of industry, organization and project type that could be considered for case study. To accomplish this, the following questions are asked:

- What types of organizations manage an undefined project (categorized as Type-2, -3, or -4 by Turner and Cochrane)?

- What sector(s) are these organizations situated in?
- What is an example of an undefined project managed by such an organization?
- Is there evidence of either a project management capability or project management techniques used to manage the project type?

Based in part on the prior research of this researcher, a guide to the selection of a case study site is offered in Table 3-7:

Table 3-7: Delimitation table for case study selection (Pasian, for this research)

Delimiting question	Indicator	*Detail and/or example*
What types of organizations manage Type-3 projects?	Multiple	Colleges & universities
What sectors apply?	Public sector	Higher education
What project type is managed here?	Type-3	e-Learning
Evidence of project management capability or techniques?	Yes	Published theory in multiple journals[7]

3.5.4.1 Categorizing e-Learning projects as (Turner) Type-3

Broadly defined, e-Learning is the use of Internet technologies to create and deliver a rich learning environment that includes a broad array of instruction and information resources and solutions, the goal of which is to enhance individual and organizational performance (Colvin Clark & Mayer 2003; Rosenberg 2006).

The objective of e-Learning projects is to use technology-enabled resources to support the teaching and learning strategy of the host institution through the delivery of innovative instructional content. The challenge, however, lies in the interpretation of this broad goal at more operational levels where instructional designers and SMEs must identify project goals for their individual programs, courses, subjects, or units. 'E-Learning must be contextualized for individuals and enable the presentation and consideration of multiple perspectives' (Rossett 2002, p. 10).

[7] Relevant journals include (but are not limited to): *Journal of Distance Education*, *Australian Journal of Educational Technology*, *Educational Technology*, *The Internet and Higher Education*, and *Studies in Higher Education.*

Bullen and Janes (2007, p. viii) describe three course categories that are consistent with the e-Learning projects managed at the sites being explored in this research:

- e-Learning as distance education, referring to courses that are delivered entirely, or almost entirely, on the Internet.
- e-Learning as electronically mediated learning, including any teaching or learning that is mediated by technology (e.g. learning objects that simulate concepts used as part of regular on-campus teaching). It is not necessarily distance education.
- e-Learning as facilitated transactions software, including software that is used to organize and manage teaching (such as learning management systems).

For the purposes of this research, e-Learning projects are being used as examples of Type-3 projects within the Turner & Cochrane typology. As such, their methods are considered highly defined, while their goals are not. Maintaining flexibility or open-endedness is a critical component in facilitating the teaching and learning experiences of end-users (both students and SMEs) where each will bring to their use of the course their own inclinations, behaviours, and preferences. Such a 'notoriously difficult' (Turner & Cochrane 1993, p. 94) dimension demands flexibility within the project as its being designed and, most critically, implemented. These projects must leave room for spontaneous, unplanned use that is supportive of stated learning objectives but expansive in potential use.

3.5.4.2 Site selection and unit of analysis

Two sites were chosen: each site a university (situated in Canada) that uses a demonstrable project management function (or techniques) in the design, development and implementation of e-Learning projects (see Table 3-8). Selection was limited to two in order to compare sites that share some common ground but leave open the possibility for unique elements to emerge against the conceptual framework.

In keeping with the parameters of the team profile, the unit of analysis for this inquiry is the individual project team (comprised of several team member roles). Data will be collected from the first site, analyzed and then cross-compared with the second site.

Table 3-8: Site selection table (Pasian, for this research)

Descriptor	Alpha site	Beta site
Population served	>500k	>500k
Location	Metropolitan area	Metropolitan area
Programs offered	Undergraduate, Graduate, Continuing Studies	Undergraduate, Graduate, Professional, Continuing Studies
Technological orientation	Moderate	Extremely strong
History with distance education (DE)	Moderate	Extensive
DE offerings	Moderate	Extensive
History with e-Learning	>10 years	>10 years
e-Learning offerings	Extensive	Extensive
Designated project management support for e-Learning projects?	Yes	Yes

3.5.5 Theoretical sampling in multimethod design

Bryman (1988, p. 90) argues that, when choosing a theoretical sample, "the issue should be couched in terms of the generalizability of cases to theoretical propositions rather than to populations or universes." Silverman (2005, p. 131) supports this position by identifying one of the features of theoretical sampling as 'choosing cases in terms of theory.' Mason (1996, pp. 93-4) further supports this position by explaining that 'theoretical sampling means selecting groups or categories to study on the basis of their relevance to you research questions…and the explanation or account which you are developing.'

Examining case study selection within a multimethod setting has received little attention. To this end, this approach will partially rely on the work of Datta (1997, p. 346) who argues that better evaluations for results [will occur] if the following conditions are met.

- Selection of methods is parsimonious and appropriate to the [research] questions….[The] key issue being the decision of what case study type and sequencing meets the needs.
    - To select the case study types, (identified earlier as 'Alpha' and 'Beta'), post-secondary institutions within the Canadian higher education community were reviewed. A consolidation of several categories and subcategories took place (see Table 3-8).

- Due care is used in anticipating threats to the integrity of the multimethod design, data collection, analysis and reporting.
    - To address real or anticipated threats, a case study protocol was prepared (see Appendix #1).
- Expectations are realistic concerning the value-added of case studies (and every other method in the overall design).
    - Having and achieving realistic expectations is a dimension of the research process itself – one akin to solving a puzzle. And, like any puzzle, seeing the entire picture within a multimethod research design comes one piece at a time (Morse 2003, p. 189). Data associated with the case study, while highly influential, are of limited value. As Mingers (2001, p. 243) emphasizes: 'Different methods generate information about different aspects of the world…It is desirable and feasible to combine together different methods to gain richer and more reliable research results.'

3.5.5.1 Data collection principles and procedures

To maximize the benefits associated with this case study design—most notably the building of theory—three principles of data collection will be followed: multiple sources of evidence; creating a digital storage device[8], and maintaining a chain of evidence (Eisenhardt 1989, p. 537; Yin 1989, pp. 95-102). Each data collection method is explained below along with the case study protocol that will serve as an overview for participants.

3.5.5.2 Case study protocol

A key element toward increasing the reliability of a multiple-case design is the use of a case study protocol to be shared amongst data collection subjects (see Appendix #1). The outline is below:

- Section A: Overview
    - Introduction
    - Research Overview & Fact sheet

[8] Strictly speaking, Yin refers to a 'database' (1989, p.98) but given the developments in information technology in the subsequent 20 years, other options are available for researchers.

- Rationale behind site selection (general)
- Researcher's role

- Section B: Description of procedures
  - Semi-structured interviews
  - Direct observation
  - Archived material review
  - Field notes
  - Physical artifacts
- Section C: Interview guide (Conceptual Framework from Project #1)

3.5.5.3 Semi-structured interviews

Semi-structured interviews are a key source of evidence within a case study allows the reporting of events to be the result of interpretation by directly involved subjects (Yin 1989). By using interviews, the researcher can reach areas of reality that would otherwise remain inaccessible—such as people's subjective experiences and attitudes.

To address the themes of this inquiry, a careful and thoughtful unearthing of the circumstances surrounding the management of e-Learning projects is necessary. Because this inquiry touches on themes of procedural reliability, manageability and predictability, it is critical to understand not just whether a process existed but why and how it was received and used. Asking a project manager—or, more likely in this case, an instructional designer—to confirm the use of certain processes related to the management of projects will obtain a perfunctory response. Asking why, on the other hand, will allow the interview subject to interpret and reveal the circumstances and conditions of its use.

3.5.5.3.1 Interview subjects

Determination of appropriate interview subjects are the result of the purposeful selection of subject-matter experts and staff within the university setting who are responsible for various project management processes associated with e-Learning projects. Individuals are selected because of their roles in managing these projects.

Although job descriptions and titles might differ slightly between institutions, key project management roles will be chosen for interviews based on demonstrated relevance to e-Learning projects. They are: course developer, instructional designer, project sponsor, SME (i.e. specialized faculty), and unit / department head (see Table 3-9).

Table 3-9: Standard team profile for e-Learning projects (Pasian, for this research)

Role	Description
Course developer	A practitioner / expert in multimedia design, incorporating content through various digital media in a coherent and, generally, interactive fashion.
Instructional Designer / Project manager	An expert in the science (study) of instruction.
Sponsor	The senior academic or administrative officer responsible for approval of project, including academic release, financials and content.
Subject-matter expert	An academic with recognized expertise in one or more areas. Responsible for content development in an e-Learning project.
Unit / Department Head	A manager specifically responsible for information technology services and application development, responsible for either a specific unit or centralized function.

3.5.5.4 Direct observation

The researcher is an onlooker or observer in this inquiry, primarily collecting data through the methods identified in this section. Different site visits will lend themselves to different types of observation: informal site visits will allow the researcher to conduct interviews and generally observe the offices of the project management unit or office. More formal observation will occur should the site have a testing period where the Type-3 project is being developed and evaluated. The researcher will observe these activities and conduct interviews with obliging participants.

3.5.5.5 Field notes

Descriptive data are essential to the effectiveness of case study work by providing details of situations that interpretative language can conceal (Patton 1990). Field notes offer researchers an essential vehicle to capture descriptive observations about those being observed at the site, what they have said or done (either directly to the researcher or independently), and the feelings, reactions and reflections of the researcher.

Within the scope of this inquiry, data concerning the definition and use of processes lie at its core. Obtaining these data is limited, however, by the constraints of instruments such as interviews, physical

artifacts and archived materials. Field notes help overcome these limitations by allowing the researcher to make observations on anything that they believe is worth noting (Patton 1990).

3.5.5.6 Physical artifacts

Each unit of analysis (the individual team member) in this research contributes to the management of a specific e-Learning project. An examination of the processes surrounding the design, development and delivery (or management) of those projects must involve the technological media itself. As Yin illustrates (1989, p. 95), understanding the use of a computer may not occur through direct examination of the device but ascertained through a component – namely, a computer printout. In this case, understanding the management processes of an e-Learning project may require the examination of .HTML pages, CDs, DVD, or any other physical artifact.

3.5.5.7 Archived records

Archival evidence will be relevant to this research insofar as it can illustrate the management of e-Learning projects under similar conditions, and using similar project management processes, techniques and resources. The purpose of this evidence is to illuminate the conditions under which project management was adopted and used more than once to reliably manage these projects.

3.6 Data analysis

Data analysis will occur in two parts—Document Analysis (Project #1) and Case Study (Project #2) both using grounded theory techniques. The three basic elements of theory building through grounded theory are concepts, categories and propositions. Concepts are the basic units of analysis since it is from conceptualization of data, not the actual data *per se*, that theory is developed. Corbin and Strauss (1990, p. 7) explain:

> Theories can't be built with actual incidents or activities as observed or reported; that is from 'raw data.' The incidents, events, happenings are taken as, or analyzed as, potential indicators of phenomenon, which are thereby given conceptual labels.

As defined by Corbin and Strauss (1990, p. 7), categories are higher in level and more abstract that the concepts they represent. They are generated through the same analytical process of making comparisons

to highlight similarities and differences that is used to produce lower level concepts. Categories are the 'cornerstones' of developing theory, they provide the means by which the theory can be integrated.'

The final element of grounded theory are propositions which indicate generalized relationships between a category and its concepts and between discrete categories. As Whetten (1989, p. 492) explains, propositions involve conceptual relationships whereas hypotheses require measured relationships.

3.6.1 Specific techniques associated with individual projects

Specific data collection and analysis techniques are used for each qualitative project method used in this research. They are described below.

3.6.1.1 Project #1: Document analysis

NVivo (version 8.0) software was used to analyze and code the content of project management maturity models and others from various industries and organizations. As Richards (1999, p. 55) explains, categorizing is a way to 'think up' from the data to greater generality. Two nodal types are used to categorize data: free nodes (in the document analysis of Project #1) and tree nodes (for the case study of Project #2). The former is advantageous in analyzing the maturity models to facilitate its unorganized text and facilitate emergent ideas while the latter allows for hierarchical order around growing concepts (1999, p. 57). The generated properties will be listed (in descending order) based on frequency of sources and references, with categories generated from the non-PM models.

Further literature will be reviewed that is associated with the process model of instructional design, variables (partly identified by the maturity model analysis) and customer involvement in e-Learning projects, and intangible factors that affect project team member involvement.

The final step is the development of a conceptual framework based partially on these data. Analysis of pilot study data will also contribute.

3.6.1.2 Project #2: Case studies

Analyzing data collected from the case sites will involve a combination of several steps, beginning with interviews using the conceptual framework. The resulting data will be coded multiple times (again, using the NVivo application) and a provisional list of codes generated based on emergent relationships identified from the coding.

Building case-ordered meta matrices using the codes generated from the open-coding will allow the detailed data to be allocated (based on team roles) across the sites (see Table 5-1 for an illustration of a partial meta-matrix). Macro-level themes from these matrices will identify variations to the conceptual framework. A revised conceptual framework that reflects each site's variations will be included at the end of their analysis.

A comparison between the sites will be the final step of the analysis, with a revised conceptual framework presented that includes variations from both sites.

3.6.2 Anticipated ethical issues

Traditional notions of validation rely on objectivity which, in a qualitative setting, has a significantly different meaning encompassing honesty, ethics and high moral standards (Cicmil 2006). This next section address the aforementioned and related issues that may affect the integrity of data and/or derail the efforts to collect and analyze it.

3.6.2.1 Informed consent

A basic pillar of social sciences research is the principle of informed consent. Those being interviewed or observed are in full knowledge of the purpose and procedures of the research, the consequences (notably, any risks) of them taking part, the credentials of the researcher, and the plans for data storage and use (Bailey 1987; Piper & Simons 2005; Silverman 2005). Written consent has become the norm for securing permission, and has been the standard followed in this research (see Appendix #1).

3.6.2.2 Confidentiality and anonymity

Another basic principle in social science practice is maintaining confidentiality in the research process and the anonymity of the individuals providing data (Piper & Simons 2005). In the discussion of project management practices and individual projects, it is widely (and reasonably) expected that failures will be identified and discussed. The encouragement of candour—leading to full(er) disclosure of these details—is only possible in a research environment that protects the identity of both the sites and staff working there.

This researcher anticipated the possible release of confidential and potentially unflattering information and instituted a basic coding scheme. Sites are identified as 'Alpha' and 'Beta,' and participants are identified by role.

3.6.2.3 Potential harm to researcher

Bailey (1987, p. 422) identifies the potential harm to the researcher and potential benefits of the research as neglected aspects of research ethics. With respect to the researcher, prior involvement with members of the targeted community and specific relationships with some members of the Alpha and Beta sites creates a high degree of familiarity.

While helpful in securing the site visits and interviews, the possibility exists for familiarity to lead to informality and misinterpretation. Addressing this potential harm requires a strict adherence to the formal steps in acquiring site access and adhering to the data collection instruments (e.g. the interview guide).

3.6.2.4 Being non-judgmental

Avoiding judgmental behaviour (or its appearance) is the final ethical risk potentially affecting this research. The researcher must be cognizant of her role and be vigilant in safeguarding the integrity of both the respondents and the knowledge they provide. Assuming imperfect knowledge by the respondent is, in fact, advantageous. Researchers must maintain a non-judgmental disposition (even in the face of ignorance) to avoid introducing unwanted values to the phenomenon being researched (Silverman 2005).

3.7 Research quality

This inquiry takes the view that 'qualitative studies take place in a real social world…and can have real consequences on people's lives' (Miles & Huberman 1994, p. 277). By shining a light on the project management capability of organizations responsible for implementing educational projects, the data and/or the conclusions can influence other organizations with similar challenges. Providing the data with integrity requires consistency with the interpretivist principles introduced earlier. The standard of trustworthiness guided this research, based on the principles of confirmability, dependability, credibility and transferability (Lincoln & Guba 1985).

3.7.1 Confirmability

This criterion requires the researcher to be remain self-aware that personal biases might influence the research and its credibility (Smyth 2006). 'Relative neutrality' is the goal using data replicability as the means to achieve it (Miles & Huberman 1994, p. 278). The confirmability of the data can be found through three primary techniques:

1) The extensive presentation and analysis of captured data, mapped against specific interview subjects at each case site;
2) The linking of conclusions against the key issues raised in the conceptual framework and the condensed / displayed data; and,
3) The retention of all interview transcripts, site documentation, field notes and other related material (which could serve as or support an 'audit trail,' should one be followed). All data will be held in the secure computer of the researcher and in a secured location by the researcher's supervisor, Professor Spike Boydell, at the University of Technology, Sydney (spike.boydell@uts.edu.au).

3.7.2 Dependability

Dependability is closely associated with confirmability—the key issue being the consistency and stability of the data collection processes (Smyth 2006). From the initial site contact through to the data coding, dependability of the data is a result of:

1) Both sites receive the identical case protocol, which detailed the purpose and scope of the inquiry, identified the interview subjects being sought and provided a profile of the researcher.
2) Every interview follows the same sequence: interview identification, respondent identification, research overview, and introduction of the conceptual framework as the primary interview tool.
3) The substance of each interview follows a similar pattern. Open-ended questions are used with each respondent, with each of the four framework nodes serving as prompts.
4) Once collected, all data are mapped against the primary and secondary topics contained within the conceptual framework.

3.7.3 Credibility

According to Miles and Huberman (1994, p. 278), 'truth value' lies at the heart of credibility. Do the findings of the study make sense? Are they credible to the people being studied and the readers? Are they authentic? Achieving this authenticity is the result of:

1. Rendering a comprehensive account of a project management practice where the perspective of all team members is obtained, planning documents are reviewed and examples of project types are examined.
2. A 'rich' (Maxwell 2008, p. 244) description of the management processes and practices that plausibly accounts for the typical management of an e-Learning project.
3. Where uncertainty exists (e.g. a team member's perspective is not provided), alternative data sources are presented through views from colleagues.
4. Presented data corresponds with the conceptual framework provided, and further analysis provides new, corroborating concepts.

3.7.4 Transferability

Can the findings of this inquiry be conveyed to another setting? Several factors support this possibility:

1. Descriptions of the teaching and development units presented herein, including the team make-up and typical e-Learning projects are ubiquitous through higher education. Almost any post-secondary institution could see itself in this profile and consider the results relevant.
2. The results offer 'rich' descriptions of the issues such that another educational institution could see its reflection in the accountings provided.
3. The data collected and analyzed are well supported by existing literature (specifically in the higher education community responsible for e-Learning projects).

3.8 Conclusion

The purpose of this research is to examine how an organization managing projects with limited definability can do so reliably. As a result of this examination, it might be possible to refine the definition

of project management maturity and suggest reconfigurations of project management maturity models. The purpose of this chapter is, from a research design perspective, to describe how this is achieved via an exploratory route.

The next chapter will focus on the document analysis of the maturity models (identified as Project #1). Its focus is to identify the processes and practices used in models (outside of project management) to measure the maturity of capabilities associated with undefined projects. This analysis will generate a conceptual framework for use in the exploratory case study (Project #2).

Chapter 4
Project # 1: Document Analysis

4.1 Introduction

Document analysis is a superior method to gathering certain types of data when compared to, for example, interviewing (Caulley 1983, p. 20). By using this technique in an examination of maturity models, properties can emerge that shed a different perspective on how maturity is defined and achieved (depending on the model). The approach taken by the current generation of project management maturity models has been to (largely) reflect the knowledge areas from dominant project management methodologies and/or special technical processes (see Section 2.6.3.2).

Certain characteristics dominate—the emphasis on processes that are repeatable, definable and manageable, for example—and promote a view of maturity that emphasizes efficiency. While resonant with certain industries that value (indeed, require) process control in their highly defined projects, other projects with less definition might, conceivably, be better served by an alternative approach to modeling.

Alternative maturity models are available outside of the project management community and are represented in this chapter. Dozens of models have been sourced and examined for properties that their designers have chosen to define maturity and the path to get there. Emergent themes from these alternative models are identified, categorized into four major themes and incorporated in a conceptual framework for use in the case study (see Figure 4-1).

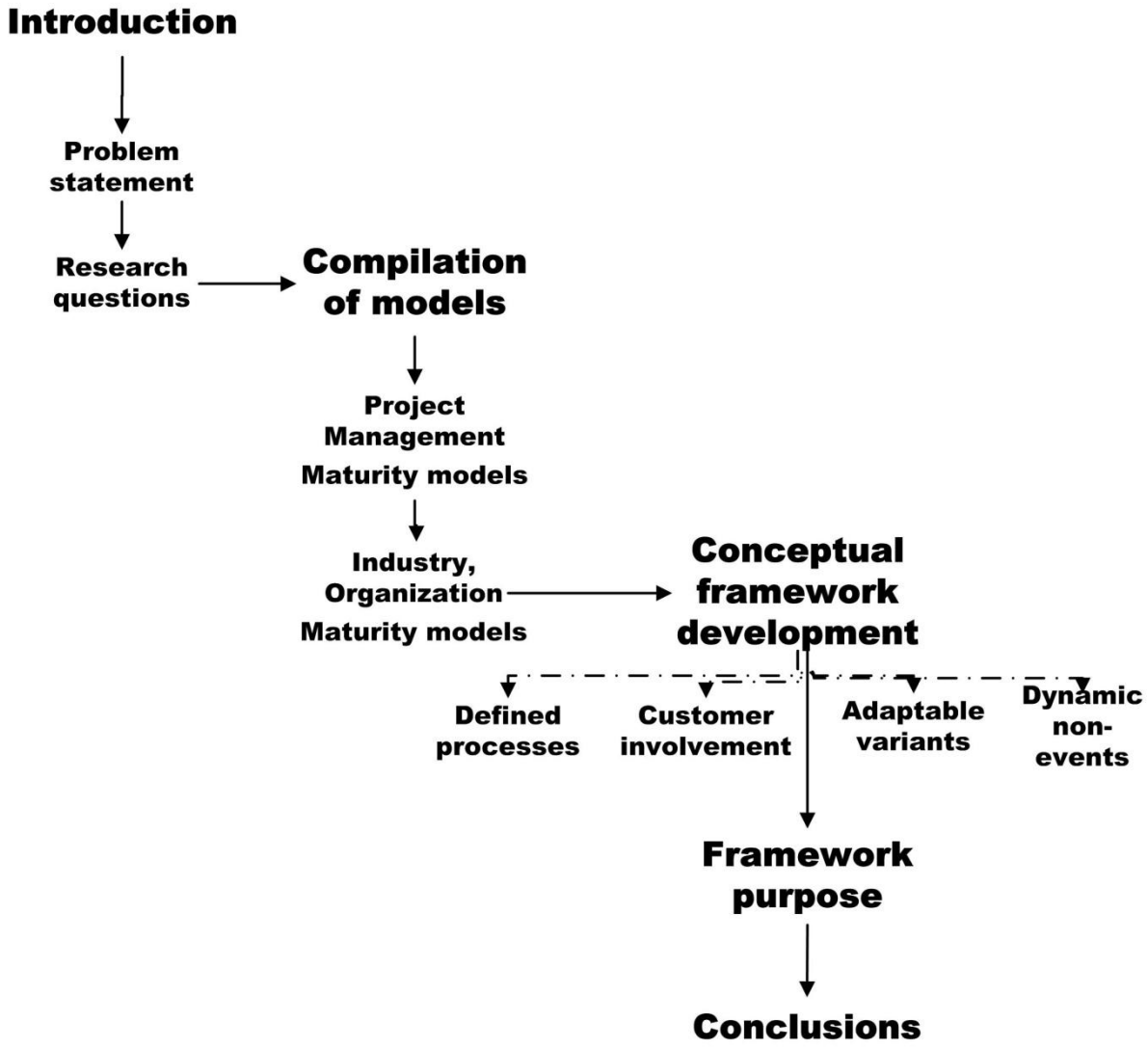

Figure 4-1: Pictorial outline of document analysis chapter (Pasian, for this research)

4.2 Chapter goal

The goal of this chapter is to create a conceptual framework for use in the collection and analysis of data from the designated case sites. Its creation will result from the following:

a. Compilation of two sets of maturity models: one associated with project management, and the second from a range of industries, organizations and knowledge domains;

b. Textual analysis of both model sets;

c. Identification of defined processes from a specialized body of knowledge (instructional design) associated with e-Learning projects;

d. Identification of dominant themes from the textual analysis;

e. Incorporation of findings from pilot site; and,

f. Review of literature pertaining to the concept of 'reliability.'

4.3 Compilation and textual analysis of models

4.3.1 Project management maturity models

The textual analysis of project management maturity models is based on those listed in Table 2-4. An abbreviated list is provided here:

- *Construction Project Management Maturity Model*
- *Project Management Process Maturity Model*
- *Evolutionary Software Project Management Maturity Model*
- *Strategic Project Management Maturity Model*
- *OPM3*
- *Prince 2 Maturity Model*
- *Portfolio, Programme and Project Management Maturity Model*
- *The Project Management Maturity Model*
- *ProMMM*

A different view of these models is offered through the analysis of the text within their stages or levels. Grounded theory techniques, using NVivo, were used in this analysis (see Section 3.6.1.1), identifying the frequency of terms (# of references) in source documents. 'Management,' as an example, was referenced as a theme 42 times in 23 sources. (By comparison, 'culture' was the most frequent term referenced in the other maturity models – 62 times in 17 sources. See Table 4-1). Emphasis remains on specific project

management processes (generally associated with commonly used knowledge areas) and those associated with technical delivery.

The knowledge areas of both *PMBoK* and *OPM3* are prominent as process areas. They include: integration management, scope management, time management, cost management, quality management, human resource management, communications management, risk management, and procurement management. They serve as the foundation upon which multiple sub-processes are based—which are included in Table 4-1.

This analysis reinforces the fact that the current generation of project management maturity models are dominated by process-oriented factors. Customer-oriented processes do not surface. Specific factors from this analysis are not included in the framework but, conceptually, they are represented through the inclusion of the defined processes associated with the management of an e-Learning project.

Table 4-1: Resulting nodes: open coding analysis of PM maturity models (Pasian, for this research)

Item	*Sources*	*# of References*
Management	**23**	**42**
Organization	**17**	**28**
Process management	**15**	**23**
Process, Tool development	**13**	**22**
Awareness	**11**	**20**
Business Case & Benefits	**14**	**19**
Project specifications	**6**	**17**
Formality	**8**	**15**
PM Office	**5**	**15**
Risks and Management	**5**	**14**
Training	**13**	**14**
Communications	**6**	**11**
Quality management	**7**	**11**
Data management	**9**	**10**
Continuous improvement	**7**	**9**
PM process analysis	**7**	**9**
Importance of individual	**6**	**8**
Project Phases	**2**	**8**
Project Stages	**1**	**8**
Resources	**6**	**8**
Teamwork	**6**	**8**

Benchmarking	**3**	**7**
Culture	**4**	**6**
Project definition	**2**	**6**
Financial	**3**	**5**
Knowledge transfer	**4**	**5**
Stakeholders	**2**	**5**
Activity definition, scheduling	**3**	**4**
PM planning, documentation	**2**	**4**
Scheduling	**3**	**4**
Success	**4**	**4**
Adaptation of model	**2**	**3**
Budgeting, Costs, Financial	**2**	**3**
Change control	**2**	**3**
Evaluation criteria	**3**	**3**
Governance	**2**	**3**
Project Scheduling, Activities	**2**	**3**
Absence of processes, factors	**1**	**2**
Points of Disagreement	**2**	**2**
Procurement	**1**	**2**
Project Governance	**1**	**2**
Project WBS	**1**	**2**
Skills, Knowledge Acquisition	**2**	**2**
Competency	**1**	**1**
Vision	**1**	**1**

4.3.2 Maturity models from outside project management

The design and deployment of maturity models has rapidly spread across industries and organizations. Depending on its application, a model can be referring to the technical meaning of 'maturity' as it is used in capability maturity models, or to one more commonly found in biological sciences where 'maturity' refers to ripening or aging.

A collection of representative models has been purposefully selected and is included in its entirety in Appendix #2. The associated industries, organizations and domains are represented and identified in Table 4-2:

Table 4-2: Industry and organization representation in model analysis (Pasian, for this research)

Action Research	Agricultural Sciences
Business Development	Building Security / Infrastructure
Business—IT Alignment	Change Management
Cloud Computing	Community Management
Computing Education	Contracting, Procurement
Criminal organizations	Data Warehousing
Earned Value Management	e-Government
e-Health	e-Learning/Online course design
Email communications	Engineering education
Enterprise Architecture	IBM Data Governance
Internet	Information Processes
Knowledge Management	Leadership
Marketing	Network Engineering
New product development	Offshore Industries (Design & Safety)
Open Source programming	Procurement management
Requirements Engineering	Security Testing, Management
Service-oriented Architecture	Software Maintenance, Testing
Systems Usability	Teen Pregnancy

4.3.2.1 Emergent properties from other maturity models

An analysis of the stage/level text in maturity models from outside project management reveals different areas of emphasis in the qualities they assess for maturity determinations (see Table 4-3). While technical processes remain present, much greater consideration—relative to project management maturity models—is given to factors that do not obviously or easily lend themselves to process definition or management. Of particular interest are ‘culture’ and ‘customer,’ the two items referred to most often in these maturity models.

For the purposes of this inquiry, such evidence supports two observations: different paths toward maturity are in use outside of the project management community, and these paths consider 'maturity' as something more than the successful control of process variations. Such differences could emerge from what Kwak and Anbari (2009) call 'allied disciplines:' operations research, organizational behavior, information technology/systems, innovation, engineering, strategy, performance management and quality management. The properties gleaned from the maturity model analysis (from outside the project management community) reinforce their conclusions. Particular resonance is indicated in three 'disciplines:' organizational behavior, innovation and operations.

These suppositions contribute to the design of a conceptual framework that purports a project management capability involving non-process factors. The results of the coding of the maturity models from outside project management (Table 4-3) indicate strong reliance on multiple factors relevant to the organization being explored in this inquiry's case study: culture, customer, organizational policies, leadership, organizational interface and resources. These are included in the conceptual framework.

Table 4-3: Resulting nodes: open coding analysis of non-PM models (Pasian, for this research)

Item	Sources	# of references
Culture	17	62
Customer	11	61
Organizational & management policies	19	52
Leaders, champions (individual roles)	19	38
Interface with host organization	19	36
Specific processes	16	34
Quality	18	32
Resources	14	30
Business Case & Benefits	9	26
Problems, Variations, Defects	9	25
Training	9	25
Organizational , Environment	17	24
Continuous Improvement	13	22
Project characteristics	13	21
Chaotic references	7	20
Risk Management	7	20
Change management	10	19
Project Planning	13	19
Informal	8	18
Quantitative assessment	13	17
Strategic management	10	17

Success	**9**	**17**
Teamwork & Collaboration	**10**	**17**
Standardization	**10**	**16**
Results-oriented factor	**6**	**12**
Organizational Learning	**6**	**9**
Importance of individual	**6**	**8**
Repeatability	**6**	**8**
Communications	**4**	**7**
Risks	**3**	**7**
Vision	**3**	**6**
Awareness	**2**	**5**
Stakeholders	**1**	**3**
Adaptability	**2**	**2**
Excellence	**2**	**2**
Infrastructure	**2**	**2**
Marketing	**1**	**2**
Procurement	**1**	**2**
Testing	**1**	**2**
Budget issues	**1**	**1**
Competency	**1**	**1**
Expertise	**1**	**1**
Governance	**1**	**1**
PM Office	**1**	**1**
Reflecting dynamic qualities	**1**	**1**
Technology	**1**	**1**

4.4 Development of a conceptual framework

The final section of this chapter is devoted to the creation of a conceptual framework for use in the collection and analysis of data at the designated case sites. Four major themes will serve as its basis – defined processes, customer involvement, adaptable variants, and dynamic non-events. They are described below in Sections 4.4.1 – 4.4.5.

No emphasis is given at this stage to any one individual theme or any perceived relationship amongst them. The order in which they are presented—or explored in the interview setting—is of no significance at this point, although these issues will be re-examined in the data analysis. Several sources are drawn upon to design the framework:

a) the textual analysis of the models (see Sections 4.3.1 and 4.3.2);

b) specialized body of knowledge (instructional design) associated with e-Learning and the typical model processes used in this environment – namely the ADDIE model (see Section 4.4.1 below);

c) previous work published by this researcher that is germane to the project environment being explored (Pasian & Woodill 2006a; Pasian 2006; Pasian & Woodill 2006b);

d) data associated with the inquiry's pilot case (see Appendix #3); and,

e) current literature related to the topic of 'reliability' and intangible factors that describe team member involvement (associated with managing a project).

4.4.1 Defined processes

Current theory concerning project management maturity models requires the presence of defined processes to indicate a mature project management capability (see Section 2.6.3). The presence and use of defined processes also exist across other maturity models outside of project management (as explored in the maturity models listed in Section 4.3.2). A specialized project environment such as one responsible for e-Learning projects also relies on the consistent use of a specialized body of knowledge that uses certain defined processes for their management (Moore & Kearsley 1996).

Consequently, 'defined processes' will be a component of the conceptual framework with the generic instructional design model—ADDIE—providing the specific management processes associated with an e-Learning project. They are defined as follows (Moore & Kearsley 1996, p. 103):

- (A) Analysis of the teaching and learning needs, including a preliminary assessment (overview) of the material;
- (D) Design: the goals and objectives of the instructional program articulated in specific terms, as well as the structure and format of the course;
- (D) Development: instructional materials (such as films, study guides, books, multimedia) are created produced, and tested;
- (I) Implementation: students register, instructional materials are delivered and SMEs / tutors interact with students; and,

- (E) Evaluation: these activities involve testing and grading of students and the assessment of instructional effectiveness of the course and materials.

4.4.2 A profile of a reliable e-Learning project management capability

Based on the findings of earlier published research, an e-Learning project management capability (in a university setting) can be considered reliable when its outputs consistently:

1. Satisfy project outcomes as defined by the project team (Williams 2006a).
2. Generate data that illustrate support of institutional plans (Jones 2004; Pitts & Siedlaczek 2006).
3. Produce pedagogically-sound, media-rich online courses that do not overlap existing ones (Chiazzese & Seta 2006; Malinski & MacRae 2006).
4. Move the institution forward by providing knowledge, processes and skills that have been integrated into normal institutional practice (Wallace 2006; Williams 2006b).
5. Obtain satisfactory responses from students in end-of-course surveys (Wallace 2006; Williams 2006b).
6. Facilitate the acquisition of learning, skills development or attitudinal change as a result of the online course (Mykota 2006).
7. Sustain or increases course enrolment (Williams 2006b).
8. Fully involve key internal departments and individuals (Machado 2007).
9. Demonstrate a sustainability of management elements and an adaptability to new initiatives (Jones 2004).
10. Illustrate a high level of ‘e-readiness’ (Pasian & Woodill 2006b)—defined as ‘the ability of HEIs and the capacity of the institutional stakeholders to benefit from educational technology (or e-Learning).’

4.4.3 Customer involvement

The definition of 'customer' varies considerably within project management, and its presence in project management maturity models is minimal. Its presence in non-project management models, however, is much greater and underscores the importance placed by these models on factors involving that customer that may or may not be a defined process. The *Business Development Maturity Model* is one such example (BDII, 2007).

Moreover, it is especially relevant for this case study to include 'customer' as a unique theme in the conceptual framework given their involvement in e-Learning projects (Bell & Bell 2005; Morrison & Rowan 2006a; Oblinger 2003; Tan, Aris & Abu 2006) . The definition of an 'e-Learning customer' used in this inquiry is (Jones 2004, p. 51):

> Customers for the teaching products' of a university can be seen as including students, the general community, government, business and professional bodies. … The term 'customer' is used to mean someone who receives benefit from the product.

The conceptual relevance of this node was confirmed as a result of the data collected at the pilot site. As the report indicates (see Appendix #3) multiple points of customer involvement exist in management of e-Learning projects, and multiple factors affect that involvement: attitude, motivation and trust among them (Sections H-K). These observations justify the relevance of this node and its value as a point of discussion in the Alpha and Beta data collection.

4.4.4 Adaptable variants

Certain emergent properties from the second maturity model collection indicated a reliance on qualities of an abstract or variable nature in the assessment of maturity (see Table 4.3). These properties suggest that some organizations, industries or knowledge domains place some emphasis on properties that may not relate to repeatability, definability, and manageability.

This conceptual framework contains variants represented in at least two of the sources identified above and ranked highly in the open coding analysis of both maturity model collections. They include culture, interface with the organization, leadership, teamwork, expertise, and academic freedom. They can be adaptable to many projects with post-secondary educational institutions but vary in their nature.

Leadership, for example, is a common property but may be adapted differently between organizations and vary in its interpretation and use. Bourne and Walker (2003, p. 229) explore the importance of this variable as one in a balanced set of interpersonal skills that will allow project managers to 'tap into the power lines;' more effectively work in and influence the culture and politics of a project environment and the stakeholders that affect it. University environments (such as those within this inquiry) are excellent examples of organizations where instructional designers (as project managers) are regularly challenged to demonstrate their leadership within cultural and political tensions.

Greater specificity to the leadership roles of a project manager are offered by Flannes and Levin (2005): leader, manager, facilitator and mentor. Of these, instructional designers (as the project manager in an e-Learning project), work with subject-matter experts to 'conceptualize, articulate and motivate the team toward realizing a vision' (2005, p. 26). 'Administrative' management (2005, p. 28) is also a shared responsibility—typically with a more senior manager in the teaching and learning unit.

Problem resolution is another factor that affects and is managed by organizations differently and often by individual project. Appreciating the effect uncertain requirements can have on projects and the interpersonal conflict generated within teams as members attempt to address and resolve such tasks is the focus of current research by Yu-Chih Liu et al. (2010). A 'proactive approach for ensuring project success' is to prevent interpersonal conflicts between users and information systems professionals (2010, p. 8).

A key dimension to e-Learning projects is the digital development of teaching and learning content – an exercise made more difficult with its undefined goals. Interaction between course developers, instructional designers and users (students) is critical and subject to inter-personal conflict—an issue facilitated by instructional designers as part of their leadership role (Flannes & Levin 2005, p. 32). This research supports the 'Adaptable Variable' node and the inclusion of 'problem resolution' in particular.

4.4.5 Dynamic non-events

This concept refers to a stable outcome – but one that achieved through constant change rather than continuous repetition. 'Safety,' the example provided by Weick and Sutcliffe (Weick & Sutcliffe 2001, p. 30), is a result of a change in one system parameter compensating for a change in another. Achieving

stability in an e-Learning project environment is similar in that managing the project requires practices and enablers that do not always lend themselves to a formal process.

Building trust amongst recalcitrant SMEs or motivating junior team members all contribute to the management of e-Learning projects. The contributions are not necessarily measurable, but can be identified. In so doing, they partially fulfill one of the key markers of project management maturity—definability.

Properties listed in this component of the conceptual framework are not necessarily prominent in either collection of maturity models. Their inclusion is based on broader perceptions of the factors affecting organizational behaviour. They include trust, attitude, loyalty, acceptance/willingness, motivation and commitment. Recent publications in the project management literature underscore the relevance of these factors.

'Trust,' 'commitment,' and 'loyalty,' for example, are explored in research undertaken by Walker and Johannes (2003, p. 44) in the Hong Kong construction industry. They identify the importance of these factors in business relationships, particularly joint ventures. Commitment—the mental and physical manifestation of trust—indicates the willingness of parties to 'live up to' the spirit of the bargain (or task) by committing more personal pride and obligation 'to do the right thing' than would otherwise be the case. Loyalty occurs when trust and commitment are tested.

While the Walker and Johannes industry focus is a departure from the higher education community backdrop in this inquiry, the identification of these factors does speak to their universal importance in a project team setting. On this basis, they reinforce the relevance and importance of this node and its specific sub-elements.

The 'human side of quality in projects' is the focus of recent research (Geraldi, Kutsch & Turner 2010; Kwak & Anbari 2009). Kwak and Anbari (2009, p. 101), in their assessment of 'allied disciplines' that contribute to or affect project management practice and research, emphasize that 'project management should never forget the human aspects such as trust, teamwork and pride.'

Geraldi et al. (2010) interviewed subjects who identified several attributes they considered representative of or important to project quality. Many are consistent with the emergent properties from the maturity

models (outside of project management) and reinforce the importance of the 'dynamic non-event' node and several items listed therein.

Respondents identified: commitment by team members (as ownership of project quality), integration (with stakeholders and other organizational units), adaptability (to project change), and meeting commitments (to technical specifications, deadlines and other project objectives).

Motivation amongst project workers is the focus of research from Dwivedula and Bredillet (2010). After grounding their study against the backdrop of traditional work organizations, they identify professional development, work climate, perceived equity, and job security amongst the factors that directly affect worker motivation. Such variables are characterized by Flannes and Levin (2005, pp. 73-6) as situational considerations and speak to various levels of employee/team member needs.

Mentors, as described by Flannes and Levin (2005, p. 34), may need to serve as role models, demonstrate personal interest, offer constructive feedback, resources and direction in both the project and their ongoing professional development – in short, be an advocate for individuals within both the project and its organizational context. Such advocacy is a function of 'leadership' and, strictly speaking, is included as such in the Adaptable Variants node. The effect of that leadership, however, as influencing individual motivation, trust, commitment and other 'non-events' is also relevant here.

4.5 The framework's purpose

Based on the data provided above, a conceptual framework (Figure 4-2) is offered that represents different contributing factors to a reliable e-Learning project management capability as identified in sections 4.4.1—4.4.5. This instrument supports this researcher (and by extension, the goals of this inquiry) in several ways. First, it narrows the scope of the data collection to focus on a specific aspect of the e-Learning—namely, the management of these projects—and identifies the processes associated with them. This eliminates (or significantly narrows) examinations of other aspects of this phenomenon such as pedagogy (the science of instructional design), andragogy (the science of adult learning), or highly specialized technology (such as cloud computing). Significant research in these domains is ongoing and outside the scope of this work.

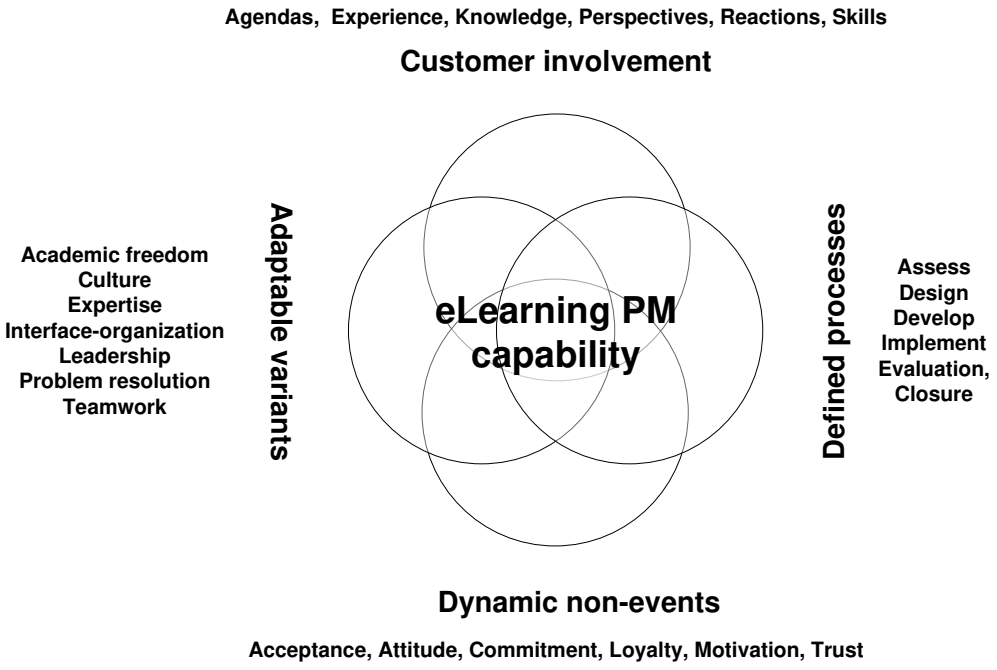

Figure 4-2: Conceptual framework (Pasian, for this research)

Several themes are incorporated in the design of this framework, and their interrelationships offer a third opportunity for data analysis. The framework illustrates equal relationships between each of the four major nodes. While this may or may not be the outcome supported by the data analysis, presenting each node equally offers the respondent a chance to comment on relationship(s) they perceive amongst the nodes without bias. The presentation of the nodes is not meant to be a hypothesis. Logic, personal experiences or any other lenses may be used by respondents—framed through a semi-structured interview—to see relationships within this proposition from their respective point of view.

The conceptual framework suggests the existence of a reliable e-Learning project management function. The reliability of e-Learning project management capabilities cannot be an assumption – and this researcher is cognizant that some may believe this conclusion has already been drawn. This is not the case, and a key section of Chapter 5 will be to define reliability within this sphere using existing research. With this as a foundation, the chapter can turn to the exploration of factors that can be attributed to the reliability of that capability.

4.6 Conclusion

This chapter has analyzed two collections of maturity models—those within the project management community and those external to it—to identify properties that may be unrelated to the process control principles of definability, repeatability and predictability. Among these are the customer, culture, leadership, teamwork—all elements that one could expect in a project management capability responsible for educational projects within a post-secondary institution.

These three dimensions—defined processes, adaptable variants and customer involvement—serve as three of the primary nodes within a conceptual framework to be used in the collection of data at two selected universities. The fourth node—dynamic non-events—reflects qualities that have been identified by organizational behavior researchers as essential to the stability of a systems environment.

Chapter 5 will test the validity of this framework.

Chapter 5
Project # 2: Data Collection & Analysis

5.1 Introduction

This chapter has four distinct components (Figure 5-1): an explanation of the steps of analysis, presentation and analysis of Alpha and Beta site data, and a site comparison. Each is a step along the path toward answering the question (associated with Project #2): what processes, practices, enablers and properties contribute to an organization reliably managing a project with limited definability?

The chapter begins with a detailed explanation of the steps of analysis (Section 5.2): designing the conceptual framework, visiting sites and collecting data, open and axial coding; and the creation of case-ordered meta-matrices. This explanation sets the stage for the data that follow by re-introducing the team roles that serve as the units of analysis (Table 5-2). Readers will also note table of references [P], [Pr], [E], [Pt], and [O] that are noted at the end of each bullet point within each case and its sub-categories (Table 5-3).

The case studies make up the Sections 5.3—5.8 (Alpha site) and 5.9—5.14 (Beta site) of this chapter. Descriptions of each site begin the section, including team roles and project types—this provides an organizational context to the data that follow. The subsequent analysis follows the same four nodes of the conceptual framework: customer involvement, defined processes, adaptable variants and dynamic non-events.

Sub-categories are contained within each of these nodes: they have been determined by the open coding initially applied to the data. The meta-matrix analysis (using the team roles as the units of analysis) has generated the individual bullet points that are assigned to each of these points.

Some or all of the [P], [Pr], [E], [Pt], and [O] notations are noted at the end of each of these bullet points. Not all sub-categories have a collection of bullet points referencing each of these five property references. (Analysis of interview data did not always generate points that could be assigned to unique sub-categories. When reviewing each sub-category, the same path is followed as these properties are

referenced with the following abbreviations: processes [P], practices [Pr], enablers [E], properties [Pt], and observations [O].

A site comparison is the fourth section of the chapter (5.15), creating a bridge to Chapter 6 where the research questions will be answered and discussed.

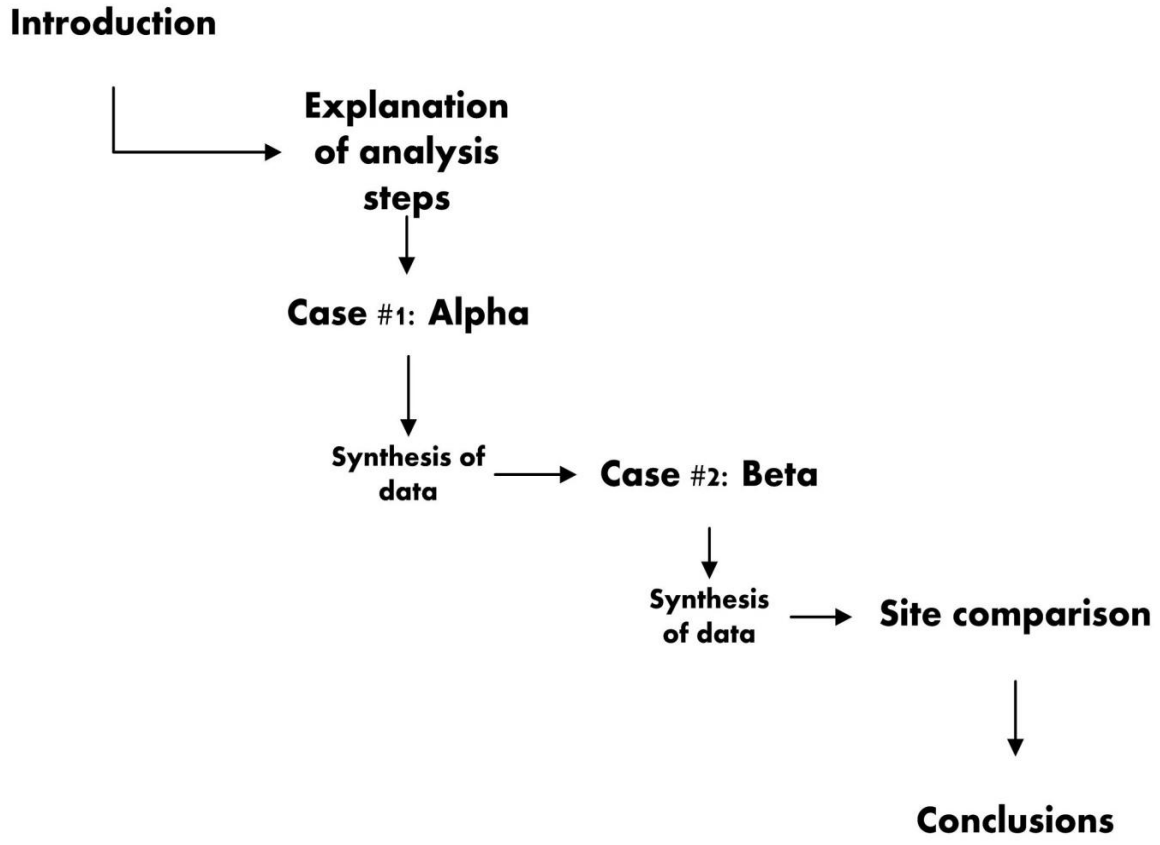

Figure 5-1: Pictorial outline of data collection & analysis chapter (Pasian, for this research)

5.2 An explanation of steps in the analysis

1. Evolving the conceptual framework was the first step (see Section 4.4). This incorporated variables and their relationships (gained from literature in project management, higher education and organizational behavior), and was used at each site to facilitate the capture of various data.

2. Data collection at the Alpha and Beta sites was the second step, resulting in the material presented in each of their sections.

3. Coding the interview transcripts and other source material was the third major step. Using the concepts identified within the conceptual framework (Figure 4-2) as the provisional start list of codes as advocated by Miles and Huberman (1994), open coding involved several line-by-line reviews to satisfactorily access and identify relationships within the material and create tree nodes.

Figure 5-2 provides an illustrative example of how the coding technique (described in Section 3.6.1.1). Multiple branches (emergent from the data analysis) contributed to the tree nodes representing the provisional (starting) list related to Defined Processes. The challenge then became reducing these concepts around higher order concepts.

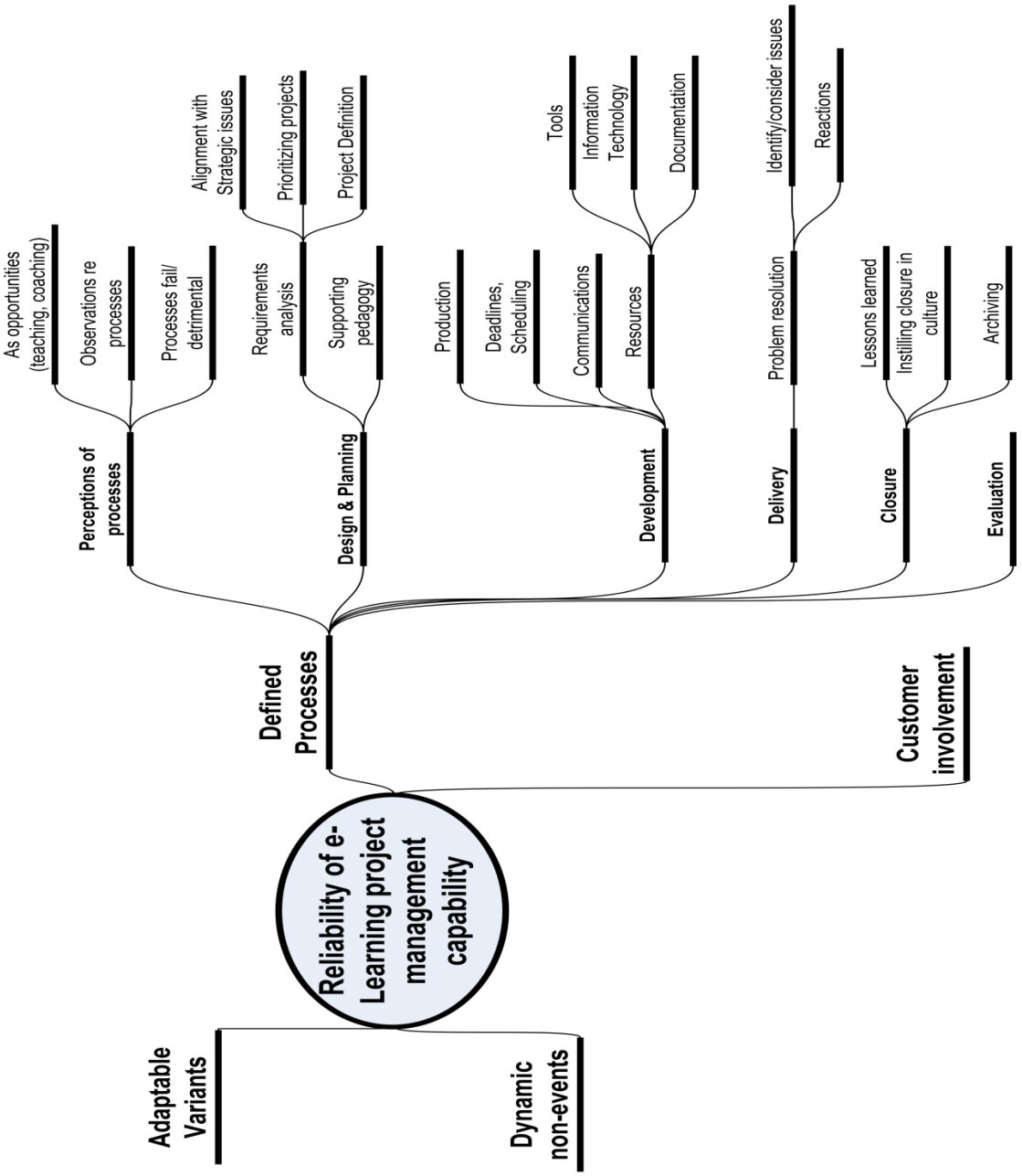

Figure 5-2: Example of open coding around Defined Processes node (Pasian, for this research)

This was further developed through the axial coding subsequently used to identify relationships amongst these open codes. This involved analyzing the data around key axis and grouping those elements around

categories with commonality to form concepts. By analyzing the data around the original nodes, variations presented themselves resulting in new concepts.

Variations on the original conceptual framework nodes that have emerged from the Alpha and Beta sites are presented in Table 5-23 (Section 5-15). Exploration of these variations will serve as the basis for a comparison between the sites.

4. Creating a 'Case-ordered Meta-matrix' (one for each site) was the next step in the analysis. As Miles and Huberman (1994, p. 178) explain, the first benefit of the instrument is that each matrix contains the relevant and coded site data in a condensed chart. Within Table 5-1, the concepts of a partial display of a meta-matrix (using data from the Alpha site) are illustrated. In this table, only 2 sub-nodes from within 'Dynamic non-events' are mapped against the Alpha team roles—hence the reference to a 'partial' meta-matrix.

Table 5-1: Illustrative partial case-level meta-matrix (Pasian, for this research)

		Sponsor	Manager	Instructional designer	Department Head	Subject-matter expert	Course developer
Dynamic non-events	Motivation		"Developing plan is easy...getting them to use it is hard." [O]	Team members (from a union) perceived with lesser skills affect motivations of others. [E]	Union regulations affect pay scales - affects motivation [E] There's motivation but not urgency. [O]	Motivation comes from team seeing project in development [P] Project success: more funding. [E]	The development team in different union: fewer opportunities [PT]
	Commitment	Evidence of lack of commitment can be found in union mentality, inactive participation [O]	Personal connection is needed by PMO, particularly when organizational units are dispersed. [E]	Comes from team (especially SMEs, designers) seeing project in development. [P] ID commitment to pc must be "inside and out." (Absence has project implications.) [E] Commitment stems from institutional values [P]	Unit management can commit resources after recognition of a problem [PR] Commitment to understanding the environment can be higher [O]	Work with designers reinforces SME commitment [E]	

A reader can see the concepts generated by the axial coding of the second step have been assigned to the 'Y' axis. Along the 'X' axis, the team members are listed. With this framework in place (for the total matrix), the processes, practices, enablers and properties gleaned from the coded data are placed within the appropriate cell. Readers can see [O], [E], [PT] references. These have been defined in Table 5-3 and will be seen throughout the data analysis of both Alpha and Beta sites.

The second benefit of the meta-matrix approach is its 'stackable' nature (Miles & Huberman 1994, p. 180). By partitioning data in new ways and/or clustering around new text, variables can emerge (depending on the interests and demands of the inquiry). By using a matrix constructed by these variables—such as the one for the Alpha site—subsequent sites can be 'stacked' upon it. In this inquiry, the process is limited to the Beta site but it is easily conceivable, however, that this same matrix can be used at future sites (i.e. other higher education institutions with different profiles).

Processes, practices, enablers, observations and properties are attributed to each team member.

5.2.1 Definitions

The matrices of the Alpha and Beta sites are segmented by role and included at the end of each case study. References to team roles will be made throughout the data analysis. For ease of reference, the table originally presented in Chapter 3 descriptions of the roles are repeated here (Table 5-2).

Table 5-2: Team role definitions (Pasian, for this research)

Role	Description
Course developer	A practitioner / expert in multimedia design, incorporating content through various digital media in a coherent and, generally, interactive fashion.
Instructional Designer / Project manager	An expert in the science (study) of instruction.
Sponsor	The senior academic or administrative officer responsible for approval of project, including academic release, financials and content.
Subject-matter expert	An academic with recognized expertise in one or more areas. Responsible for content development in an e-Learning project.
Unit / Department Head	A manager specifically responsible for information technology services and application development, responsible for either a specific unit or centralized function.

Annotations are made throughout the following analysis to processes, practices, enablers, observations and properties—readers will see each entry followed by one of the following symbols [P], [Pr], [E], [O] and [PT] . Definitions are provided in Table 5-3. Both the 'Meta-matrices' and 'Content-Analytic Summary' have been developed on the basis of these definitions.

Table 5-3: Definitions for process, practice, enabler, property & observation (Pasian, for this research)

Process [P]	A defined way to perform some activity, generally involving a sequence of methods or procedures designed to accomplish a specified result.
Practice [Pr]	A usual procedure or practice, typically a matter of habit or tacit agreement.
Enabler [E]	A characteristic pertaining to an individual process (not necessarily project management but within this environment).
Property [Pt]	An essential or distinctive attribute or quality of a thing.
Observation [O]	A remark or comment based on what has been noticed.

5.3 Case study: Alpha site

5.3.1 Description

'Alpha' is a post-secondary institution serving approximately 30,000 students (full and part-time) in a large metropolitan community. It has various certificate and degree programs, at both the undergraduate and graduate levels, as well as some professional and continuing educational studies. Research projects are also underway to a more limited degree.

Four modes of delivering teaching and learning are used: face-to-face, online, distance and 'mixed mode' (a combination of any of the three). A unit exists entirely devoted to supporting the associated teaching and learning mechanisms staffed by various professional occupations and organizational roles. For the purposes of this research, however, only those relevant to the management of e-Learning projects were chosen. See Table 5-4.

The institution is committed to the use of information technology to support its teaching and learning agenda. A partial quote from its policy (2010):

> The institute provides information processing facilities to its users to support the teaching and learning, research and administrative goals of the organization. These resources are valuable community assets to be used and managed responsibility to ensure their integrity, security and availability for educational and business services.[9]

5.3.2 Project type(s)

Respondents at both sites were asked to identify e-Learning projects managed within their unit. Alpha respondents identified the following in support of the institution's teaching and learning strategy:

i. online courses (fully online so they could be delivered at a distance or in an alternate to full-time day study);

[9] To protect anonymity, institutional names are withheld.

ii. hybrid courses (some components are online maybe self tests, discussions or a module) for delivery in a full-time day program or online; and,
iii. single technology projects (e.g. web game, simulation, multi media objects) to be embedded in a course.

5.3.3 Team roles

The team roles originally targeted for interviewing did not entirely correspond with those provided at the Alpha site. A new manager—responsible for the Project Management Office—also participated in the interview process. Table 5-4 summarizes what was expected and provided.

Table 5-4: Alpha site - team roles (Pasian, for this research)

Role	Expected	Provided
Course developer	Yes	Yes
Instructional designer / Project manager	Yes	Yes
Sponsor	Yes	Yes
Unit / Department Head*	Yes	Yes
Subject-matter expert	Yes	Yes
Manager, Project management Office	No	Yes

*The exact type of department head could not be identified prior to being on site.

5.4 Customer involvement

Data collection concerning customer involvement began with their identification. All respondents in the Alpha site identified 'customers,' but, in three cases, subjects indicated that the language of 'client' or 'customer' was, they felt, inappropriate for a higher education environment. One further distinction was made concerning a 'bad' customer: one who 'does not indicate what they want.'

5.4.1 Customer Identification

The brevity of this list indicates shared opinions amongst several of the respondents concerning one or more customer definitions. According to the respondents, customers are:

i. The 'school [institution] as a whole' and individuals within it (this could include the Dean and/or Associate Dean and/or Vice-President, Education),

ii. Individual subject-matter experts members,

iii. Programs for which subject-matter experts work, and,

iv. Students.

5.4.2 Skills, perspectives and experiences

Although four customer types were identified, observations concerning the skills, perspectives and experiences were only provided for departmental staff/subject-matter experts and students.

- Subject-matter experts
  i. 'Not considered technically savvy.' [Pr]
  ii. Additional instruction [for them] directly affects design. [Pr]
- Students
  i. Different learning needs offer a different perspective on how the project. [Pr]
  ii. 'Technical skills vary amongst students,' along with their perspectives. [Pr]
  iii. Despite these variations, however, training to compensate for the absence of skills was generally not required during the project. [Pr]
  iv. Students, unlike SMEs, come to the project with enthusiasm, an understanding of the student body, and lacking cynicism. 'They are not jaded because of their varying levels of experience.' [Pt]

5.4.3 Agendas

Alpha site respondents provided observations concerning the agendas of only the subject-matter experts.

i. SMEs are seen to have agendas—more important than that of the project. [Pt]

ii. By participating in these projects, they can expand their knowledge about these processes and design issues for application to future initiatives. [E]

5.4.4 Reactions

i. SMEs typically challenge the Unit when developing project proposals. [Pr]

ii. Trust helps through one-on-ones and process/procedure workshops. [E]

iii. The opportunity to see the multimedia design unfold causes student enthusiasm. [Pt]

5.5 Defined processes

Managing e-Learning projects requires instructional design expertise and methods. In choosing the elements of this node, ADDIE (see Section 4.4.1), a generic model used by instructional designers, was adopted. The appropriateness of ADDIE as an instructional design model was confirmed by respondents at the Alpha site, but the primary project management model only partially reflected ADDIE principles. Variations on the ADDIE model at the Alpha site are presented in Figures 5-3, 5-4, 5-5, and 5-6. Comments were provided on this topic, largely by instructional designers.

Respondents varied considerably in their use and familiarity with the Unit's project management model and supplementary material. (Its recent deployment was a contributing factor in this.) Requirement for its use varied, dependent on role.

5.5.1 Project initiation (documented processes)

Figure 5-3 documents the set of processes that Unit staff are directed to follow (depending on their role). This stage involves some of the steps normally associated with the 'Analysis' phase of the ADDIE model. On the basis of this map and interviews, Alpha emphasis is placed on the following processes:

i. Needs assessment. [P]
ii. Project definition. [P]
iii. Identification of Unit staff and their involvement. [P]
iv. Determining the suitable plan for the proposed project (which is separate from the preparation of a project plan). [P]
v. Preparation of appropriate documentation for management review and/or planning. [P]

vi. Approval (where appropriate) at various management levels. [P]

vii. Assignment of project manager for project planning. [P]

viii. Facilitates the identification of students. [P]

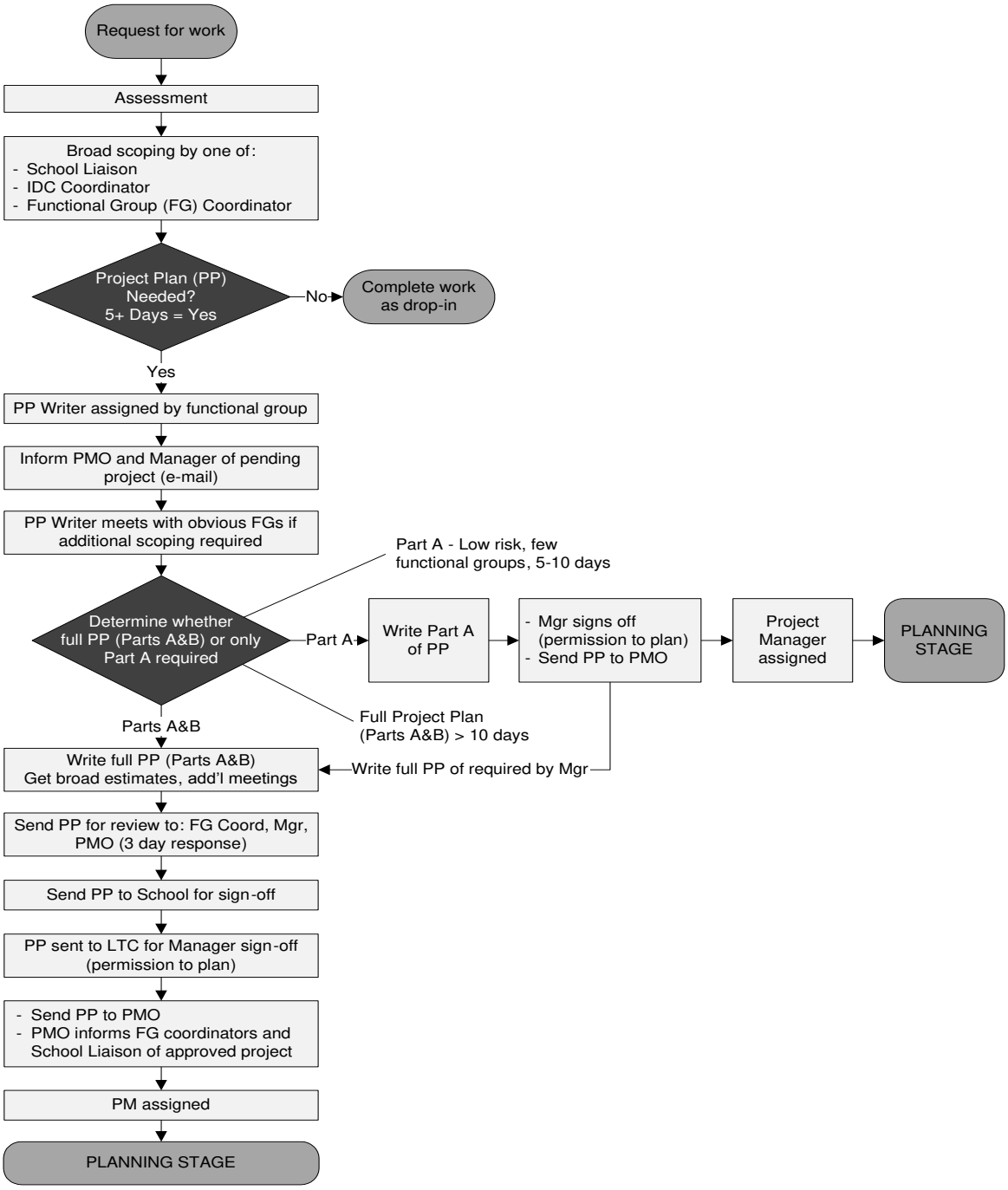

Figure 5-3: Alpha site: project initiation stage (Adapted from Alpha site source data, 2010)

5.5.1.1 Project initiation – other factors

Beyond the specific processes identified in Figure 5-3, respondents identified other factors associated with the Initiation phase. Some respondents identified elements not necessarily associated with this stage: these were practices or enablers concerning scheduling, communications and meetings that could be contained with any stage but were identified here. Enablers revolved around the decision-making of individual team members (generally the instructional designer / project manager) but often not to a positive end. Respondents often voiced frustration with a process-oriented approach, and cultivated an environment where other non-process factors helped manage e-Learning projects.

i. Project priorities determined by schools (not the Unit). [P]

ii. The PMO does not have direct supervision over project teams or their managers. [P]

iii. Designated mid-level management group focuses project management efforts. [P]

iv. The PMO supports (not manages) a dedicated coordination group, management team. [P]

v. The schedule of the subject-matter expert must be carefully managed. [Pr]

vi. Start up meeting required (but often does not happen). [Pr]

vii. Deliberate avoidance of basic project management tasks and meetings is a frequent occurrence because of their elemental nature. [Pr]

viii. The PMO communicates with various formal and informal tools. [Pr]

    a. The development of additional tools is not always done (despite necessity). [E]

ix. Individual discretion is a factor in emphasizing certain processes over others. [E]

x. Project delays: subject-matter experts, program and dean use undefined because of spontaneous methods (to accommodate T&L schedule). [E]

xi. Instructional designers can accept process maps but typically show significant discretion in their implementation. [E]

xii. ‘Effective project management: project manager has very active role.’ [O]

xiii. ‘Subject-matter experts, course developers voiced frustration when processes changed.’ [O]

xiv. ‘New tracking systems caused disruptions.’ [O]

xv. ‘Sign-offs, deliverables are used in the absence of trust.’ [O]

5.5.2 Project planning (documented processes)

Again, the Alpha site does not strictly follow the ADDIE model, although the Planning stage involves a combination of the ‘Analysis’ and ‘Design’ phases. Once the project has been ‘initiated,’ its management moves to the Planning stage (Figure 5-4) where processes focus on:

i. Review project plan. [P]

ii. Prepare project documentation. [P]

iii. Assemble project team. [P]

iv. Create WBS, communications plan; review plans to ensure within parameters. [P]

v. Confirm task assignments; develop additional tools as necessary. [P]

vi. Move to Execution stage. [P]

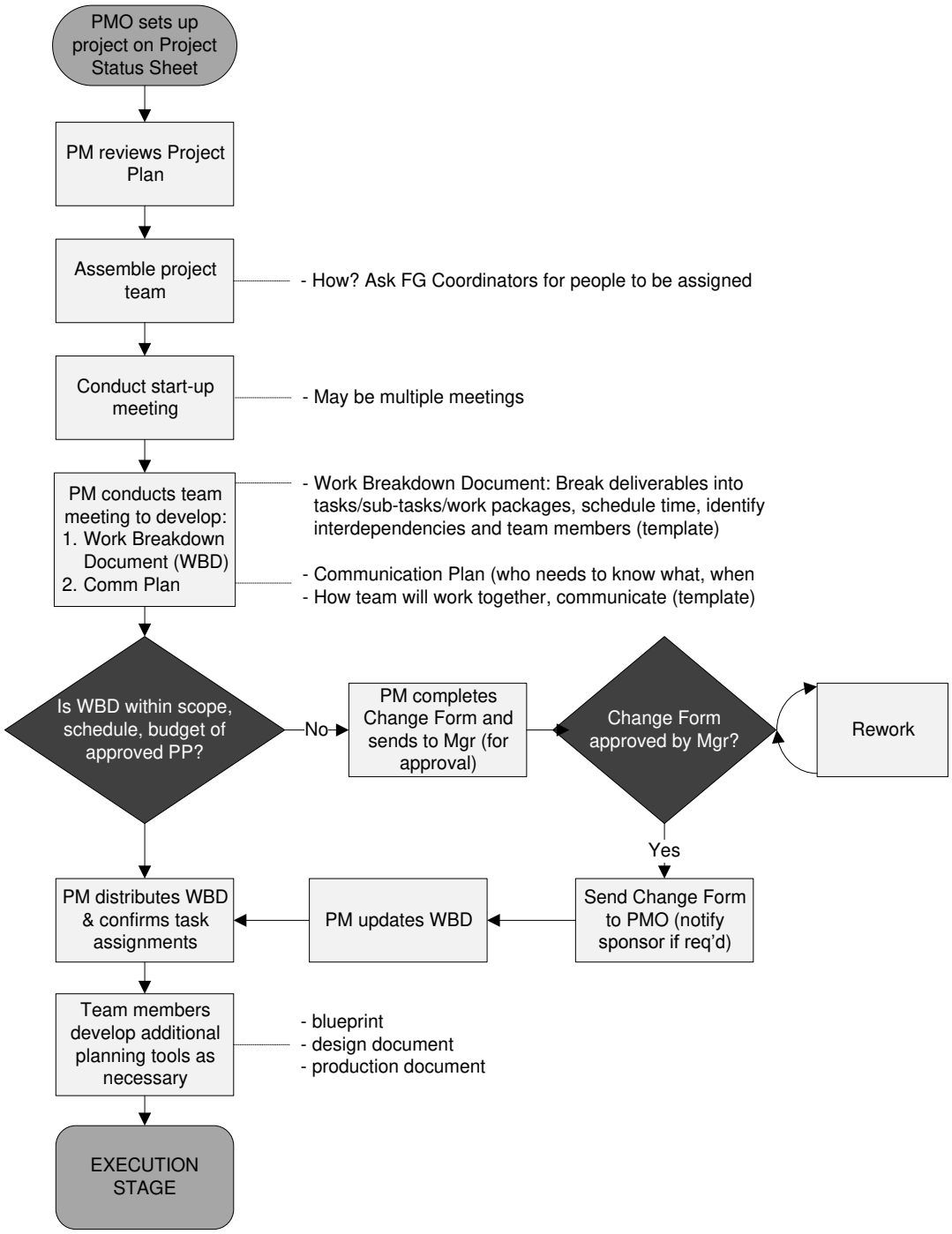

Figure 5-4: Alpha site: project planning stage (Adapted from Alpha site source data, 2010)

5.5.2.1 Project planning (other factors)

Unlike the Initiation phase, respondents provided little data concerning this phase. The contributions that were provided seem to oscillate between acceptance (even promotion) of the benefits associated with a process approach. On the other hand, some respondents commented on a perceived disconnect between the culture of a process-orientated shop and their own. For some, this indicated a willingness to reject them.

i. Process is there to help things go smoothly, communicate. [E]

ii. Evolution of new processes allows new projects to thrive whereas old processes may have been prohibitive. [E]

iii. 'Foster teamwork. Expect things outside processes.' [O]

iv. 'Defined processes are acceptable but can't be onerous—must be transparent.' [O]

v. 'PMBoK too rigorous for their culture—we can't have such an approach.' [O]

vi. 'New processes help work through chaos.' [O]

vii. 'Not all things lend themselves to process.' [O]

5.5.3 Project execution (documented processes)

The Execution stage involves many of the elements contained within the 'Design' and 'Development' phases of the ADDIE model. The documented processes (through the documentation of Figure 5-5 and interviews) associated with the execution of e-Learning projects are identified as:

i. Teams work according to project plan, the work breakdown schedule. [P]

ii. Project manager manages flow of multiple tasks, deliverables with multiple stakeholders. [P]

iii. SMEs management: through multiple processes for iterative content development, signoffs and/or provision of content. [P]

iv. Course developers evaluates technology through prototype—these sessions create feedback loop vital to project and it management. [P]

v. Acknowledge project completion. [P]

vi. Move to 'close' stage. [P]

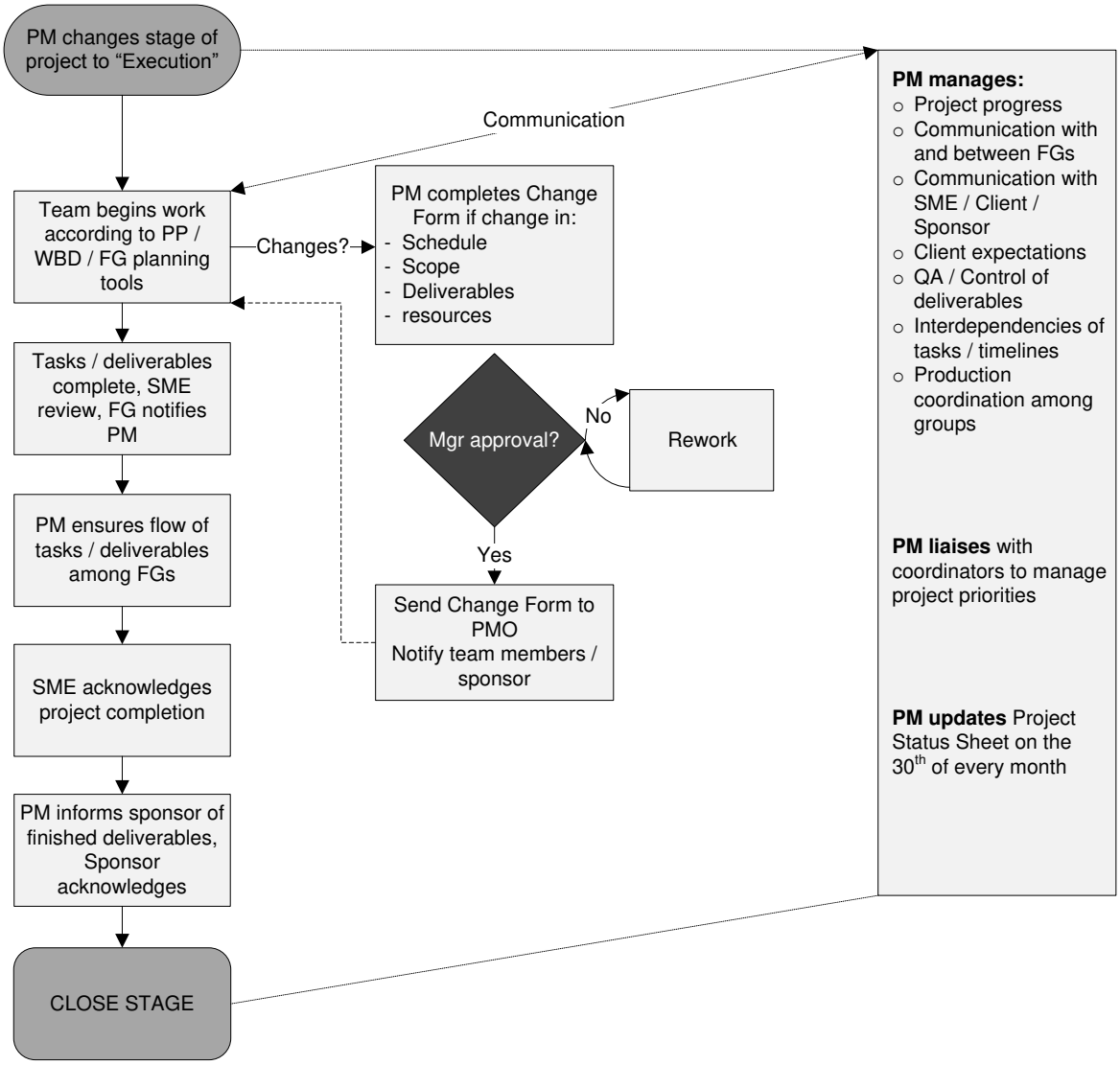

Figure 5-5: Alpha site: Project execution stage (Adapted from Alpha site source data, 2010)

5.5.3.1 Project execution (other factors)

As was the case with the Initiation stage, the respondents identified multiple factors not contained within the process documentation. More focused on practices and not processes including:

i. Developing prototypes (key milestone). [P]

ii. SMEs meetings with designers, technologists to develop the model. [P]

iii. Longer assessments, leading to initial storyboarding and better identification of materials. [Pr]

iv. Direct involvement with media designers allows them to contribute, see things unfold. [Pr]

v. Candid discussions regarding time line, deliverables reinforce sense of ownership. [Pr]

vi. Individual discretion exercised in production stage. [Pr]

vii. Post-meeting check-in with design team. [Pr]

viii. 'Technology should be there to to aid the student in the learning process, not the other way around.' [O]

ix. 'Culture doesn't support quick decision-making.' [O]

x. 'SMEs 'wants' are critical (but not always done).' [O]

xi. 'Perception that development, production phases parallel.' [O]

xii. 'Course developers who, with a tech/media bias feel it is in their right to dictate course of events.' [O]

5.5.4 Closure (documented processes)

As is the case with the other Alpha phase, every element is a process with little apparent room for negotiation or interpretation (see Figure 5-6). This stage contains elements of the 'Implementation' and 'Evaluation' phases of the ADDIE model.

i. Conduct final close-out meeting. [P]

ii. Prepare and archive documentation. [P]

iii. Document lessons learned. [P]

iv. Course developer efforts: involved in evaluation. [P]

v. SMEs cycle between evaluation and delivery. [P]

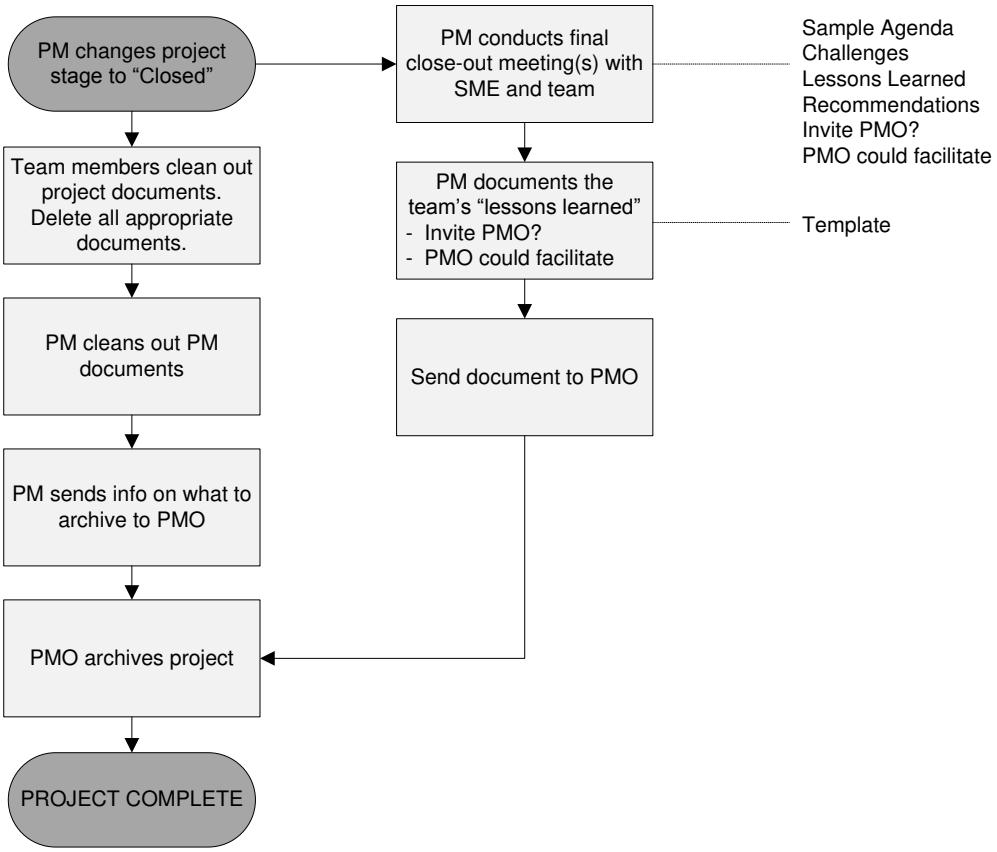

Figure 5-6: Alpha site: project closure stage (Adapted from Alpha site source data 2010)

5.5.4.1 Closure (other factors)

Multiple processes were identified in each of the Initiation, Planning, and Execution stages—as they are in the documented process map for the Closure stage. The difference is that respondents did not identify any processes within their own project management activities.

i. Define objectives: partner later with evaluation (doesn't happen). [Pr]

ii. Team does not practice true follow-up evaluation. [Pr]

iii. Many times end customer is not involved. [Pr]

iv. Interest in new projects dependent on pilot delivery. [E]

v. Archiving process (especially for digital items) doesn't exist yet. [Pr]

vi. Close-out meetings do not happen. [Pr]

5.5.5 Other management issues

Other management issues emerge organically from within the organization to influence the ADDIE model.

i. Communications: making sure everyone knows what is going on. [P]

ii. Work with external clients. [Pr]

iii. Individual groups (instructional designers, media designers) have their own 'work load' meetings that have no accountability to the Project Management Office. [Pr]

iv. Working with IDs who speak both technical and pedagogical languages. [Pr]

v. Dedicated communications efforts enable work with SMEs who lack technical expertise. [E]

vi. Subject-matter experts generally unavailable; ID/PM often sits back and waits. [Pr]

vii. 'Deans often do not understand importance of PM processes.' [O]

viii. ‘Poor staff ratio (developers to IDs).’ [O]

ix. ‘When PMs change (i.e., when projects go longer than expected), problems occur with no mechanism for redress.’ [O]

x. ‘Despite clear processes, varying customer demands will always affect processes.’ [O]

5.6 Adaptable variants

Variants were identified in the conceptual framework that emerged from the maturity model analysis, organizational management and higher education literature. For this research, an ‘adaptable variant’ contains two components: something is ‘adaptable’ when it is adjustable to different conditions; ‘variants,’ as a noun, is a person or thing that varies.

Leadership or creativity, for example, are both factors that are adjustable to different conditions, organizations or environments. They are necessary to both the Alpha and Beta sites, but interpreted and used differently depending on factors at each. As is the case with the ‘dynamic non-events,’ the concepts resonated strongly with the respondents, and additional items emerged—some with considerable influence on other elements of the framework.

Contradictions are found between many points—these are not mistakes. In a project management capability, such polarity is almost always unacceptable and reconciled in the name of efficiency. In higher educational institutions such as this (and the Beta site), this tension is real and largely acceptable—as evidenced by the coupling of instructional design roles with project management responsibilities. An examination of this (and related issues) will be discussed further below.

5.6.1 Academic freedom

A point of clarity for instructional designers, but contention for subject-matter experts, the line of ‘academic freedom’ was drawn between face-to-face instruction and digital delivery. With this in mind, the individual interpretation (on behalf of individual subject-matter experts) of what academic freedom means affects their approach to content development. Respondents noted that such internationalization

could not be addressed through broad policies or processes but by enabling one-on-one practices where possible. Despite this, several processes were identified:

i. Online courses/content developed by SMEs who are on ‘release time' belongs to the institute. [P]

ii. Create different IP arrangement for e-Learning projects. [P]

iii. Content development freedom belongs to SMEs in the classroom; in the digital environment, it belongs to the school. (One is tangible, one is not.) [P]

iv. Copyright is assessed for each project for all stakeholders, obtain necessary clearances. [P]

v. Academic freedom varies in importance to the participating subject-matter expert (some do not care). [E]

vi. Subjective internalization: some will differ in their interpretation of what it means to have academic freedom. This impacts their understanding of content development. [E]

vii. Emphasis placed on intellectual property in online project correlates to academic freedom. [Pt]

viii. Reviews cause friction with SMEs. [Pt]

5.6.2 Creativity

Creativity within this environment is essential—the challenge becomes managing projects emboldened by it. In their capacity as project managers, the instructional designers are especially concerned with this issue and ensuring that the creative impulses of the team not be overwhelmed. The following list is made up almost entirely of quotations—elements that would normally be characterized as ‘observations.’ In this analysis, they most succinctly crystallize the challenges to ‘operationalize’ creativity in a project management environment.

i. The project manager must strike a balance: support creativity, manage project management requirements. [Pr]

ii. ‘You can’t storyboard per schedule.’ [O]

iii. ‘Like when we were children…must allow for imagination time.’ [O]

iv. Ideas are passed along ‘chains of specialty.’ [E]

v. ‘A bit of discovery and meandering is allowed.’ [O]

vi. ‘How do you wrap creativity in a process?’ [O]

vii. ‘Documented processes don't support spontaneity.’ [O]

viii. ‘It's a creative 'process' that can't, ironically, be locked down. Ideas have to flow.’ [O]

ix. ‘It [the e-Learning project] is messy.’ [O]

    a. Their ability to limit their exploration, so when it is time to explore, to explore—and then when it is time to focus, to focus. [Pr]

x. ‘Subject-matter experts who lack a clear vision leads to problems.’ [O]

5.6.3 Culture

The interpretation of ‘culture’ varied, generally along management and staff lines. One emphasized the values of the organization (higher education as opposed to industry or private business) while the others focused more on more specific issues of leadership and team dynamic. Regardless of the focus, the relationship to and impact of ‘culture’ was not reflected in a process but nevertheless affects the management of these projects.

i. Leadership directly affects type, tone of culture (especially within teams). [E]

ii. Culture supports complacency: no sense of urgency. [E]

iii. Organizational silos reinforce loyalty along (union) positions. [E]

iv. Organizational context: the values of higher education must remain paramount (over the perceived ‘business’ nature of project management). [Pt]

5.6.4 Expertise

The involvement of instructional designers and multimedia developers at Alpha suggests policy decisions were made at some level to ensure those positions were on staff. Respondents did not identify themselves as such decision-makers.

Where strict policies end, informal practices and enablers begin, allowing the expertise of individuals to contribute in their own unique, flexible way to the management of the project.

i. An ineffective workload allocation process exists. [P]

ii. No internships, probationary period indicating progress as project manager. [P]

iii. Instructional designers are relied upon to bring own experience to project management activities (as opposed to formal training). [Pr]

iv. A ‘natural division’ of labour occurs amongst project managers: self-selection based on union regulations and self-interest. [Pr]

v. Collaborations lead to shared languages, institutionalized memory...leading to productive relationships. [E]

vi. Some training of instructional designer positions them as 'trustworthy candidate' for management of future projects. [E]

vii. Titles confirm jobs (regardless of skills, experience). [E]

viii. Beneficial to have different levels of experience. [E]

ix. Expertise barometer of trustworthiness (especially team leader). [Pt]

x. The Unit has broader skills (management, communications) with uneven distribution for application to project management activities. [Pt]

5.6.5 Funding

Connections were made between the provision of funds and management commitment, team morale and the individual reassurances of subject-matter experts. Individual processes lie behind each that indirectly support the team members within the e-Learning project team.

i. Opportunity recognition requires resources: not a routine matter. [P]

ii. Once funding was secured for 2-yr PMO position, priority shifted to use of role. [P]

iii. Funding commitments protect and reassure subject-matter experts. [P]

iv. Dependent on resources: drastically shortens schedule which limits project progress. [P]

v. Many projects are internal which absorbs resources. [P]

vi. Provision of professional development funds only to certain (union) groups dramatically affects morale and motivation. [E]

5.6.6 Instructional designer / Project manager

The instructional designer is a specific profession responsible for the design of instructional material (including face-to-face, distance education, and online). Within an e-Learning setting, instructional designers have consistently been regarded as the project manager given their own skills as well as their central role within the team. In addition to confirming this position, instructional designers indicate tensions between their role and processes of project management, and the influence union regulations have on other team members within the project teams they are responsible to lead.

i. Instructional designers must ‘make decisions based on educational theories.’ [P]

ii. Material accepted based on ID's ‘best knowledge.’ [Pr]

iii. Individual experience (as opposed to professional project management training) influences success. [E]

iv. Unbalanced distribution of workloads due to self-selection, union constraints for Project managers drastically affects projects. [Pt]

v. Many project management activities seen as clerical as opposed to 'bigger picture.' [O]

vi. Reluctant to have dedicated project manager group because of potential for 'negative conversations.' [O]

5.6.7 Leadership and management

'Leadership' is not found in the process documentation at the Alpha site, but it nevertheless exists as both a role (the leaders) and a dimension (leadership), it is undeniably a force within a project management environment—the only question relates to its interpretation. How will it manifest? What influence will it have? Who will serve as or be perceived as leaders? What will they do and what will team members do in response? In the Alpha site, these answers were provided to indicate both their importance to the practice and absence from the newly launched project management process documentation.

i. A partnership exists with schools to prepare project proposals: creates consistent, stable management into the project's management. [P]

ii. Collaborative sessions, individual consultations, process/procedure workshops support proposal development. [P]

iii. Centralized PMO unit provides leadership but not direct management. [P]

iv. Leadership pressure: quick delivery of projects, not establishment of processes. [Pr]

v. Project managers are self-selected to a certain degree: part born, part trained. [Pr]

   a. Project manager is 'part advocate, part diplomat, part jail guard.' [O]

   b. Trusted team leader regarded as candidate for future projects. [Pr]

vi. Funding agent perceived as 'the champion, someone who owns the process.' [E]

vii. Team (and project) culture stems from leadership. [E]

viii. Leadership affects willingness (of some) with respect to meeting project management mechanics. [E]

ix. Dean's uneven participation directly affects momentum. [E]

x. Leadership is sought but often not found when serious problems happen within project. [Pt]

xi. 'I [as an instructional designer] have to lead by example. To me, again, part of leadership is that trust.' [O]

5.6.8 Release time

While a necessary process associated with these projects, the implementation of 'release time' can be met with difficulty—the solution to which cannot be found in a process but left to personal willingness and subjectivity of the SMEs and/or their department heads. Consequently, various practices and other factors that can enable a positive outcome are injected into the management approach.

i. Separate agreement is needed to accommodate digital media production. [P]

    a. Even with agreement, actual release from school can be affected. [Pt]

ii. SMEs with release time must work with Unit: generates tension otherwise. [P]

iii. Release time helps Unit with implications for quality, other projects. [E]

iv. Frequent confusion amongst subject-matter experts about the relationship between their role and that of the Unit. [Pt]

    a. Many SMEs expect independence in developing online content based on face-to-face responsibilities. [Pt]

5.6.9 Teamwork (general)

A combination of specific professional disciplines and occupational groups contribute to the management of e-Learning projects—and some of them benefit from the projects as customers. A notable quality of these observations is the absence of practice-oriented data. While it is clear that the team must follow some processes (see earlier sections concerning Design, Delivery and Evaluation), it is not clear that processes underscore teamwork. Consequently, enablers, practices and general observations are relied upon here.

i. Respecting other team members' abilities liberates project management responsibilities. [E]

ii. Clear expectations needed for multimedia designers, programmers. [E]

iii. Course developer engagement is a useful 'trigger' to peak interest. [E]

iv. Personal connection helps teamwork: stops process focus. [E]

v. Poor staff selection reinforces process need and lack of trust. [E]

vi. Team design will vary: affected by project design and union influences. [Pt]

vii. Lost trust—precipitated by an individual or group within the unit—reflects upon the entire team, affects progress. [O]

viii. Problems surface with overlapping roles. [O]

ix. 'Hearing people's stories' is an invaluable activity; shows respect of them. [O]

x. Seniority (a union regulation), rather than skill, can determine project team participation: undermines trust. [O]

xi. Perceives trust as the primary environmental and teamwork element. [O]

xii. 'Right team:' experts, different skills, different personalities, different years. [O]

xiii. 'Engineering group say they live for process. Forget about the people. Forget about the culture. That's too warm and fuzzy.' [O]

xiv. Not multi-talented but willing to 'get their hands dirty.' [O]

5.6.10 Union / labour relations

Labour relations was an unexpected element to surface in the Alpha site data collection. Every respondent commented on it as it relates to their professional environment and the e-Learning project teams. To put the role of unions in a project management context, the union is not a stakeholder or participant in or advocate for the project but rather for the individual team members or occupational groups within it. In

this way, their influence can be felt but lies beyond the strict bounds of the project management capability.

i. Job descriptions dictate team member involvement. [P]

ii. Union agreements vary significantly. [P]

iii. Union representatives resolve projects on a project-by-project basis. [P]

iv. Union environment: team members' self-selection for roles. [Pr]

v. Roles overlapping cause union friction. [Pr]

vi. Competitiveness within team partially caused by union culture. [E]

vii. Union culture: the collective dominates (no hierarchy). [E]

viii. Negotiation is critical in this environment where 'management' is not accepted. [E]

ix. Union staff can pollute team environment and affect progress. [E]

x. Managers have no power whatsoever to influence the workload due to union regulations. [Pt]

xi. Strong personal feelings (not skill or experience) will dictate project participation among some instructional designers. [E]

xii. 'Lack of commitment [to project management processes] found in union mentality.' [O]

xiii. Managers have no influence—encourages passivity in some staff (hard to detect). [O]

xiv. Labour relations raises concerns about offending co-workers. Other sites [seem to] focus on collegiality.' [O]

xv. Instructional designers feel 'a bizarre sense of loyalty' to non-union team members: will avoid 'managing' them. [O]

xvi. Lack of member skills participating in project (union allowances). [O]

5.7 Dynamic non-events

This concept refers to a stable outcome – but one that is achieved through constant change rather than continuous repetition. 'Safety,' the example provided by Weick and Sutcliffe (2001, p. 30) comes as a result of a change in one system parameter compensating for a change in another. Achieving stability in an e-Learning project environment, requires practices and enablers that do not always lend themselves to a process.

Tacit and ephemeral qualities are the focus here—trust, attitude, motivation, loyalty, among others—factors that help stabilize a changing system through the power of their own flexibility. In the words of one respondent, 'Trust is number one. Teamwork culture, those are very big and in the absence of these, then process we can fall back on.'

5.7.1 Acceptance

Taking or receiving something when offered, either through tacit or explicit communications. In project environment, 'acceptance' could be of the project itself, individual responsibilities, project management processes or demands and/or other factors.

i. Funding commitments reassures subject-matter experts. [E]

ii. New office, processes are indicators of acceptance / rejection of project management principles. IDs are especially important to this. [E]

5.7.2 Attitude

As an ephemeral quality, 'attitude' was frequently a direct reference or allusion to team dynamics and the resulting impact on project management performance. The attitudes of virtually all team members were noted.

i. Dean's attitude toward project manager (and project management generally) drastically affects momentum. [E]

ii. Lack of recognition [by management] affects attitude. [E]

iii. Mutual understanding of roles: to reinforce team attitudes, and to reinforce project manager's vision. [E]

iv. Manager, Project Management Office, as advocate, affects attitude for all projects and project managers. [E]

v. Personality issues always affect attitude of team members. [Pt]

vi. 'Just like get this through and let's do it in a timely manner and let's do, 80 percent of what we want to do, hope for 100.' [O]

5.7.3 Commitment

Enforcing a new process-centric approach to managing e-Learning projects was the challenge for respondents. The nature and/or type of engagement by those individuals (or other elements of the organization) was identified as a factor that affected how that management took place.

i. Unit management can commit resources after recognition of a problem. [P]

ii. Commitment comes from team (especially SMEs, designers) seeing project in development. [Pr]

iii. Personal connection is needed by PMO, particularly when organizational units are dispersed. [E]

iv. ID commitment to process must be 'inside and out.' (Absence has project implications.) [E]

v. Work with designers reinforces SME commitment. [E]

vi. Commitment stems from institutional values. [E]

vii. Student engagement is a useful 'trigger' to peak their interest. [E]

viii. Customer involvement, commitments ('ownership') are essential. [Pt]

ix. 'Evidence of lack of commitment can be found in union mentality, inactive participation.' [O]

x. Commitment to understanding the environment can be higher with effective communications. [O]

5.7.4 Loyalty

The state or behavior of being faithful to commitments or obligations. In an e-Learning project management environment, 'loyalty,' could range from faithfulness to one's employment conditions to project demands (communicated through team members).

i. Loyalty to union regulations affects decision-making. [E]

ii. Loyalty is behind this site's culture (will affect management decisions). [E]

5.7.5 Morale

Defined as the emotional or mental condition (with respect to cheerfulness, confidence) in the face of difficulty or stress. How do project team members cope with and perform in the face of difficulties when managing e-Learning projects?

i. Give non-union staff opportunities to participate in presentations, identify conference interests. [Pr]

ii. Tied to attitudinal factors. [E]

iii. Project management in a union environment is heavily reliant on good will and professionalism. [E]

iv. It is important to be aware of personal situations. Showing compassion will lead to greater commitment and opportunities for empowerment. [E]

v. 'Constant churning out material;' lack of professional development opportunities affects morale. [O]

5.7.6 Motivation

Motivation can be a specific factor or become a state of being for one or more members of the environment. In either case, motivation becomes an issue when SMEs (with varying levels of skills and

knowledge) are learning to work together, and the environment is affected by elements (e.g. unions) that do not affect the project directly but the team members responsible for it.

i. Motivation comes from team members seeing project in development. [E]

ii. More funding: project success. [E]

iii. Team members (from a union) perceived with lesser skills affect motivations of others. [E]

iv. The development team in different union: fewer opportunities. [Pt]

v. 'Developing plan is easy…getting them to use it is hard.' [O]

vi. Union regulations affect pay scales - affects motivation. [O]

5.7.7 Momentum

Constituents of a project management capability can come in non-physical forms (such as an idea, or creativity). Maintaining the impetus behind these elements is a function of momentum and can be affected by multiple factors.

i. Seasons typically slows momentum. [Pt]

ii. SMEs, resources, multimedia can frequently be unavailable. [Pt]

iii. Culturally, the unit operates on a '60-minute is 3 hours' mentality (a long-held characteristic of the organization). [Pt]

iv. Important to have the ability to limit their exploration in order to focus on the next step. [Pt]

5.7.8 Trust

A project management capability is a function on which teams (and organizations) rely. But that reliability consists of multiple nuanced factors—indeed this question goes to the core of this research. With this in mind, 'trust' is explored to see which qualities (if any) affect the integrity and ability (among others) of the project management capability:

i. Time not spent on kick-off meetings, undermines team cohesion and trust. [Pr]

ii. Essential for teamwork. Good will and respect liberates other team members. [E]

iii. Trust should be 'negotiated' to address working relationship and avoid tension and uncertainty. [E]

iv. More negotiation with course developers is necessary for design, development and evaluation. [E]

v. Experience reinforces trust. [Pt]

vi. Without trust, project management time and resources are wasted. [E]

vii. Reliable management of e-Learning projects by all team members could not happen without trust. [E]

viii. 'Trust' is not explicitly discussed at various process stages. [O]

ix. 'Clients must trust team, unit.' [O]

5.8 Synthesis of data: Alpha site

The focus of the case study (Project #2) is to identify the processes, practices, enablers and properties that contribute to an organization reliably managing a project with limited definability. The following meta-matrices answer this question (for the Alpha site) by distilling the processes, practices, enablers and properties from the data provided above. To understand in the context of the e-Learning environment, they have been associated with individual e-Learning project team members.

5.8.1 Sponsor factors

It was clear at the Alpha site that the Sponsor had a supportive role to play in project management activities—and by 'supportive' it is meant that they have no direct managerial responsibilities. Labour relations, which negotiate job descriptions and dictate union involvement by different professional (and

organizational) groups, preclude management from 'directing' staff in any project management activities as well as from dictating actual terms of the agreement. Their role, as indicated in Table 5-5, is more of an enabler to the environment but not the specific project.

Table 5-5: Alpha site: partial meta-matrix - sponsor factors (Pasian, for this research)

Processes	Practices	Enablers	Properties
Support intradepartmental project proposal mechanism. Communicate union agreement information.	Supports application of broader skills (management, communications) to project management activities.	Supports slow decision-making culture. The absence of managerial hierarchy cultivates a union culture. The power to negotiate becomes more critical in an environment where 'management' is not accepted. Lack of recognition (by management) affects staff attitude. Managerial commitment stems from institutional values.	Promotes the values of higher education over the perceived 'business' nature of project management.

5.8.2 Project management office factors

The PMO had similarities with the Sponsor in that it had no direct managerial responsibilities for project management teams or the day-to-day activities of the project. It has two primary roles: intermediary (between various roles), and advocate (but not director) of processes and instructional designers (see Table 5-6).

In this latter role, this Manager adopted a personal approach to maintain the lines of communication amongst team members. This was not a requirement of either the position or the organization, but rather a personal choice on the manager's part to initiate and then maintain a dialogue amongst team members – to effectively create and communicate an 'open door policy.' As the change agent responsible for the creation of new project management processes and templates, this was an important strategic choice to

reinforce the new organizational tools. But again…such advocacy was not stated or codified anywhere—it was one individual's choice to enable the adoption and ongoing use of project management processes.

Table 5-6: Alpha site: partial meta-matrix - PMO factors (Pasian, for this research)

Processes	Practices	Enablers	Properties
Serves as intermediary for project priorities (determined by schools). Laising with external clients. Directs collaborative sessions, individual consultations, process/procedure workshops support proposal development. Commits resources after recognition of a problem. Contributes to (but does not direct) workload allocation process. Acknowledges phase completion.	Communicates with various formal and informal tools. Observes selection of project team membership. Provides leadership but not direct management.	Communicates; helps new processes go smoothly. Leadership affects willingness (of some) with respect to meeting project management mechanics. Adherence to union regulations affects decision-making. As advocate, affects attitude for all projects and project managers. Personal connections for dispersed organization.	Inconsistent leadership when serious problems happen within project.

5.8.3 Instructional designer / project manager factors

The Alpha site confirmed the reliance by the instructional designer upon non-process factors. The analysis reveals the significant use of informal practices and enablers to support team dynamics, creativity and the ongoing capacity to meet project deliverables (see Tables 5-7 and 5-8).

Table 5-7: Alpha site: partial meta-matrix - ID / PM factors (Pasian, for this research)

Processes	Practices
Focuses efforts of dedicated professional group. Assesses nature and scope of the project. Determines suitable proposal for project plan. Prepares appropriate documentation for management review and/or planning. Secures approvals (where appropriate) at various management levels. Confirms task assignments; develop additional tools as necessary. Conducts needs assessment prior to written or design planning. Moves project to Execution stage. Move to 'close' stage. Documents lessons learned. Conducts close-out meeting.	Start up meeting necessary (but often does not happen). Additional tool development. Deliberate avoidance of project management tasks. Acceptance of process maps. Longer assessments, leading to initial storyboarding -- better identification of materials. Post-meeting check-in with design teams. Partnering of objectives later with evaluation does not happen. Communicates with all team members (different techniques). Strike a balance: support creativity, manage project management requirements. Relied upon to bring own experience to project management activities (as opposed to formal training). Availability of professional development funds dramatically affects morale and motivation. Individual groups (instructional designers, media designers) have their own "work load" meetings. Content/material accepted based on ID's "best knowledge." Self-selected to a certain degree: part born, part trained. Trusted team leader regarded as candidate for future projects. Time not spent on kick-off meetings, undermines team cohesion and trust.

With the introduction of new project management processes, the Alpha instructional designer was responsible for their implementation… a welcome development by some: 'Others are seeing it [the

new process] with a sense of relief…partly because not everyone has the same background in project management. And so if there's a particular process that we're going to be solving in here, I can just follow the chart and know what to do.'

The change represented a challenge for these professionals as they tried to strike a balance between their new responsibilities, the limitations of their managerial role, and the demands of specialized professionals (SMEs and course developers/designers/programmers). Meeting this challenge generally came as a result of creative, spontaneous individualized practices conceived of by each ID.

Table 5-8: Alpha site: partial meta-matrix - ID / PM factors (Pasian, for this research)

Enablers	Properties
Individual discretion is a factor in accepting processes. 'Bilingualism' working with both technical and pedagogical languages is beneficial. Collaborations lead to shared languages, institutionalized memory...leading to productive relationships. Training of instructional designer positions them as 'trustworthy candidate' for management of future projects. Beneficial to have different levels of experience. Titles confirm jobs (regardless of skills, experience). Individual experience (as opposed to professional project management training) influences success. Personal connection helps teamwork: stops process focus. Poor staff selection reinforces process need and lack of trust. Respecting other team members' abilities liberates project management responsibilities. Union staff can pollute team environment and affect progress.	Unbalanced distribution of workloads for project managers drastically affects projects. Team design will vary: affected by project design and union influences. Lost trust—precipitated by an individual or group within the unit—reflects upon the entire team, affects progress. Strong personal feelings (not skill or experience) will dictate project participation.

Competitiveness within team partially caused by union culture. Trust should be 'negotiated' to address working relationship and avoid tension and uncertainty. Mutual understanding of roles: to reinforce team attitudes, and to reinforce project manager's vision. Give non-union staff opportunities to participate in presentations, identify conference interests. Project management in a union environment is heavily reliant on good will and professionalism. IDs respect of new PM office critical to process acceptance. Personality issues always affect attitude of team members.	

5.8.4 Department head factors

This role has little direct involvement in the management of e-Learning projects, but does indirectly enable the introduction of new processes as well as the reinforcement of cultural dynamics—often to the detriment of the project management activities (see Table 5-9).

Table 5-9: Alpha site: partial meta-matrix - department head (Pasian, for this research)

Processes	Practices	Enablers	Properties
Intentionally blank.	Intentionally blank.	Supports evolution of new processes (that allows new projects to thrive). Associated with organizational silos that reinforce loyalty along [union] positions. Leadership directly affects type and tone of culture (especially within teams).	Seasons typically slows momentum. Culture supports complacency: no sense of urgency.

5.8.5 Subject-matter expert factors

The development of content is the primary responsibility of any subject-matter expert in an e-Learning project. Surrounding processes, practices, enablers and properties at the Alpha site indicate, however, that content development is heavily dependent on these other factors, most of which are context-specific, can only be tailored to the demands of the specific subject-matter expert in question, and must reflect the specific creative dynamics at work in the project (see Table 5-10).

Table 5-10: Alpha site: partial meta-matrix - SME factors (Pasian, for this research)

Processes	Practices	Enablers	Properties
Separate agreements determined for SMEs ('release time') for content development. Different IP arrangements determined for online content. SMEs with release time must work with Unit.	The schedule of the subject-matter expert must be carefully managed. Satisfying SMEs 'design wants' are critical (but not always done). SMEs cycle between development, delivery and evaluation.	Participation expands their skills, knowledge for future projects. Personal attention helps trust. Dedicated communications efforts enable work with SMEs lacking tech expertise. Subjective internalization: some will differ in their interpretation of what it means to have academic freedom (impact content development). Ideas are passed along "chains of specialty." Funding commitments reassure SMEs. Motivation comes from team members seeing project in development. Work with designers reinforces SME commitment. Problems created by SMEs who lack clear vision.	Projects vary in importance to the participating subject-matter expert (some don't care). Funding commitments protect and reassure SMEs. Not considered technically savvy. Some seen to have agendas. Emphasis placed on intellectual property in online project correlates to academic freedom. 'Expertise' barometer of trustworthiness (especially team leader). Frequent confusion re their role and that of the Unit. Classroom content: theirs. Online content: school's. (One is tangible, one is not.)

Of particular importance with these professionals are the enabling factors that reinforce their initial commitment and ongoing involvement. Demonstrations of individual interest (on the part of the instructional designer) to encourage their creativity, and personal assurances to respect their expertise are especially helpful.

Individual SMEs vary in their interest in and approach to e-Learning projects. Many are enthused by new social media and eager to work with the technology to increase their access to and engagement with students. Others are more ambivalent, engaging in projects to fulfill professional commitments identified by their departments. A common characteristic amongst most is a low degree of technical knowledge and comfort.

5.8.6 Course developer

In the Alpha environment, course developers were junior members of the team, often 'put upon' by the limited professional station they occupy due to their union allocation. As their supervisors, instructional designers were aware of this tension and made deliberate efforts to encourage their ongoing creativity and general morale through specific informal practices (see Table 5-11).

Table 5-11: Alpha site: partial meta-matrix - Course Developer factors (Pasian, for this research)

Processes	Practices	Enablers	Properties
Direct involvement with SMEs and design meetings. Evaluates technology through prototype.	Despite clear processes, varying customer demands will always affect processes.	Clear vision needed for multimedia designers, programmers. Negotiation necessary for design, development and evaluation. Technical skills, perspectives may vary. Enthusiasm contributes to multimedia development. Engagement is a useful 'trigger' to peak interest in final course offering. Customer involvement, commitment ('ownership') are essential to project evolution. "Technology should be there to aid the student in the learning process, not the other way around."	Different student learning needs offer a different perspective on project, content development. Enthusiastic despite varying levels of project experience.

Having said this, course developers were in the position to influence how projects are managed. Typically junior members of the team, course developers are technology advocates—always at the ready to explore software and hardware in an effort to render compelling content. Partnered with supportive instructional designers, this duo is responsible to technology in creative, innovative ways in support of the learning objectives identified by their colleagues.

5.8.7 Revised conceptual framework: Alpha site

Based on the Alpha site analysis, the conceptual framework can be revised (see variations in Figure 5-7 in bold text.) An analysis of the revised elements —based on a comparison with the Beta site—will occur in Section 5-15.

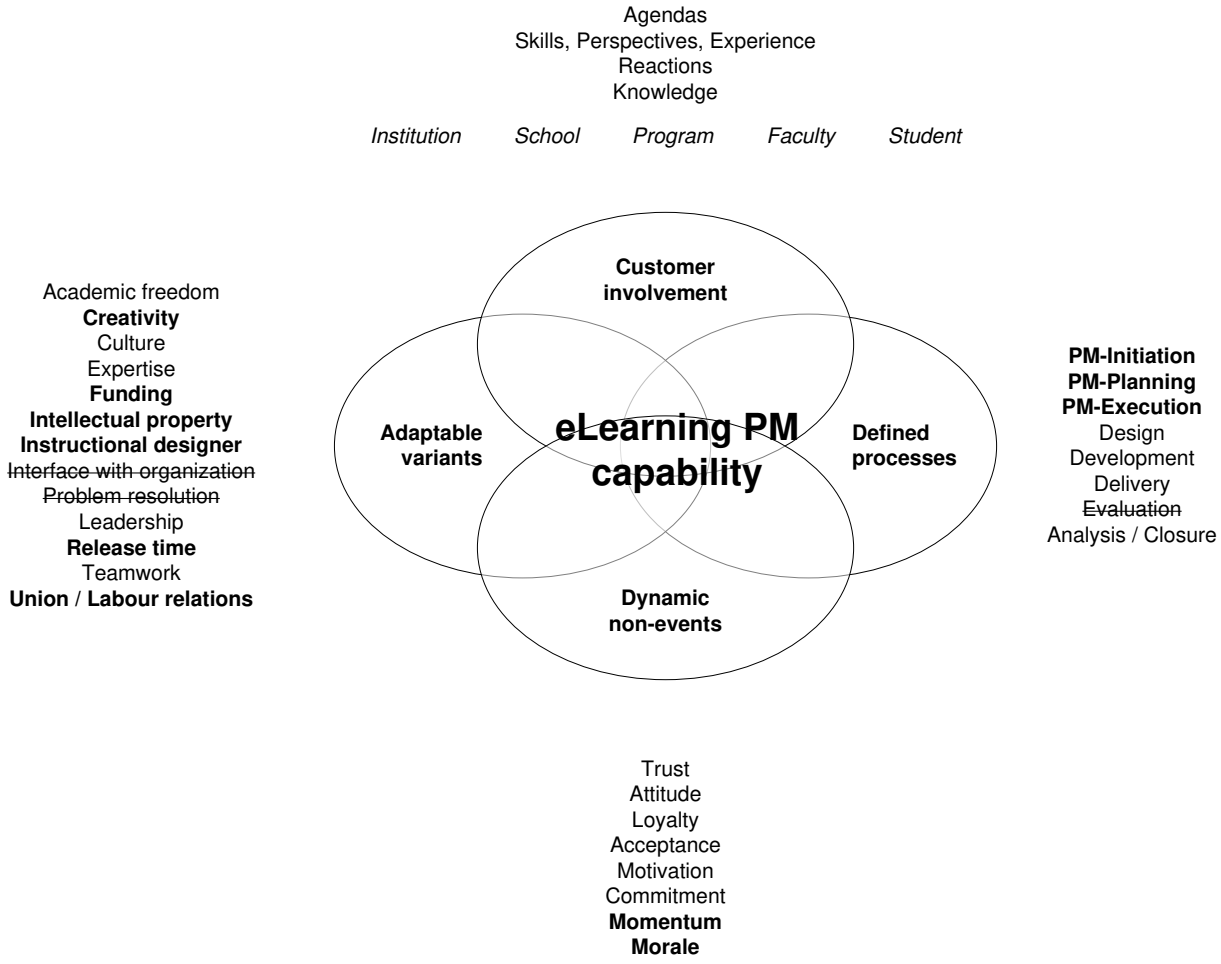

Figure 5-7: Revised conceptual framework—Alpha site (Pasian, for this research)

5.9 Case study: Beta site

5.9.1 Description

'Beta' is a major university serving approximately 60 000 students (full- and part-time) in a large urban community. An extensive catalogue of undergraduate and graduate faculties are available as well as research programs in myriad disciplines, professional schools and a department of continuing studies. 8 000 (full- and part-time) faculty support these teaching, learning and research demands.

Four modes of delivery are used at the Beta site: face-to-face, online, distance education and mixed mode (any combination of these). As was the case with Alpha site, an entire unit exists to support the teaching and learning initiatives within the university and sits beneath an executive academic role.

The Unit offers four services to the university:

1. Support the planning, funding, development and delivery of business education for undergraduate and graduate courses;

2. Focus on emerging technologies through evaluation and maintenance;

3. Business operations to address funding, financial tracking and reporting (in relation to the delivery of courses); and,

4. Receipt and management of tuition revenue associated with business courses (sometimes including the appointment of SMEs and/or transfer of funding to departments for their hiring).

An integral element to the fulfillment of these functions is the use of information technology. The university's position on technology-enabled learning is made clear in its strategic organizational policy:

> Technology now shapes the teaching and learning experience, with interactive learning, communications technology such as the internet, email, text archives, online catalogues and social networking such as Facebook and Twitter being second nature for today's students. The costs of integrating appropriate technology into learning and research is considerable, but educational institutions at all levels recognize the power of technology to reinforce and enhance teaching and research.

Similar to Alpha, certain professional occupations and organizations roles are involved in the management of e-Learning projects. For the purposes of this research, however, only those relevant to the management of e-Learning projects were chosen.

5.9.2 Team roles

The team roles originally targeted for interviewing did not entirely match with those provided at the Beta site: a senior manager (of the Teaching and Learning Unit) and a production manager. Both roles were explained during the site visit and participated as interview subjects. Table 5-12 summarizes what was expected and provided.

Table 5-12: Beta site - team roles (Pasian, for this research)

Role	Expected	Provided
Course developer	Yes	Yes
Instructional designer / Project manager	Yes	Yes
Sponsor	Yes	Yes
Subject-matter expert	Yes	Yes
Unit / Department Head*	Yes	Yes
Manager, Project management Office	No	Yes
Production Manager	No	Yes

*Exact type of department head could not be identified prior to site visit.

5.9.3 Project types

Respondents at the Beta site were also asked to identify the projects managed within their Unit. This list summarizes their responses:

i. online courses (fully online so they could be delivered at a distance or in an alternate to full time day study);
ii. hybrid courses (some components are online maybe self tests, discussions or a module) these could be delivered in the full time day program or an alternate delivery such as course work online;
iii. distance education courses; and,
iv. technology projects (e.g. web game, simulation, multi media objects) to be used in a course or for some other reason.

5.10 Customer involvement

5.10.1 Identification

Beta site customers were varied and included members internal to the Beta site and external from it. Almost all respondents identified distinct customer types. The following summarizes the customer list:

i. The school community, including senior management and 'shadow customers' (for credit courses);

ii. External clients / business owners (for non-credit courses);

iii. Advisory committee;

iv. Individual departmental staff and SMEs;

v. Programs , Departments for which SMEs work; and,

vi. Students.

5.10.2 Skills, perspectives and experiences

Although six customer types were identified, when asked specifically about skills, perspectives and experiences, limited data was provided.

i. Subject-matter experts

    a. 'Not considered technically savvy.' [Pt]

    b. Additional instruction [for them] directly affects design. [Pr]

ii. Students

    a. Different learning needs offer a different perspective on how the project. [Pt]

    b. 'Technical skills vary amongst students,' along with their perspectives. [O]

c. Despite these variations, however, training to compensate for the absence of skills was generally not required during the project. [Pr]

d. Students, unlike SMEs customers, affect the project with enthusiasm, an understanding of the student body, and lacking cynicism. 'They are not jaded because of their varying levels of experience.' [Pt]

5.10.3 Agendas

Respondents detailed agendas based on customer type. They are categorized as follows:

i. Department or program academic goals will always trump project or Unit interests.

ii. Some SMEs are highly motivated—particularly when their department approves involvement. They are eager to heighten their engagement with students by using various technologies, including social media.

iii. Other SMEs (or departmental staff) want to pursue a multi-course development program—often with innovative material, design and technology. These demands put extra pressure on the Unit staff, especially with competing agendas (from other departments) for developers and other resources.

iv. External clients often have their own particular unique needs and project management approaches which can make collaboration with internal staff problematic.

5.10.4 Knowledge

Three key customers were identified: students, SMEs, and business owners (from outside the university). Their sources of knowledge (or willingness to acquire it) varied considerably with students being most knowledgeable (about technology—not design), business owners fully capable of discussing their own requirements but not technology, and SMEs lacking knowledge about both technology and its use in a teaching and learning environment.

i. Students were the most knowledgeable about technology, but lacking knowledge in how to incorporate it into a design environment for ultimate teaching and learning needs.

ii. Most SMES working with project teams lacked knowledge largely about the technology and, to a slightly greater extent, about the instructional design process. ('Slight' in the sense that their classroom teaching experiences may have provided them some insight.)

iii. 'Business owners' (external clients offering non-credit courses through the Beta site) are not technically astute but can clearly define their business requirements. They also like to participate in team meetings and are keenly interested and enthusiastic about applying technology to address their business requirements.

5.10.5 Reactions

Discussion concerning reactions was limited to SMEs members who, until recently, had not benefited from technology-enabled resources 'beyond the classic support of audio-visual equipment.' Anxiety was noted as the typical and understandable reaction amongst a group uncertain as to how to use more sophisticated information technology, much less position it along the teaching-learning continuum.

5.11 Defined processes

Documentation was provided describing the Unit's project management approach: it included a project planning document, a questionnaire for project proposals, a letter of agreement, and a description of funding criteria. The only 'process diagram' provides a macro perspective of the design, development, production, implementation and evaluation steps that a project team would follow (Figure 5-8).

This illustration largely follows the ADDIE model (with slight changes in language – 'feasibility planning' as opposed to 'assessment'). It partitions the management of e-Learning projects depending on their type – those that require 'major revisions' are positioned earlier in the cycle (requiring greater project management activities) than projects that require only 'minor revisions.'

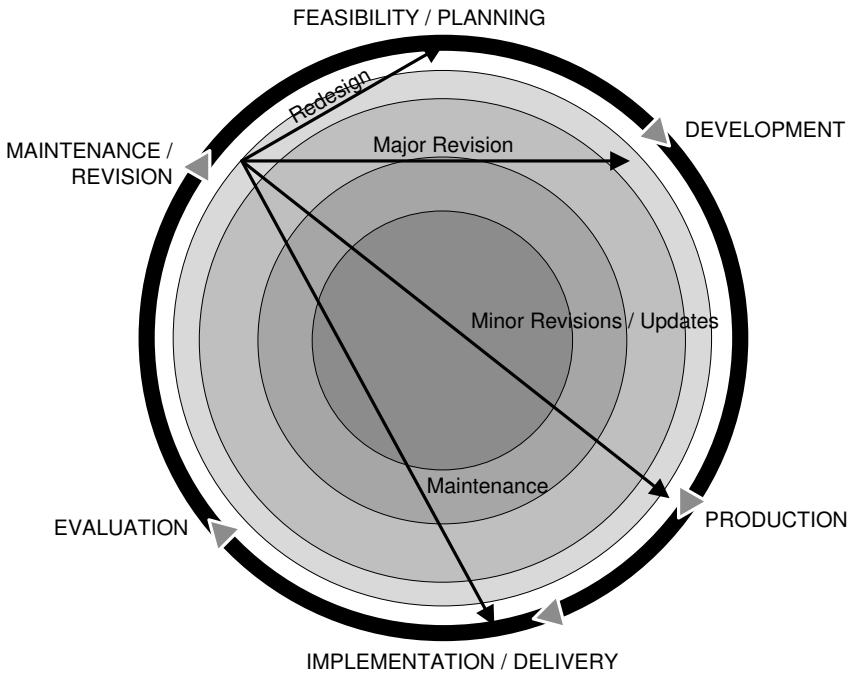

Figure 5-8: Project management perspective: Beta site (Adapted from Beta site source data, 2010)

5.11.1 Needs assessment

Specific processes and dedicated personnel characterize Beta's needs assessment activities. A key goal is to introduce a preliminary and stable technology solution for later development amongst agreeable stakeholders.

i. Strategy manager meets with the development group, the client to go through a needs assessment. [P]

ii. A business analyst and project manager: take the needs / requirements, translate them into a technical solution, and define the scope (at a high level) for a potential project. [P]

iii. Gathering requirements to conduct needs assessment (need stakeholder, signoff). [P]

iv. 'Exploration process:' lead identified; exploration of client's goals, logical needs. Moves into the creative endeavor (search or build from scratch). [P]

v. Creative: wire frames[10] from their perception of what the client just told them. [Pr]

vi. Needs assessment: you can generalize certain aspects to accommodate different contexts. [Pr]

vii. 'Creates sense of joint ownership.' [O]

viii. 'Have to be mindful of different project contexts.' [O]

5.11.2 Project approvals

It is with these elements—project definition, project approvals and prioritization—that one can see the growing requirement for flexible SME involvement to accommodate the strict project management policies (e.g. approvals) that is growing into a greater creative involvement.

i. Explicit approval: to avoid disorganized management / development of courses. [P]

ii. Negotiations lead to project MOU, followed by individual projects. [P]

iii. Sponsor talks to our distance education manager, secures approval. Project manager assigned. [P]

iv. SMEs do not consider themselves part of that process, but their sign-offs are needed. [P]

v. Those goals have to be distributed back out to the people who are sponsoring the project, people who are the stakeholders. [P]

vi. 'The project manager doesn't hold all of the goals in his or her pocket.' [O]

vii. 'At the heart of this is the academic side of the operation not owned by us. These courses are owned by the department and the SMEs.' [O]

5.11.3 Planning

Many processes of the management of e-Learning project start with the Planning stage including scheduling, work assignments, project checklists and various 'start up' documents. Understandably, the

[10] See Section 1.6, Table 1-1 for a definition of a 'wire frame.'

Planning stage has one of the larger allocations of processes when compared to the other elements of the Beta cycle.

i. Initial project design: preparation of documents for tracking milestones (from a curriculum development, resources). [P]

ii. Identify, manage risks, budget, schedule. [P]

iii. It is a two-year window: get a project starting from development (January, May, and September). [P]

iv. Depending on project needs, team roles change. [P]

v. Various scheduling activities reflect project demands and broader university demands. [P]

vi. Develop online course with course author. [P]

vii. Project manager works with the production team (to enforce deadlines). [P]

viii. Project manager works with the course author: meeting content writing deadline (needs flexibility). [P]

ix. Production team assigns work (third month). [P]

x. Maintenance is ongoing for existing courses (work behind the scenes). [P]

xi. New project requires scheduling into the system (included in the catalogue). [P]

xii. Tool: startup checklist: what needs to get done before the push is launched (everyone is responsible for updating). [P]

xiii. 'Checklist' documents indicates problems which get flagged. [P]

xiv. Project identification, prioritization and approval (developed as a process outside of PMBoK) to be outside of delivery using a project proposal form. [P]

xv. ‘Socialized project charter’ as a result of leadership. [P]

xvi. New approach to charter, scope definition generated trust and respect from leadership. [P]

xvii. Preparation of ‘demand management process stream’ illustrates over-commitments. [P]

xviii. SMEs often get involved in project inception, writing proposal all the way to completion. [Pr]

xix. Status meetings often become coaching sessions. [Pr]

xx. Mixed practices: IDs encouraging structure around experimental plans, but drawing up a project plan does not occur. [Pr]

xxi. ‘Control is often absent.’ [O]

xxii. ‘Distance education process informs e-Learning processes (DE documents direct e-Learning projects).’ [O]

5.11.4 Design

The words of one respondent captured the tension between the known stages of e-Learning design models and a need for free-thinking creativity, and the defined processes of project management. ‘Meeting process-imposed deadlines may run over people…for e-Learning projects, design has its own unique meanings and demands that typically can have little resemblance to project management stages.’ The data points below speak to this tension (although it is addressed in various places throughout the data).

i. Early steps in planning are intended to help us to make better scope decisions combining project management and instruction design. [P]

ii. Preparation of an internal template that can support an environmental scan (identifies needs of high level budget, high level goal structure). [P]

iii. A wire frame is one of the first stages in terms of a website: the customer describes their goal (which translates into functional requirement for the website). [P]

a. Designer comes back and says, ‘This is a wire frame: shows the layout of the website, its function, simple mockups, functionality. [P]

iv. Design process associated with distance education courses directly supports online course development. [E]

v. Unit management considers the instructional design model ideal. [E]

vi. There are some assumptions at the beginning concerning design space, the environment and tools. [E]

vii. Management 'flexibility' could require training or working with course developers to help them understand the process of designing a learning environment. [E]

viii. ‘High level’ design requires flexibility on outset of project structure to make shifts and adjustments as we need to. [E]

ix. Some project goals will continue to be emergent. Things will be learned via the process not known at the beginning. [Pt]

x. ‘You need to be able to interpret the value of project management processes within a context that is broader than that which is defined by project management… However, the perspective needs to be supported that everything could be invented within the project.’ [O]

a. Conversely (one respondent offered): ‘To be successful as a project manager at a research institution, if your mandate is in support of the academic goals of your organization, you need to be able to see beyond the language of project management.’ [O]

5.11.5 Development

In the management cycle used within Beta, the development phase is a necessary function of the major revision of a course. Respondents identified several processes (and associated properties) but no enablers.

i. When problems surface: we are in the midst of creating feedback meaningful points (scheduled points or at different stages of the development process where we have anticipated delays or problems). [P]

ii. Timelines not met, last minute new projects: response is to 'condense processes.' [P]

iii. Missed content development deadlines forces changes in expectations for project. [P]

    a. 'If project A is stuck in the works: apply conversation or leverage to move it forward or move it aside to finish and go forward (reschedule it to bring the conversation back to the people who need me to be talking about it).' [O]

iv. SME has little time for content; meeting deadlines almost impossible. [Pr]

v. SMEs are difficult to manage through multiple phases: course management; content design and development; signoff. [Pr]

vi. Lack of technology understanding dramatically affects SMEs approach. [E]

vii. Length of time of course development will vary depending on how prepared that client is with the biggest problem. [Pt]

viii. Documentation is essential. [Pt]

ix. Design and development are on top of each other. [Pt]

x. Develop a wire frame in one of the first stages of Web design to give the subject-matter expert an opportunity to describe what they are trying to do—specifically functional requirements. [P]

    a. Subsequently, our designer comes back and says, 'This is a wire frame and it just shows you the layout of the website, how it's going to function, the sort of simple mockups of the website itself for a design or just functional.' [O]

5.11.6 Evaluation

A typical evaluation within Beta involves identifying the initial goals of the project in a documented process that needs to be reported back within context of project. The fundamental question—is the course affecting student learning?

i. Cycle between evaluation and delivery: whatever comes back from a focus group will go back to delivery cycle (before launch). [P]

ii. Evaluation can focus on tools to support professional development side of team members (in addition to individual courses). [P]

iii. Clients need convincing regarding the need for evaluation. 'If they do not agree with us, we run the pilot want and re-evaluate this afterwards.' [Pr]

iv. 'When we releasing sections, we do not typically have control over content revision.' [O]

v. 'We might not have an evaluation piece at all if there is no time. Sometimes they are building the course as the course is being run.' [O]

vi. Limitations of course contract funding dictates scope of evaluation. [Pt]

5.11.7 Closure

Little data was provided concerning project closure processes, only general observations that profiled a phase still unresolved.

i. 'We have not figured this out yet. Sometimes after closure, the project moves to service (depending on the evaluation).' [O]

ii. 'When the event closes: we could have a 50-page report from it…or not.' [O]

iii. 'Cultural challenge: instilling that project management staff close things off before they run on to the next.' [O]

5.11.8 Change management

A key point of difference between Alpha and Beta: the latter has an organizational change management capability to support the project with an emphasis on processes.

i. Before the project starts, we address the question of responding to scope change. [P]

ii. Scope change occurs through a process with management relevant to that element of the project. [P]

iii. Managing change: establish the opportunity for some patience with the process (some trust that we are helping them negotiate through organization). [Pr]

iv. New resources open up to support creative space for them. [E]

5.11.9 Communications and reporting

In their role as project managers, instructional designers are obliged to follow processes to keep management informed. This is commonplace for any project management environment, but tailored depending on the nature of the work, organizational requirements and management demands. The remarks provided at the Beta site partially reflect these reporting qualities.

i. Reporting: pulling a team together, calling meetings, identifying the objectives to associate them with evaluation and outcome. [P]

ii. Weekly reporting to discuss week's accomplishments, plans for following week. [P]

5.12 Dynamic non-events

5.12.1 Acceptance

In this environment, ‘acceptance’ speaks to acceptance of the process, the people from within both the SMEs and instructional design groups, and the necessary work toward building the creative space. The dynamic non-events contained within this node all relate to each other to varying degrees along these three themes.

i. Reinforcing acceptance comes back to the negotiation—within project conversations and activities—that address the context, and agreed upon goals. [Pr]

ii. 'Priorities of the day job' are balanced by the client against the project demands. Typically the 'day job' comes out on top. [Pr]

iii. Status meetings have evolved into coaching sessions: reinforce acceptance of project management. [Pr]

iv. Acceptance of project management expertise is often based on client need. [E]

v. Trust can result from showing a stakeholder benefits of a process-centric model. (With this basis, more curriculum-focused activities can occur.) [E]

vi. 'In this case, it's expected that trust is expressed after something is completed, not in anticipation of its completion.' [O]

vii. These efforts are all part of 'the building of the creative space.' [O]

viii. SMEs: may not perceive the PM as a colleague who can convince them to take a particular action. The issue must still be positioned in a way that the ultimate decision ultimately rests with them. [O]

5.12.2 Attitude

Several activities were identified within Beta to describe the disposition of individual members or factors that affect them.

i. Sit down with SMEs: show them the relationship between instructional design, processes and their teaching and learning goals. This engagement, an authentic demonstration of our intentions. [Pr]

ii. Uncooperative SMEs affects course development and quality. [E]

iii. 'Need to be able to see beyond the language of project management.' [O]

iv. ‘There are some personalities that cannot able to work together.’ Some personalities will not trust or join into your project, you know, if there is something that has a campus-wide implication. [O]

5.12.3 Commitment

i. Organization found difficulty in making project expectations: commitment was made to resources and skills development. [P]

ii. Deans, sponsors, subject-matter experts must own process (budget implications, staff involvement), otherwise can disavow. [Pr]

iii. Accountability must be integral to governance. [Pt]

iv. Unit acceptance has had to balance the 'academic path' with process management. [Pt]

v. Tensions exist at the organizational level with perception that ‘from the top down’ a new business management approach exists and forces commitments. [O]

vi. ‘The objective of the new role and new project management methodology has been perceived as primarily administrative.’ [O]

5.12.4 Credibility

In managing e-Learning projects, working with teams, individuals or organizational elements that demonstrate their believability and trustworthiness contribute to an ongoing trust and credibility throughout those relationships. Various factors can contribute to this.

i. The Unit bridges tension between pedagogy and project management processes. [E]

ii. Reputation of trustworthiness (built on reputation, work commitments) contributes to potential goodwill. [E]

iii. Demonstration of double competency of instructional design and project management. [E]

iv. Expectations for creativity from OLT are met in unanticipated, untraditional ways. [E]

5.12.5 Motivation

Despite tensions and challenges, two key representative groups (instructional designers, subject-matter experts) identified valuable motivators that enabled their involvement. 'Processes' were not identified to have a role here. Informal, spontaneous actions (hallway conversations, meeting extensions, information sharing) satisfy unpredictable SMEs queries.

i. Demonstrations of online environment help to understand components, increase comfort prior to content development. [Pr]

ii. Motivation technique: retreats, roundtable sessions, remind values of e-Learning, education, higher education institutions. [Pr]

iii. The direction provided by department management encourages staff. [E]

iv. Subject-matter experts are passionate about the e-Learning project or multimedia design: they are self-motivated find new ways to relate to students. [E]

v. Encouragement: helping them to see the connections. [E]

vi. Stakeholders who push students in other ways will dramatically affect their motivation. [E]

vii. SMEs are already motivated if given release time by their department. [E]

viii. Course developer motivated (but they need to be nurtured): they understand environment, colleagues' needs and technology. [Pt]

ix. It is ephemeral: born out of bringing people back to the values and discussing those values regularly (not just at the beginning of the project). [O]

5.12.6 Negotiation

Only one process presented itself as a potential focus of negotiation—that being the preparation of agreements, budgets and memoranda. Beyond this, many enablers were identified to support this process as well as other elements of the project management activities.

i. Negotiation steps for project: letters and samples of agreements; define principles; budgets; MOUs. [P]

ii. Unsuccessful negotiation will diminish project trust. [E]

iii. Negotiation helps relationship building: how to work together, identify and solve problems in a mutually acceptable environment. [E]

iv. Negotiation is a recurring theme: need to have agreed upon goals reflecting the organizational context. [E]

v. Trusted conversations facilitate that process amongst team members and, by extension, with customers. [E]

vi. Project manager does not hold all of the goals: they must be distributed and negotiated back out to the project stakeholders. [E]

vii. The project manager should reflect and assess: do I have negotiation skills? Can I communicate, problem solve, brainstorm, adjusting issues that have nothing to do with process? [E]

5.12.7 Nurture

The difference between 'nurture' and 'acceptance' is the idea of protection. A few respondents voiced this idea (not distinguishing it from Alpha per se) in order to specifically underscore the importance of team members and maintain the institutional memory they possess.

i. Considering professional development advancement, understanding your career pathways (they attract good people to the organization: feel nurtured). [E]

ii. 'Yes, there's a nurturing piece. Leadership, teamwork, all of these have a people side that need to be addressed to avoid people leaving—which does happen.' [O]

5.12.8 Trust

At both Alpha and Beta sites, trust is seen as an enabler rather than a result. Different factors contribute. Those specific to Beta are listed below.

i. Working with SMEs through the e-Learning and curriculum development projects requires the careful tracking of activities to reinforce the placement of trust in both parties. [P]

ii. The role of the e-Learning project management team is (in part) to provide tools to clients for their own empowerment. One of the best ways is to 'go talk to them, build a relationship…a relationship of trust.' [P]

iii. Trust can be undermined when PMs try to 'force the hand' of SMEs. [Pr]

iv. Trust can result from showing stakeholder benefits of process-centric model. [Pr]

v. Trust is gained because of combination of pedagogical and project management skills, knowledge. [E]

vi. Loyalty reinforces trust among team relationships and can reflect the underlying values of the organization. When compatibility does not exist, loyalty can still occur—but so will tension. [E]

vii. Everyone at Beta is capable of two jobs: contributes to trust amongst team members. [E]

viii. Building a relationship based on trust is critical in the provision of tools to SMEs and others new to the use of project management capabilities. [E]

ix. Trust is critical with resistant subject-matter experts—their priority is T&L. [E]

x. Strongly advocating our approach to project management is useful to point – but academic decisions will always trump the project management perspective. [O]

xi. 'Without trust, you have a helluva project on your hands.' [O]

xii. 'There's an element of knowing each other, trusting each other, knowing how each other works, and the best way to approach each other that lays the foundation for negotiation.' [O]

xiii. Working with SMEs on this project type requires careful tracking to reinforce trust. [Pr]

a. ‘Or the best way to do that is to go and talk to them, to involve them, to build a relationship with them and the relationship of trust. And so what that is, that is the overall objective. And we have tools that we use that help us with that.’ [O]

xiv. ‘Trust is best expressed after something is completed, not in anticipation of completion.’ [O]

5.13 Adaptable variants

5.13.1 Academic freedom

The Beta and Alpha sites share many key factors—one of them is academic freedom. Beyond the policy, however, its influence can be a function of individual interpretations of the policy, willingness to follow its spirit or letter and the willingness of Unit staff to respect long-held teaching methods.

i. Academic freedom identified in collective agreement. [P]

ii. e-Learning projects force SMEs to revisit their curriculum development efforts; the new process requires them to think ahead to accommodate a new design element (and under someone else's direction). [P]

iii. Intellectual property affects online activities more than face-to-face: tangible nature of digital media. [E]

iv. ‘Every course is a personal expression of a SME's approach to teaching and learning. We have not tried to template that.’ [O]

v. ‘An academic will resist attempts to control them. Sometimes they have to be managed so that they do not even know they are following a process.’ [O]

vi. ‘Managing these projects often involves managing personalities who are long into an academic career. How do you apply a process to that?’ [O]

vii. ‘Strongly advocating project management is useful to point—academic decisions will always trump the PM perspective.’ [O]

5.13.2 Advisory committee

The Advisory Committee consists of interested parties named on initial application as collaborators but who have no direct daily involvement in the project.

i. Approve projects but allowed self-management. [P]

ii. Change typically happens in first half and reported back to advisory committee. [P]

iii. Roles: potentially review content or project ideas, review the budget, and maintain project oversight throughout the life of the project. [P]

5.13.3 Culture and values

Both Alpha and Beta posited that ‘project management’ (as a new management option) had connotations and values associated with it that were somehow in contradiction to or could eclipse the importance of those historically associated with a university.

i. Considerable process devoted to ‘exploration phase’ for the client; leads to creativity; build from scratch; client interaction. [Pr]

ii. Questions if PM is a suitable 'value' for an HEI environment: learning is the priority, not the project. [O]

iii. ‘The university is not a business. Promoting PM offends some.’ [O]

iv. Conversations about PM ‘are not going to get us anywhere on a curriculum project…that’s where you’ll be seen as taking it to the business side of the university.’ [O]

v. University values must be understood: in their absence quality will suffer (if the focus is on strict adherence to processes). [Pt]

vi. ‘PM comes from industry, different culture with different language, epistemology – adopting it to a university environment is challenging.’ [O]

vii. History as a unit of taking on too much in order to ‘prove yourself to the university.’ Absence of prioritization. Culture of not being able to say no. [O]

viii. ‘Project management historically comes out of engineering disciplines, which is a techno-centric view of the world. As you move across the spectrum over into socio-cultural, you have to start shifting the way you do things in a higher education setting because SMEs will not respond…It requires way more communication and coaching.’ [O]

ix. ‘It's an assumption that SMEs members think that project management belongs in a research and teaching institution.’ [O]

x. ‘Competitive nature of environment (created by funding models) can cause people to feel their work has been stolen by others. Attitudes change.’ [O]

5.13.4 Creativity

Senior management repeated the idea that academics work according to the long held traditions and practices of face-to-face teaching. While online teaching does require an adjustment to teaching methods, the underlying creative impulses remain constant. The only challenge is the need to convince SMEs. Having said this, Beta staff voice one curious observation – that union staff were somehow limited in how they could contribute to the creative dimensions of eLearning projects.

i. Use of ‘learning circles’ help manage (meet) expectations and try to meet deadlines. [Pr]

ii. In order to appreciate the potential assistance of the project management organization (the unit) and its processes, we need to ‘excite them to creativity…and to dig into the project of teaching and learning.’ [E]

iii. Independent, creative craftsmanship on the part of inspired intellectuals is a practice carried from medieval times. Trying to persuade those who have long-term independence, privilege and control into considering scope and milestones is quite awkward. [O]

iv. ‘Creativity is best handled by non-union staff.’ [E]

v. ‘'Shoehorning' a SME to prepare content to meet the demands of a strict development process is unsuitable.’ [O]

vi. ‘Creativity competency is something that can’t be trained….You either have it or you don’t…..You might have some. You might be able to train to a certain level.’ [O]

vii. ‘Process limitations will impede the creative elements of project progress.’ [O]

5.13.5 Expertise and competency

Project management skills are an important addition to the Beta environment, but only insofar as they can support the critical instructional design expertise.

i. ‘New staff must have a mixture in fields that are outside of project management, especially in terms of educational design, educational theory or just teaching.’ [O]

    a. This helps people to apply project management to a specific context but to develop a process from the context that suits the culture of that institution or at least addresses some of the cultural pressures within that institution. [Pt]

ii. A struggle exists for subject-matter experts insofar as their way of thinking must change. [Pt]

iii. Best hire: someone who has a mixture of skills and experience in project management, educational theory. [Pt]

iv. ‘The perception amongst instructional designers for organized processes is mixed: some consider them beneficial, while others consider them an imposition.’ [O]

v. ‘This organization was having significant trouble delivering projects so we made a significant investment in [inaudible] up our skills and bringing in some formal project management methodology that was basically based on [inaudible] and our ability to deliver projects increased quite significantly.’ [O]

5.13.6 Interface with organization

The Beta Unit is a central organization within the university and provides support to SMEs on technology use. The Unit cannot push its own agenda but can encourage them to see the value proposition in working with it. Various processes, practices and enablers are involved.

i. Each SME has local instructional support units for their discipline area. [P]

ii. Prioritization and approval scheme developed to rank projects on various factors. Resulted in a 'demand management' process stream. [P]

    a. It showed how easily PMs could overly commit themselves. [O]

iii. The competitive culture in this environment (created by funding models) occasionally causes people to feel their work has been stolen by others. [Pt]

iv. The university is a very decentralized institution draws on departmental leadership and needs to be collaborative. [E]

v. External parties make negotiation trickier with their own agendas. [E]

vi. 'Project management processes will discourage SMEs. Their interest is in creative T&L.' [O]

5.13.7 Lacking resources

i. Union regulations dictate that staff cannot be used to compensate for backfill of work. (Contractors would be needed: any other approach would be a break with union regulations.) [P]

ii. Resource assignments: identified, prioritized and approved. [P]

iii. Lack of resources discourage SMEs; told to work on e-Learning projects 'off side of desks.' [O]

iv. Meeting project expectations is difficult, so commitments must be made to acquire skills and resources in certain central units. [E]

v. Increased resources come from heightened interest for new processes and tools minimize solo behavior. [E]

5.13.8 Leadership and governance

Beta respondents described their leadership in more collaborative terms, with a greater 'hands-on' involvement in the day-to-day activities of managing projects (subject to independent project demands). Specific processes were identified concerning governance requirements (unlike Alpha site).

i. Management / leadership typically review process and determined its community governance model. [P]

ii. Agreement is needed on governance level before project is started. Typically, the first information requested [by leadership] is the due date, never the scope, never the budget. [P]

iii. Typically among the other leaders around the table it is pulled together, the problem is identified, and somebody takes it on. [Pr]

iv. Must draw on departmental leadership (which affects how PM processes occur). [Pr]

v. Managers / leaders need to 'walk the talk' by having (and demonstrating) skills of their subordinates as well as their own. [Pr]

vi. Increasing understanding of combined value of PM and pedagogical expertise needs a diplomatic touch. [Pr]

vii. 'If a team sees change in leadership—someone they can trust—they are empowered. Having said that, trust is not something you'll see written down as a process.' [Pr]

viii. Team has obligation to demonstrate mid-management leadership upwards to director and vice-president's office (e.g. concerning resources). [E]

ix. Leadership affects the team's perception of how projects are managed. A change can empower or discourage members. [E]

x. Leadership can be shared amongst 2-3 people. Problematic when there is an absence or the dynamic shifts--then certain elements of the project can be in jeopardy. [Pt]

xi. Senior leaders tend to expect quick project turnaround ('want the monkey off their back'). [O]

5.13.9 Intersection between pedagogy and information technology

The application of pedagogical principles within a classroom have been tested for centuries, and are relied on to this day. Introducing information technology represents a paradigm shift for SMEs to grapple with, particularly when new pedagogical principles accompany it. The view offered at Beta (mostly by senior team members) in meeting this challenge was to ensure these new projects were unfailingly and authentically set in an academic context, supported by the broad values of the institution and the specific interests of the relevant SMEs or department. Project management, in this environment, provides some processes to help navigate the new pedagogical / information technology intersection but does not dominate the scene.

i. The instructional designers are responsible for working with the learning community to see how technologies integrate (or not) into the environment. [P]

ii. Characterize course development as high or low maintenance. [P]

iii. We are providing consultation, support for the processes we put in place, but still must leave the ultimate decision with the SMEs member and academic department. [Pr]

iv. Safer to reengineer in an instructional context: remain rooted in pedagogy and consider technology. [Pr]

v. 'We make a start and but then address how the decision making process must reflect project management as well as the principles of instructional design.' [Pr]

vi. Make the development of online course authentic and meaningful in the context of the things that you are trying to achieve as an SME, researcher. [E]

vii. Tension: 'Why do we have to go through this PM process?' Leverage conversation around teaching and learning. [Pt]

viii. Professionals in higher education environments need to be educated about the idea of what a team 'could bring to the table in the context of learning design and development.' [O]

a. Increasing the understanding of the combined value of the project management and pedagogical expertise often needs a diplomatic touch to build trust. [O]

ix. 'A conversation on PM is not going to get us anywhere in a curriculum project.' (Project management will be perceived from the business side of the university.) [O]

x. 'Processes can't be seen as self-referential, must be externally-driven.' [O]

xi. 'Processes might benefit individuals within specific organizational elements who see clear indication of pedagogical principles.' [O]

5.13.10 Instructional designer/project manager

In both cases, Alpha and Beta instructional designers had a dual role as project managers—specific factors that influenced them differ as the following list demonstrates.

i. Liaison between writing and coding teams. [P]

ii. Liaison with outside partners as well as course developers. [P]

iii. Don't necessarily have 'intimate details of what it is we are working on at any given time.' [Pt]

iv. If the project priority has shifted—technical team coordinator is contacted and negotiated with. [Pr]

v. Negotiate critical timelines without team pressure. [P]

vi. Learning design focus: breaking down goals and supportive design activities (and how the learner might interact with those online). [Pr]

vii. PM needs to be aware of shifts, initiate contact with responsible parties to negotiate way forward. [Pr]

viii. An indication of a bad PM is when suitable project(s) need to be found for them. [O]

ix. Role can change away from PM to training or working with course developers to help them design a learning environment. [Pr]

x. Gentle pressures to team members who miss deadlines or avoid work. [Pr]

xi. Must distinguish and apply different management styles to union and non-union. [Pr]

xii. SMEs may not perceive a PM as a colleague; influence of the PM is thereby limited. [E]

xiii. Negotiations tricky with external partners: own particular unique needs, and ways of managing their content. [Pr]

xiv. Must build in flexibility at the outset of the project to make needed shifts and adjustments. [Pt]

xv. Flexibility is essential with external partners. [Pt]

5.13.11 Relationship-building

Relationship building can be a precondition for effective management of eLearning projects and/or a result of it (for future initiatives). Beta respondents noted its importance.

i. Negotiation supports relationship building: how to work, solve problems (free of blame), working towards the common goal. [E]

ii. Value propositions will also differ according to each SMEs and the particular elements we bring. [E]

iii. Leadership can facilitate relationship-building, thereby increasing trust. [E]

iv. Work with multiple faculties: agendas will differ, emphasizing importance of serving unique goals. [Pr]

v. A failed project can come from little or no interaction. [Pt]

5.13.12 SMEs and departmental staff

i. SMEs stall projects through lack of communication, intermittent involvement. [E]

ii. A culture of competition is created amongst SMEs due to the nature of our funding models. [E]

iii. Unit serves as a community practice facilitator: creates the learning environment for SMEs, especially around community practice. [Pt]

iv. Long in academic careers: defined personalities; badgering them with processes will not work. [Pt]

v. 'IDs/PMs may not be perceived as a colleague: at best it's an assumption that the person (or process) will be accepted by SMEs.' [O]

vi. 'There are some personalities that aren't able to work together…There are some personalities that will not trust or join into your project, you know, if there's something that has a campus-wide implication. They will put up roadblocks because of this past experience.' [O]

vii. 'Don't see themselves as collaborators.' [O]

5.13.13 Support

i. 'Managers are better if they are in the trenches. We are in project development and delivery—we actually have the eyes to see what's working or not.' [O]

ii. 'Don't forget the 'human element,' those project elements that can be forgotten by senior management.' [O]

iii. Encouragement, laying out the process, identifying relationships. [Pr]

iv. Need to know how the system works: how to use Web log; ensure comfort in that environment. [Pr]

v. 'Might mean a more of an intense focus at the beginning of a project with new developers.' [O]

5.13.14 Team members: roles and responsibilities

The following summarizes respondents data concerning specific team members.

i. Technical team: analyze components may be required for the project. [P]

   a. Two roles: strategic development and hands on (script writing). [Pt]

   b. Usually a partnership between a course developer with a staff member. [Pt]

ii. Learning technology specialist [P]

   a. Examines different technologies and how SMEs use them. [Pt]

   b. Design, so we've got front end and back end designers in that group.[Pt]

iii. Potential reviewers of content or project ideas, review the budget, and maintain project oversight throughout the life of the project. [Pr]

iv. Another element: a SME who first conceived for the project, managing the project dealing with the allocation of funds. [Pt]

v. Course developers: will be part of project team in developing content. [E]

   a. They may be a part of the technical team; possibly involved up from level of planning and evaluation. [O]

   b. They are not coming in jaded, with an agenda to acquire certain skills. [O]

   c. They are learning what it is to be involved in the project how to manage it, how to negotiate their time, how to feel confident enough sitting around a table with a bunch of experts to put their ideas forward (nurturing, mentorship). [O]

vi. 'Role of team to provide tools to clients for their own empowerment. Talk with them, build a relationship.' [O]

5.13.15 Teamwork

Beta respondents identified several practices in support of their team's project management activities.

i. Unexpected events are initially responded to unfavorably, but then constructively with the wider group to address potential project outcomes, or delays in project timeline. [Pr]

ii. The team needs to reflect the unique needs of a course, the students or the SMEs—a template cannot be applied to this. [Pr]

iii. Everyone is capable of 2 jobs, contributes to mutual respect and teamwork.[Pr]

iv. Retreats and other exercises tighten team attitude, values. [Pr]

v. Teams must anticipate (and be prepared to address) the participation of both cooperative and uncooperative SMEs. [Pr]

vi. Meetings must occur between technical team, instructional designer and subject-matter expert – but in such a way that not too much pressure is being put on the project team. [Pr]

vii. PMs have obligation to support course developers as they learn how to be involved in project: maintain time, maintain confidence with SMEs. [Pr]

viii. Personal connection within teams facilitates trust building and teamwork. [E]

ix. Business values need to be shared. [Pt]

x. 'Small groups examine reasons for problems and then involves whole team to address project impact.' [O]

5.13.16 Tools

Respondents made clear the idea that both instructional design and project management were the essential skills driving e-Learning projects. Supporting the application of these skills are multiple tools of different types from various organizational sources.

i. Resources and tools: a planning document, copyright clearance (in parallel), framework agreement with sponsoring unit or department. [E]

ii. Online documents ('clouds'). [E]

iii. Database: shared documents, file servers. [E]

    a. It is a bit of a challenge for creative technology types. 'When you want to encourage experimentation, you have to be careful not to put too rich a process around exploring new opportunities.' [Pt]

iv. Checklist of needed activities, project management assignments, minutes, monthly reports, and startup document. [E]

v. Startup document: shared with whole team, identifies SMEs, IDs, programmers, timelines. [E]

vi. Project proposal template that needs to be completed: scopes, scales, budget timelines defined, project sponsors, project manager, classification of the project (which will contribute to priority assessment). [E]

vii. 'People want to track writing projects differently and so I want to make sure that the developers have access to the information that they need…But I know that people individually might track things a little bit differently.' [E]

viii. 'Every course is a personal expression of a SME's approach to teaching and their assumptions about teaching and learning: we have not tried to template that.' [O]

5.13.17 Training

i. IDs in this environment have elements of formal project management training. [Pt]

ii. Training around issue management, proper change control, change management. [Pt]

iii. Touched on communications planning and communications management. [Pt]

iv. ‘And it’s still a point where people are still learning how and why they need to do this.’ [O]

5.13.18 Union / labour relations

The presence and influence of unions in the Beta Unit was unexpected. Job descriptions determine job performance and, consequently, managerial expectations. Limitations made by union workers concerning their willingness to participate in project affect both daily schedules and creative input. It must be clear, however, that unions are not designed to affect projects but rather the staff who work on them. Every function, service or capability within Beta is affected.

Management must be keenly aware of each person’s role and consider their decisions and expectations accordingly. However, advantages were found by certain managers: if some staff have clear structure to their job, give them work that can fit in that structure. Many elements of an e-Learning project fit this description.

i. Job descriptions dictate team member involvement. [P]

ii. Obliged to submit requisition to avoid breaking union agreement. [P]

    a. ‘Will get in trouble because we are taking away a job from a unionized person.’ [O]

iii. Union staff can be motivated by having their sense of fairness protected. [Pr]

iv. In some circumstances, the rigidity of the union working principles can be helpful to address the rigidity of some project tasks. [Pr]

v. Few union staff: want job protection, respect and fair treatment. Will work structured hours: jobs assigned on that basis. [O]

vi. ‘As a production manager, I know where we could use them to the best advantage for what we need to get done.’ [O]

vii. Back log of work is supported by contractors, not union staff.

    a. ‘We would have to hire outside, subcontract out some of the work, and be very careful that it doesn’t step over a union person’s job.’ [O]

viii. Attitudes of union and non-union staff are different. [O]

a. Using different project management techniques can help—in other words, manage expectations and positive attitudes. [Pr]

5.14 Synthesis of data: Beta site

The following meta-matrices present the processes, practices, enablers, observations and properties distilled from the Beta site data. To remain consistent with the approach taken with the Alpha site, factors are associated with individual team members.

5.14.1 Factors: sponsor

The Beta sponsor has much greater influence over the management of e-Learning projects, but without direct involvement. Responsible for specific processes at a more executive level, the Sponsor negotiates agreements, participates in the advisory committees, and program governance (see Table 5-13).

Advocacy is also a critical element to the Beta Sponsor role—and unlike the Alpha site which seemed to focus on labour relations—the Beta sponsor was quick and clear to promote educational values as a key priority that affected their management duties. (This is not to say that the Alpha site did not, but this message was clearer at the Beta site.) In the words of this respondent, 'I question if project management is a suitable value for a higher education environment. Learning is the priority.'

Table 5-13: Beta site: partial meta-matrix - sponsor factors (Pasian, for this research)

Processes	Practices	Enablers	Properties
Negotiates MOUs, letters of agreement, budgets for individual projects (with PMO). Manages PMO, secures project approvals (from faculties, schools). Observes collective agreement (for academic freedom). Determines community governance model. Participates in Advisory Committee (no direct daily involvement).	Leadership pressure to deliver something quickly. Project management focuses on short-term delivery processes. Work with multiple faculties: agendas will differ, emphasizing importance of serving unique goals (but joint ownership).	Management direction encourages staff. Value propositions differ according to each SMEs and the particular elements we bring.	Deans, Sponsors must own process (budget implications, staff involvement), otherwise can disavow.

5.14.2 Factors: manager, project management office

In a similar fashion to the Project Sponsor, the Manager of the Project Management Office had a greater influence over the actual management of projects without being 'hands-on.' On the basis of established processes, this Manager was directly responsible for priority setting, resource allocation, executive-level reporting and negotiation (see Tables 5-14 and 5-15).

Of particular importance within this role was the clear advocacy for the learning principles and educational values at the core of the Unit's (and university's) responsibilities—a role not outlined within the processes associated with the project management capability. This priority was top-of-mind for the Manager and a direct influence over a range of activities including staff hires, SMEs cooperation and departmental interaction.

Table 5-14: Beta site: partial meta-matrix - PMO factors (Pasian, for this research)

Processes	Practices
Gathers requirements to conduct needs assessment. Distribute, manage goals amongst project stakeholders. Creates meaningful feedback points. Manage integration of new projects (especially with missed deadlines). Facilitates provision of tools for e-Learning project management teams. Develops prioritization and approval scheme to rank projects. Identifies, prioritizes, approves resource assignments. Reports upwards to senior management. Negotiations with external partners. Explicit approvals necessary to avoid disorganized management / development of courses.	Careful tracking of activities to reinforce the placement of trust in both parties. Motivation technique: retreats, roundtable sessions, remind values of e-Learning, education, HEIs. Hiring: new staff must have a mixture in fields outside of PM.

Table 5-15: Beta site: partial meta-matrix - PMO factors (Pasian, for this research)

Enablers	Properties
New resources open up to support creative space for them. Needs assessment: can generalize certain aspects to accommodate different contexts. Unsuccessful negotiation will diminish project trust. Intellectual property affects online activities more than f2f: tangible nature of digital media. Leadership can facilitate relationship-building, thereby increasing trust.	Various scheduling activities reflect project demands and broader university demands. Accountability must be integral to governance. Unit acceptance has had to balance the 'academic path' with process management. Leadership can be shared amongst 2-3 people. Problematic when there is an absence or the dynamic shifts--then certain elements of the project can be in jeopardy. University values must be understood: in their absence quality will suffer (if the focus is on strict adherence to processes).

5.14.3 Factors: production manager

The most significant difference between the site teams was the Production Manager role—a position serving as an intermediary between the Manager of the Project Management Office and the instructional designers. The responsibilities revolve around key ADDIE phases, beginning with an analysis of the project (referred to as the 'exploration phase'), and continuing with design and development processes (see Tables 5-16 and 5-17).

Of particular importance with this role is the use of informal and unplanned practices to support stakeholders. Management, SMEs, and course developers all provide unexpected demands to which the Production Manager responds with varied management techniques.

Table 5-16: Beta site: partial meta-matrix - production manager factors (Pasian, for this research)

Processes	Practices
"Exploration process": lead identified; exploration of client's goals, logical needs. Moves into the creative endeavor (search or build from scratch). Initial project design: preparation of documents for tracking milestones (from a curriculum development, resources). Identify, manage risks, budget, schedule. Cycle between evaluation and delivery: whatever comes back from a focus group will go back to delivery cycle (before launch). Union regulations dictate that staff cannot be used to compensate for backfill of work. (Contractors would be needed: any other approach would be a break with union regulations.)	There are some assumptions at the beginning concerning design space, the environment and tools. Using different project management techniques can help --- in other words, manage expectations and positive attitudes. Evaluation can focus on tools to support professional development side of team members (in addition to individual courses). "Priorities of the day job" are balanced by the client against the project demands. Typically the 'day job' comes out on top. Managers / leaders need to "walk the talk" by having (and demonstrating) skills of their subordinates as well as their own. Unexpected events are initially responded to unfavorably, but then constructively with the wider group to address potential project outcomes, or delays in project timeline. Union staff can be motivated by having their sense of fairness protected. In some circumstances, the rigidity of the union working principles can be helpful to address the rigidity of some project tasks.

The Production Manager also advocates team members' seamless transition between occupations. Being able to perform as an instructional designer or project manager when the situation demands is a key behavioural trait of this respondent.

Table 5-17: Beta site: partial meta-matrix - production manager factors (Pasian, for this research)

Enablers	Properties
Everyone at Beta is capable of two jobs: contributes to trust amongst team members. Personal connection within teams facilitates trust building and teamwork. Online documents ("clouds"); Database: shared documents, file servers; checklists of needed activities. Limitations of course contract funding dictates scope of evaluation.	It is a two-year window: when we get a project starting from development (January, May, September). Length of time of course development will vary depending on how prepared that client is with the biggest problem. A failed project can come from little or no interaction. Attitudes of union and non-union staff are different.

5.14.4 Factors: instructional designer / project manager

Beta site instructional designers have an identical role to their Alpha counterparts but, with the involvement of the Production Manager adding a greater degree of accountability (compared to the Alpha site), their autonomy was somewhat diminished. Regular reporting sessions to address content development, design, scheduling and other project issues had the net effect of sharing management responsibilities and decision-making between the individual ID and the Production Manager. Interaction with SMEs was, in a similar fashion to the Alpha site, characterized by sensitive negotiation and creative development sessions (see Tables 5-18 and 5-19).

Table 5-18: Beta site: partial meta-matrix – ID/PM factors (Pasian, for this research)

Processes	Practices
Reporting: pulling a team together, calling meetings, identifying the objectives to associate them with evaluation and outcome. Weekly reporting to discuss week's accomplishments, plans for following week. Liaison between writing and coding teams. Liaison with outside partners as well as course developers. Negotiate critical timelines.	Sit down with SMEs: show them the relationship between instructional design, processes and their teaching and learning goals. This engagement, an authentic demonstration of our intentions. Missed content development deadlines forces changes in expectations for project. Motivation technique: retreats, roundtable sessions, remind values of e-Learning, education, HEIs. The team needs to reflect the unique needs of a course, the students or the SMEs—a template cannot be applied to this. Teams must anticipate (and be prepared to address) the participation of both cooperative and uncooperative SMEs. Learning design focus: breaking down goals and supportive design activities (and how the learner might interact with those online). PM needs to be aware of shifts, initiate contact with responsible parties to negotiate way forward. Role can change away from PM to training or working with course developers to help them design a learning environment. Must distinguish and apply different management styles to union and non-union. Use of "learning circles" help manage (meet) expectations and try to meet deadlines.

Table 5-19: Beta site: partial meta-matrix – ID/PM (Pasian, for this research)

Enablers	Properties
Design process associated with distance education courses directly supports online course development. "High level" design requires flexibility on outset of project structure to make shifts and adjustments as we need to. Trust can result from showing stakeholder benefits of process-centric model. Gentle pressures to team members who miss deadlines or avoid work.	Some project goals will continue to be emergent. Things will be learned via the process not known at the beginning. IDs in this environment have elements of formal project management training. An indication of a bad PM is when suitable project(s) need to be found for them.

5.14.5 Factors: subject matter expert

Also similar to their Alpha counterparts, the primary responsibility for Beta SMEs is content development. Culturally, however, there seemed to be a more significant degree of recalcitrance that was an ongoing source of frustration for project activities. So, despite the stated processes requiring their involvement, a number of informal practices are needed (often applied on individual SMEs) to keep them engaged (see Tables 5-20 and 5-21).

Table 5-20: Beta site: partial meta-matrix - SME factors (Pasian, for this research)

Processes	Practices
Participate in content development. Sign-off on new content.	SMEs leadership affects PM processes occur. Status meetings can evolve into coaching sessions: reinforce acceptance of project management. Lack of resources discourage SMEs; told to work on e-Learning projects "off side of desks." (Priorities can be missed.) SMEs may not perceive a PM as a colleague; influence of the PM is thereby limited. e-Learning projects force SMEs to revisit their curriculum develop efforts; the new process requires them to think ahead to accommodate a new design element (and under someone else's direction).

Table 5-21: Beta site: partial meta-matrix - SME factors (Pasian, for this research)

Enablers	Properties
Heightened interest for new processes & tools to minimize solo behavior results in increased funds. Local instructional support units for the discipline area to help SMEs. Lack of technology understanding dramatically affects SMEs approach. Trust empowers resistant subject-matter experts—their priority is T&L. Negotiation supports relationship building (how to work, solve problems without blame). Processes might benefit individuals within specific organizational elements who see clear indication of pedagogical principles. SMEs stall projects through lack of communication, intermittent involvement. Funding models create culture of competition.	Long in academic careers: defined personalities; badgering them with processes will not work. SM has little time for content; meeting deadlines almost impossible.

5.14.6 Factors: course developers

Again, as with their Alpha counterparts, a course developer's responsibilities to design, develop and evaluate digital media require their ongoing participation in the project team and frequent interaction with instructional designers and subject-matter experts (see Table 5-22).

Table 5-22: Beta site: partial meta-matrix - course developer factors (Pasian, for this research)

Processes	Practices	Enablers	Properties
Analyze technical components required for the project. Participate in design sessions; develop content. Respond to evaluation activities as necessary.	Meetings must occur between technical team, instructional designer and subject-matter expert – but in such a way that not too much pressure is being put on the project team. If the project priority shifts (if another project has come on board)--technical team coordinator is contacted and negotiated with.	Intentionally blank.	Comprised of technical team members, designers, learning technology specialists. Motivated (but they need to be nurtured): they understand environment, colleagues needs and technology.

5.14.7 Revised conceptual framework—Beta site

Based on the Beta site analysis, the following variations are made to the conceptual framework (Figure 5-9, noted in bold text). An analysis of the revised elements—based on a comparison with the Alpha site—will occur in Section 5-15. The revised conceptual framework will appear in Chapter 6.

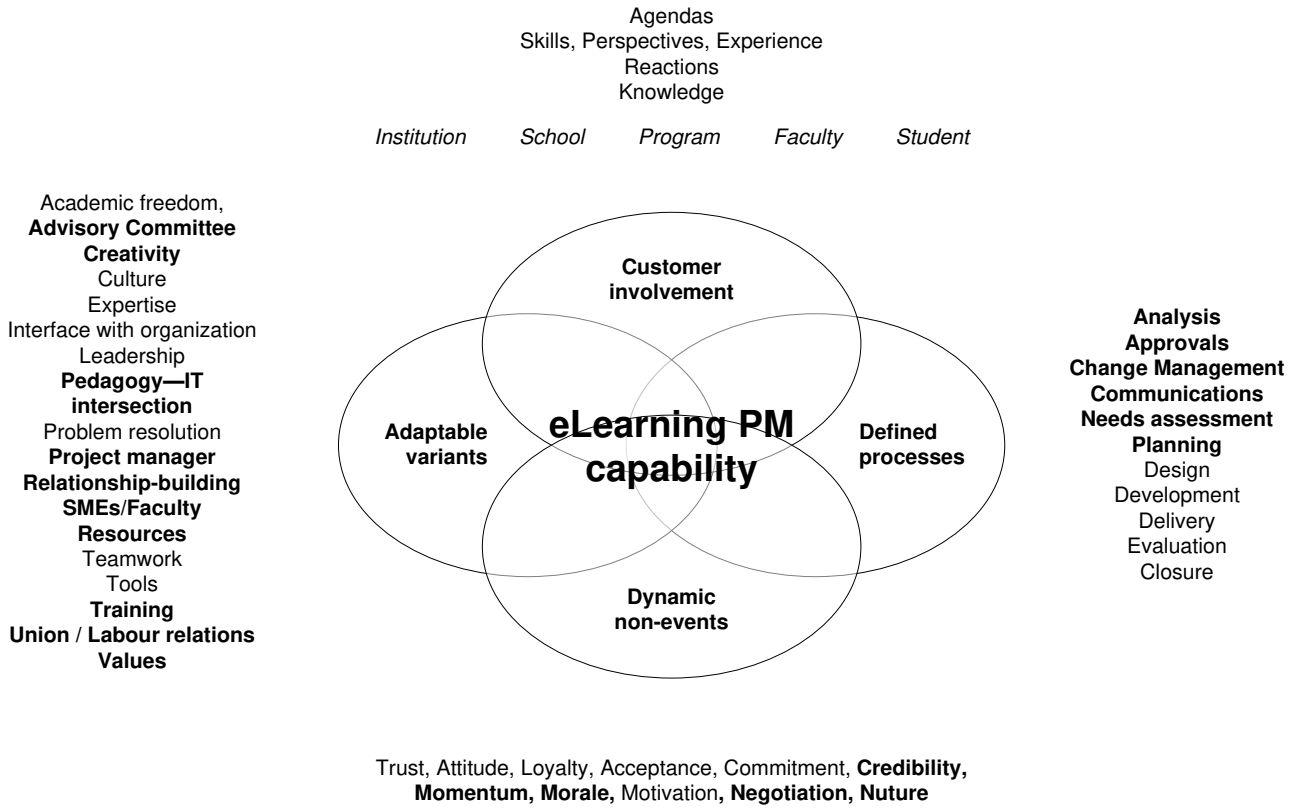

Figure 5-9: Revised conceptual framework—Beta only (Pasian, for this research)

5.15 Comparison of case sites

Table 5-23 lists the original, higher order nodes contained within the initial version of Conceptual Framework. The variations identified under the 'Alpha' and 'Beta' columns are the result of reconciling the collected data—and represent important departures to the original framework. Each will be explored below with references to the appropriate data points in Sections 5.3-5.8 (Alpha site) and 5.9-5.14 (Beta site). The revised conceptual framework is in Chapter 6 (Figure 6-2).

Table 5-23: Comparison of Alpha & Beta variations to original framework nodes (Pasian, for this research)

Original nodes	Alpha variations	Beta variations
Customer involvement: *Agendas, Experience, Knowledge, Perspectives, Reactions, Skills*	-No variation-	-No variation-
Defined processes: *Design, Development, Delivery, Evaluation, Closure*	PM-Initiation PM-Planning PM-Execution PM-Closure	Analysis, Approvals, Change management, Communications & Reporting, Needs assessment, Planning
Dynamic non-events: *Acceptance, Attitude, Commitment, Loyalty, Motivation, Trust*	Momentum , Morale	Credibility, Morale, Negotiation, Nurture
Adaptable Variants: *Academic freedom, Culture, Expertise, Interface with organization, Problem resolution, Leadership, Teamwork (various roles)*	Creativity, Funding, Intellectual property, Instructional designer, (Interface with organization), (Problem resolution), Release time, Union / Labour relations	Advisory Committee, Creativity, Pedagogy—IT interaction, Project manager, Relationship-building, SMEs/Faculty, Resources, Tools, Training, Union / Labour relations, Values

5.15.1 Project types

Both sites identified three of the same project types: full online courses, hybrid courses (with multiple delivery modes), and single technology projects. Beta also identified distance education courses as project types (5.3.2 and 5.9.3).

5.15.2 Project teams

The makeup of the typical e-Learning project team was almost identical at each site with one exception – the presence of a production manager at Beta (5.3.3 and 5.9.2)

5.15.2.1 Comparison of team members

Project sponsors did not have 'hands on' responsibilities for projects at either site. To characterize the differences between each, one could consider the Alpha sponsor a support player who help enable project management activities while Beta sponsors were leaders at an executive level (Tables 5-5 and 5-13). While Alpha managers were not able to 'manage' staff, they did remain constant advocates of educational values – a role they had in common with their Beta counterparts.

Managers of project management offices also differed in the extent to which they could manage staff and directly manage projects. At Alpha, this presented a challenge where the Manager in question had authored the project management processes (for all staff to follow) but was unable to manage instructional designers through it (5.5.1.1 ii). Personal choices to informally facilitate communications helped to overcome this challenge (5.5.1.1 viii).

The Beta counterpart was more vocal about the Unit's responsibility in remaining advocates of educational values—dominating project management demands where appropriate (5.13.3 ii, iv). Every decision—staff hiring, project planning, project prioritizing, project implementation—was made through this framework. Such a framework may have also been in place at Alpha, but was not articulated as much by these respondents. The Beta manager was also much more involved at a tactical level in choosing and managing e-Learning projects, partly reinforced by their reliance—one could call it a partnership—with the Production Manager (see Tables 5-14 and 5-15).

The Production Manager was unique to the Beta site, serving in a senior role with managerial responsibility over instructional designers (see Table 5-16 and 5-17). All key project decisions—planning, design, development, budgeting, staffing, evaluation—were directed by this Manager.

A key personal decision made by the individual in this office (there was no evidence that this was required) was to encourage a policy of 'walking the talk' – ensuring that instructional designers (and the more senior Manager) could serve in multiple roles should circumstances demand it (5.13.8 v). This

contributed to the productivity of the environment. Alpha project managers did not indicate a similar choice or behavior.

At both sites, instructional designers served as project managers demonstrating their expertise in pedagogy and technology and, to a lesser extent, project management (see Tables 5-7, 5-8, 5-18 and 5-19). The processes for which they were responsible varied between sites (see Sections 5.6.6 and 5.13.10), as did the informal, spontaneous and creative practices they used to support them.

The role played by subject-matter experts was quite similar at both sites where each served as the primary content developer (see Tables 5-10, 5-20 and 5-21). The challenges presented by these team members were also similar in that their adherence to the principles of academic freedom (and associated institutional policies) made them reluctant participants. Securing release time (by their departmental administrators) helped in this regard by reassuring them they had departmental support. Their experience with technology, instructional design principles was uneven (again, a common trait between sites) as was their enthusiasm for using social media to engage their students. These inconsistencies were addressed by instructional designers who used informal, spontaneous and personal engagement to secure their involvement.

5.15.3 Customer involvement

5.15.3.1 Customer identification

Both Alpha and Beta sites identified school community (including senior management), individual SMEs, programs, departments and students as primary customers of e-Learning projects (5.4.1 and 5.10.1). The Beta site offered two additional customers: external clients (business owners who participated in continuing education studies), and the advisory committee associated with individual projects. All customer types are consistent with the definition of 'e-Learning customer' provided in Section 4.4.3.

5.15.3.2 Skills, perspectives and experiences

The information provided for this node was quite limited. Respondents spoke of these qualities as they pertain to students and the subject-matter experts. For 'students,' respondents summarily offered the following observations (5.4.2 and 5.10.2):

- The technical skills varied, along with their perspectives.
- Their different learning needs affected how the project should unfold, in particular its design, development and implementation.
- Students typically influence the projects with their enthusiasm, understanding of the student body and lacking cynicism. Their familiarity with social (digital) media and enthusiastic engagement with the online world provided them with levels of experience that made their reception of e-Learning projects more likely.

Because of the variations in technical skills amongst some of the team members, training was provided (at the Beta site (5.11.4 vii). Subject-matter experts were largely inexperienced with the technology in use. Additional instruction was occasionally provided (at both sites) to enhance their contribution to the design phase of the project.

5.15.3.3 Agendas

Respondents at both sites commented on the SMEs having agendas concerning e-Learning projects (5.4.3 and 5.10.3): they would always pursue their academic goals over the project management demands (including those specifically required by the Unit) associated with the project. For some, this did manifest in a desire to use social media to support their teaching and learning agendas but, again, with less consideration to project management processes.

Beta respondents further commented on the interests of external clients who had their own particular needs and project management approaches for e-Learning projects. This made collaboration with internal (Unit) staff problematic (5.10.3 iv). Alpha respondents did not comment on this issue.

5.15.3.4 Knowledge

Only the Beta site provided observations on the knowledge they perceived their customers to have (5.10.4). Course developers had more technical knowledge than they did about instructional design principles. The opposite was the case with SMEs. External clients understood their own business requirements, but were not technically astute and largely ignorant about instructional design principles (5.10.4 iii). It was unclear as to why the Alpha site had less information about the knowledge of its customers. Responses were not provided on this topic.

5.15.3.5 Reactions

Both sites limited their remarks to SMEs who, in both cases, were noted to have high anxiety levels with approaching these projects and frequently challenged the Unit and its members as the project unfolded (5.4.4 and 5.10.5). Specific resistance was noted at the Alpha site concerning the development of project proposals, and at the Beta site concerning the production process. In both cases, the anxiety was alleviated in part to the trust demonstrated at and emergent from one-on-one interaction between instructional designers and SMEs, and departmental staff and course developers (5.7.8, 5.12.2).

5.15.4 Defined processes

Both sites had defined processes to manage their e-Learning projects (5.5 and 5.11). Alpha developed and launched a 4-stage management process shortly before the data collection. Beta, on the other hand, was reliant on more established processes that, while specific to e-Learning projects, were partially informed by the long-standing distance education procedures.

5.15.4.1 Change management

Both sites had processes to accommodate changes and open up resources for support (5.7.3 i, 5.11.8).

5.15.4.2 Communications and reporting

Both sites had reporting responsibilities, but acted on them differently. The Alpha team members relied largely on informal communications activities within teams and in response to inquiries from the Manager of the Project Management Office (5.5.1.1 viii). The impact of labour regulations was felt here, which minimize formal management oversight and any formal communications activities that would normally accompany this (5.6.10 x).

The Beta site, on the other hand, specifically required instructional designers to participate in weekly meetings to provide updates that fed directly into the production calendar (5.11.9).

5.15.4.3 Design

In discussing design issues, Beta respondents placed considerable emphasis on pedagogy (5.13.9). One of the key initial steps identified was the creation of a ‘wire frame’ to indicate the form the online application might take (5.11.1 v; 5.11.4 iii). Project management issues were not emphasized within the

design stage. In the words of one respondent: ‘You need to be able to interpret the value of project management processes within a context that is broader than that which is defined by project management. The perspective, however, needs to be supported that everything could be invented within the project’ (5.11.4).

The Alpha site emphasized the project management processes associated with design and development in the Planning and Execution stages (as opposed to instructional design issues) (5.5.2 and 5.5.3). Pedagogy is a critical element to these projects, but not something given much attention in the Alpha interviews. Emphasis was placed more on the newly instituted project management phases and the role of the project manager in managing these phases.

Beta also indicated their reliance on their experience, infrastructure, and competencies associated with distance education (5.11.4 iv). The Alpha site made no reference to such legacy factors, but rather emphasized the new project management processes newly launched.

Both sites spoke of their challenges with Evaluation activities. Despite the stated requirements for evaluation (5.11.6), teams rarely conducted such activities as part of the closing phase of their projects. The strongest emphasis on Evaluation was offered by Beta respondents who noted the importance of the relationship between Evaluation and Delivery activities. To support these elements, customers were always involved, typically as part of focus groups.

5.15.4.4 Development

Both sites spoke of development issues, but Alpha respondents (again) focused on the new project management processes (with little emphasis on pedagogical issues). Beta respondents discussed their interactions with subject-matter experts and the challenges of developing content with stakeholders new to e-Learning (5.12.5 i,iv). References were again made to the use of ‘wire frames’ in the development processes (5.11.5 x), and the establishment of ‘meaningful feedback points’ (5.11.5 i) to facilitate continued discussion amongst the instructional designers, SMEs and course developers and minimize development delays.

5.15.4.5 Needs assessment

Again, this was a theme given special emphasis by Beta respondents (5.11.1). By contrast, it was an element incorporated in the Alpha Initiation stage, but not discussed at any length in interviews. At Beta,

needs assessment were part of 'an exploration phase' that allowed various stakeholders (technical/business analysts, subject-matter experts and instructional designers) to contribute.

5.15.4.6 Planning

Planning activities for both sites contained many similar elements (5.5.2 and 5.11.3). A key difference emergent from Beta respondents, however, concerned 'socializing' activities in support of the overall Planning effort (5.11.3 xv). Both sites use documentation that answers questions concerning project objectives, scope, stakeholder analysis, risk analysis, budget, evaluation activities, success measures and communications. An example (from the Beta site) is included as Appendix #4.

5.15.5 Dynamic non-events

There was universal support for the relevance and impact of this node and the specific elements listed. While 'trust' was the most dominant, each will be explored below.

5.15.5.1 Trust

Trust was a frequently mentioned or implied element of the project management capabilities at both sites (5.7.8; 5.12.8). It is a pervasive force enabling team members to work together and a factor leading project managers to engage (to varying degrees….depending on the extent of the 'trust') project management processes.

Respondents touched on its importance in facilitating project planning when faith in new processes was low. Others commented on its relationship to 'expertise,' where instructional designer and subject-matter experts are afforded a higher degree of trustworthiness and credibility based on their expertise. Comfort with and belief in leadership changes (positively or negatively) was also a function of trust (5.13.8 ix).

Teamwork was affected by low degrees of trust when project managers were chosen (or self-selected) based on factors unrelated to experience or competence (5.6.4 iv and 5.6.6 iv). As an enabler in relating to subject-matter experts, when personal attention was afforded these team members, their trust in the process increased (5.7.3 v). Beta respondents characterized this as 'relationship building' (5.13.11).

5.15.5.2 Attitude

Observations concerning 'attitude' indicated reluctance on the part of uncooperative SMEs (5.12.8 xiii) at both sites and the impact that a lack of recognition had on the project, the project manager, and project management practices in general. In the words of one respondent, 'one needs to be able to see beyond the language of project management to participate in these projects' (5.12.2 ii).

5.15.5.3 Commitment

Commitment to the project management processes and activities was a challenge indicated by many respondents at both sites (5.7.3 i, 5.12.3). Alpha staff were affected by union influences while the Beta unit constantly struggled to balance their commitment to educational values against those associated with project management..The importance of leadership commitment was a key factor, identified by Beta respondents as part of the nurturing of team members.

5.15.5.4 Morale

'Morale' was an addition to this category (5.7.5). Focusing on how team members cope emotionally or mentally in the face of managing e-Learning projects, a common observation addressed the stress felt by junior team members as part of the 'constant churning out of material.' A close connection is made between poor attitude and morale, particularly when professional development opportunities are denied for junior members (or those in unions not providing such opportunities). Demonstrating compassion was an observation made by Alpha instructional designers as part of their personal managerial choices and behaviours (5.6.9 ix).

5.15.5.5 Motivation

Keeping team members and stakeholders motivated was another 'non-event' identified by respondents—especially instructional designers in their capacity as project managers (as opposed to pedagogical advocates) (5.7.6 i; 5.12.5). A key difference between the sites was the impact of labour regulations on individual staff. By having limitations on their pay and professional development opportunities, motivation was a challenge for some.

5.15.6 Adaptable variants

5.15.6.1 Academic freedom

Academic freedom is a key value for SMEs within higher education, and one that significantly influences the project management capability at both sites (5.6.1; 5.13.1). In each case, SMEs are tremendously reluctant to give up their control over the content they develop, but organizational policies concerning digital media demand they relinquish it. Securing copyright over 'tangible content'—as opposed to that which is delivered in a classroom—is a necessary step for all e-Learning projects, but one that requires careful negotiation with subject-matter experts.

Academics often resist attempts to be controlled, generally believing that every course is a personal expression of their approach to teaching (5.13.1 iv). Others do not regard it as highly as others—but all are required to comply. Spontaneous and (often) informal practices are used to respect the educational values of academic SMEs while securing the propriety value of the digital media.

5.15.6.2 Culture

'Culture' is a manifestation of various specific factors that vary from site to site (5.6.3; 5.13.3). It was an undeniable factor affecting different components of the management of e-Learning projects. Alpha project teams were affected by a culture characterized by complacency (reinforced by partitioned Unit elements) and influenced by unions.

Respondents at both sites emphasized the critical importance of educational values, and how respect of those values permeated every aspect of the organization. As one Beta instructional designer noted, discussions about project management 'are not going to get us anywhere in curriculum projects…that's where you'll be seen as taking it to the business side of the university.' It is an assumption, noted at Beta, to believe that SMEs consider project management a suitable component of a research and teaching institution.

5.15.6.3 Creativity

Common to both sites (5.6.2, 5.13.4), the challenge was operationalizing imaginative, innovative efforts in the structure of a project management capability that was flexible from project to project. Subject-matter experts must adapt their face-to-face teaching strategies with online course designs that are new to

them but necessary for the course developers. An added dimension is the requirement to build a flexible platform with content that is adjustable for (and by) students in their role as customers. This expectation manifests in a changeable project scope that keeps the project undefined.

Instructional designers are the masters of this domain, using their specific expertise along with ingenuity and patience to capitalize on the collaborative content development sessions. The creative element to an e-Learning project is absolutely necessary enabler to its management and impossible to quantify.

5.15.6.4 Expertise amongst various team roles

Instructional design is one area of expertise common to both sites (5.6.4; 5.13.5). These professionals are at the centre of managing e-Learning projects, but their role differed between Alpha and Beta sites. At the former, project management expertise was limited, forcing project managers to self-select and use their personal experience (rather than professional training) to influence team management and, ultimately, project success.

Instructional designers at the Beta site also served as project managers but with the Production Manager in an overseeing role, their project management responsibilities were somewhat diminished and put them in the position of not knowing all project details at any given time.

Subject-matter experts also served as experts at both sites, but their expertise changed from individual to individual. This is a common trait in e-Learning projects.

Senior managers at both sites remarked on their hiring practices concerning instructional designers. The Alpha site preferred having an ID with a combination of these skills, and made attempts to train certain individuals. Management at Beta, however, made it clear that staff had to (primarily) have skills and experience in educational design and theory, and teaching. project management expertise was secondary. (5.13.5 i).

5.15.6.5 Interface with host organization

Both sites are central units within their organization, but the Beta unit had a greater base of influence and responsibility that allowed them to support different faculty and departments through local instructional support units (5.13.6). It does not push project management processes, but is vigilant about keeping the

focus on teaching and learning. Challenges surfaced through competition for funding, the need to access departmental leadership in a decentralized university and external parties with their own agendas.

Alpha's interactions were described more simply: separate agreements for digital production were negotiated by management along with release time for subject-matter experts (5.6.8 i, ii). Once agreements were decided, each project was directed through the 4-stage process (5.5).

5.15.6.6 Resources: provision and management

An issue common to both sites was the influence that the provision of funding had (or not, as the case may be) on relationships with subject-matter experts. Reassurance or discouragement was a direct function of the presence or absence of project funding (5.6.5 iii; 5.13.7 iii).

Alpha emphasized their dependence on resources, and the impact shortfalls had on project progress (5.6.5 iv, v). Beta also commented on the effect of low resources, and their strategies for dealing with same: contract workers had to be called in when union staff were at their temporal limits (5.13.7 i).

5.15.6.7 Tools

Beta respondents provided many details on the various tools they used in managing e-Learning projects. (Alpha did not make this a specific issue.) Planning and startup documents (an example of which is in Appendix #4), virtual meeting and storage spaces and individual training were examples (5.13.16).

5.15.6.8 Leadership and governance

The reality of leadership was quite different between sites. Alpha site had a management level that had responsibilities (largely) with interacting with departments and other central units. They could pressure the management of projects, and engage in creative brainstorming sessions, and provide informal support—but there was no defined managerial responsibilities. Management has no direct management role over projects. They could lead through informal communications efforts and provide general support but, at most, Unit leadership could best be described as uneven.

Leadership at the Beta site was quite strong and clear by comparison. Advisory committees are struck for projects (5.13.8). Agreements are made between unit management and other organizational department counterparts. When leaders sit at project management tables, problems are identified and shared to determine the best course of action.

It was clear at the Beta site that there was a management tier with responsibilities and influence, and a desire to act on them. Junior staff recognize these offices and worked accordingly. Leadership was more even, with distribution amongst several people.

Such practices were not identified or observed at the Alpha site. In fact, due to the specific job descriptions (determined by union regulations), such managerial flexibility was not possible.

5.15.6.9 Intersection between pedagogy and IT

Beta respondents were quite vocal about educational values being more important than the project management methods used to manage the associated projects. This emphasis influenced every aspect of its operations (5.13.9). Alpha respondents offered fewer details about this and chose to offer more details about process issues.

5.15.6.10 Labour relations: impact of unions

The presence and influence of unions at both sites was an unexpected development and was a significant addition to the conceptual framework (5.6.10; 5.13.18). While union representatives did not participate directly in project management activities, the effect of labour regulations was felt throughout. Team member selection and temporal commitments were the most clearly affected. Managerial involvement was also constrained on the basis of labour stipulations.

The culture of both sites also felt the impact of unions. Professional development opportunities were limited to certain union members, thereby decreasing the morale and motivation amongst course developers. Tensions would arise as a result of instructional designers not willing to manage teams in order to maintain 'a bizarre sense of loyalty' to non-union members.

Beta respondents—in particular the production manager—identified pragmatic solutions that would balance union member interests against the demands of managing the projects.

5.16 Conclusions

The research goal of the case studies (Project #2 in the multimethod research design) was to identify the processes, practices and enablers that contribute to an organization's management of undefined (e-Learning) projects. Using the conceptual framework identified in Chapter 4 and meta-analysis techniques offered by Miles and Huberman (1994), these details have been analyzed and offered through the

perspective of the project team members (see Figure 5-10). Emergent characteristics (which extend the original framework) are indicated in bold.

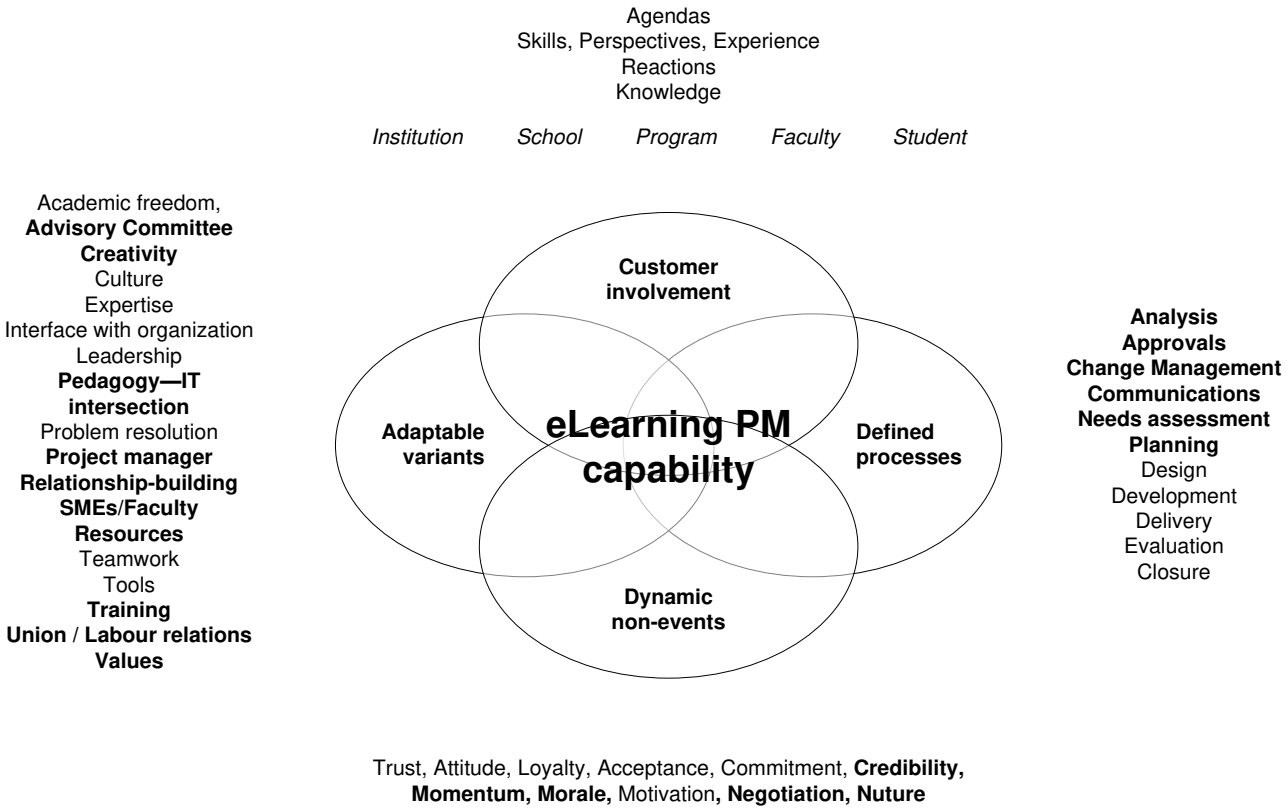

Figure 5-10: Revised CF with variations from both case sites (Pasian, for this research)

Moving on to Chapter 6, this analysis will serve as the basis for a discussion focusing on the research questions. Conclusions will be drawn, and the implications of this inquiry on theory, practice, methodology and further research will be examined.

Chapter 6
Discussion and Conclusions

6.1 Introduction

This thesis examined the project management capabilities at two university units responsible for implementing teaching and learning strategies. Both are responsible for managing e-Learning projects, and both are considered reliable.

Dominating project management maturity theory indicates that such reliability is accomplished through the use of defined, repeatable, predictable processes that are under strict control. Using a typical project management maturity model assessment, the absence of such control prevents the project management capability from increasing its reliability and, ultimately, remaining 'immature.' To be consistent with this logic, the management capability of an undefined project would remain immature because of the use of flexible, often unrepeatable processes and practices that would be used to achieve project (goal) definition.

This research demonstrates that a project management can be reliable in managing an undefined project using both process and non-process factors that can be definable (or not), repeatable (or not) and predictable (or not). In doing so, it answers the research questions:

1. How can a Type-3 organization reliably manage a project with limited definability?
2. Can organizational-specific factors contribute to its project management capability and its increasing maturity?
3. What non-process factors contribute to this reliable project management capability?
4. Can interpretations of 'maturity' be context-specific (within this organization)? What specific factors contribute to these interpretations?

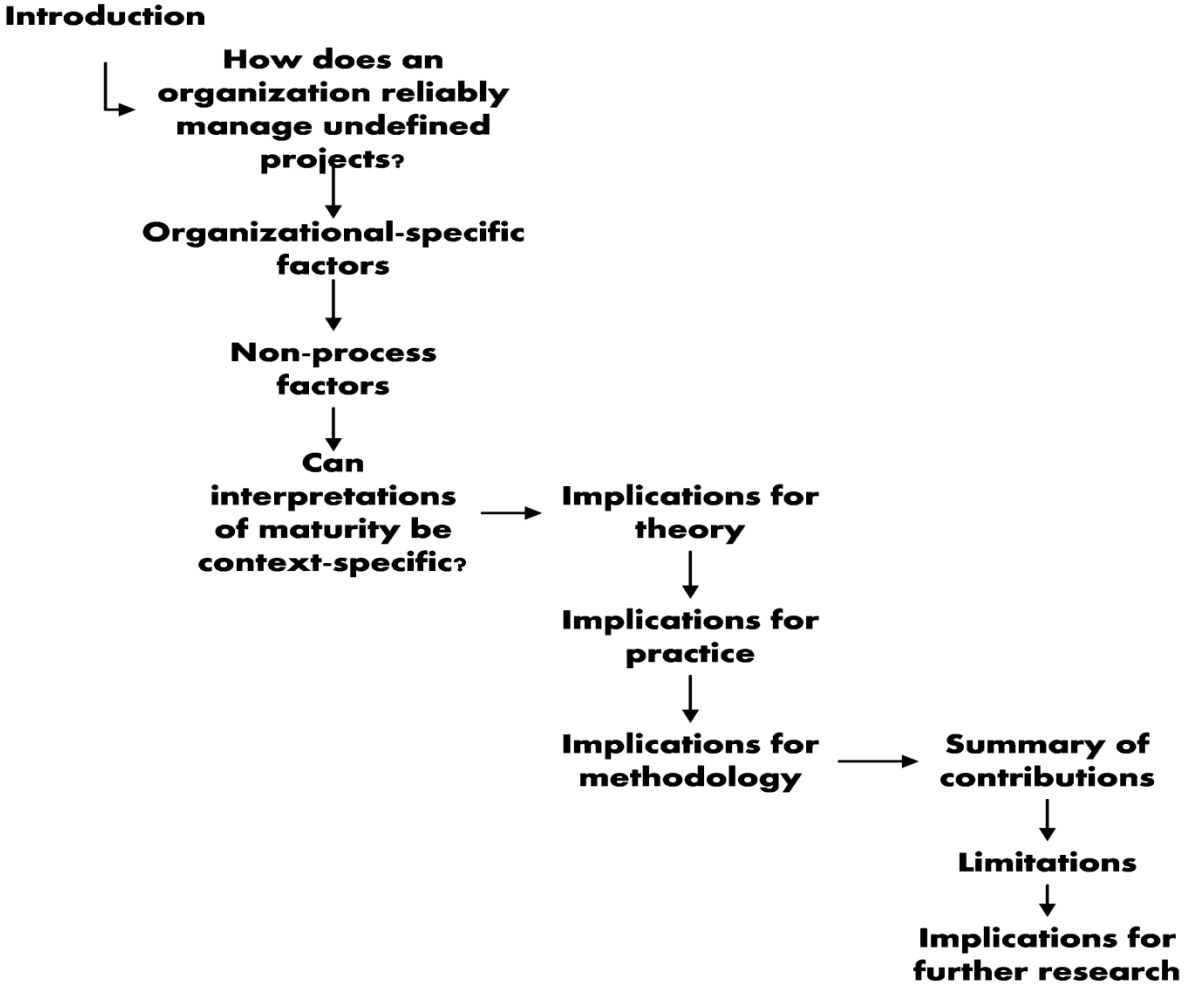

Figure 6-1: Pictorial outline of conclusions chapter (Pasian, for this research)

6.2 How does an organization reliably manage an undefined project?

6.2.1 Involve the customer

The goals of an undefined project must reflect customer interests. They will likely vary from project to project – but customer involvement directly contributes to defining project goals.

Defined projects will likely have customer interests from the beginning – stated up front and unlikely to be revisited through the project implementation. Once defined, the goals are set.

In an undefined project, that kind of stability does not exist. Involving the customer ensures their interests, perspectives, and agendas are met by project goals. This is essential – both to its definition and the organization's ability to manage it.

The creation of specific opportunities and mechanisms to directly engage customers will be a function within the project management capability—with an ongoing and implicit endorsement of the organization. Such a responsibility does not end with a project's closure. An organization must commit to customer involvement with every project's inception.

The involvement of customers in e-Learning projects is explored as an organizational-specific factor below.

6.2.2 Foster a culture of adaptability

Universities are a particular type of organization, but each one is different. Individual universities are governed by certain norms that, while global (at least to the Canadian community), can manifest and be interpreted differently.

This research has demonstrated that these universities have cultures of adaptability. They have interpreted the factors universal to their community in their own ways. Such a culture extends from its vision, through its teaching and learning agendas and right down to its individual course development and delivery.

A culture of adaptability—one that continually demonstrates a willingness to accommodate new circumstances, methods or customer demands—is better oriented to manage projects that are undefined. It accepts that which is inexact and defines it for itself.

Specific variables that influence the culture within this inquiry are discussed in detail below.

6.2.3 Be mindful of the 'human factors'

An undefined project is, by its nature, changeable and uncertain. Not knowing the project goal will generate questions and encourage stakeholders to look beyond the processes that have yet to create an end result.

Organizations responsible for such projects must be as mindful of 'human factors' as they are of the processes they manage. Trust, attitude, motivation—this research identifies these factors as critical to the management of undefined projects but not found in associated processes. The organizations within this research are acutely aware of their value.

Such factors can manifest in both process and non-process forms. Those relevant to an e-Learning project are discussed below.

6.2.4 Provide and support defined processes

The nature of a Type-3 project has defined methods and undefined goals. The organization in this research accommodates this reality by providing specific defined processes that are uniquely applicable to the project in question.

The provision of such processes is consistent with the needs of a Type-3 project and does not compromise the other components of an organization's management of undefined projects. Organizations responsible for other undefined projects are similarly obligated to provide suitable processes that support their management.

The defined processes associated with the management of e-Learning projects are explored as an organizational-specific factor below.

The data analysis resulted in a variation on the original conceptual framework. The final version representing the dominant nodes and specific elements therein are represented in Figure 6-2.

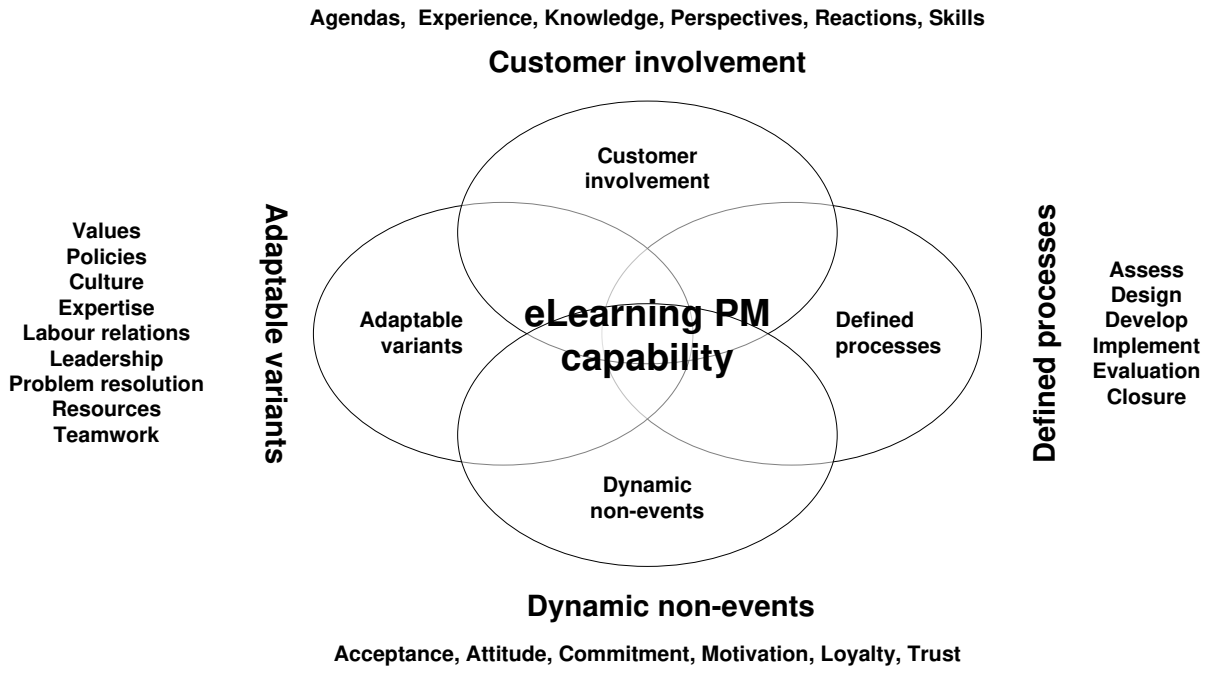

Figure 6-2: Consolidated version of CF (Pasian, for this research)

6.3 What organizationally-specific factors contribute?

Analysis confirmed factors specific to these universities can directly affect the emergence, development, and application of its project management capability and the processes and practices it contains. To use an *a priori* expectation or understanding of what is meant by 'project management maturity' without consideration of those factors is unrealistic and inappropriate in that setting, and impossible to measure by the maturity models that provide that meaning.

Specific factors need consideration to create an organizationally-specific view (or definition) of project management maturity as it relates to the management of an undefined project (such as e-Learning). They are discussed in the following sections.

6.3.1 Community values (academic freedom)

Respondents revealed a commitment to particular values (e.g. academic freedom) that, in their view, transcend the demands and potential benefits of strictly following a project management practice. In the absence of understanding these values, educational quality can suffer if the focus is on strict adherence to processes (5.13.3.v.).

In this setting, values are held by the entire institution that codifies its values and operating principles in its mission statements and strategic plans (Sections 5.3.1 and 5.9.1). Specific organizational units interpret the value of project management within a broader educational context – one that places the demands of teaching and learning over the potential efficiency of a project management capability (5.6.3 iv; 5.11.4 x).

Within a project management maturity framework, one can see no room afforded to such considerations within its definitions (see Section 2.4) or through the textual analysis of the current generation of project management maturity models (see Table 4-1). The question then becomes…how can adherence to these values be reconciled within an evolving project management capability that is subject to assessment?

Cleland and Ireland (2002, pp. 283-306) most closely address this question, but their analysis is within the context of organizational capabilities and the maturity models that might be created to analyze these broader factors. Within the project management activities of Alpha and Beta sites, respecting values happens within needs assessment (5.5.3.1.iii; 5.11.1i), the negotiation and approvals of project selection (5.11.2 iv), and planning (5.12.1 i).

Returning to the challenge of assessing a project management capability committed to organizational values, one could look at these specific activities. Where values are an integral element to managing projects, an organization could be considered more mature when consideration is given to—through the specific reconciliation of such strategic issues—within these tactical decisions.

6.3.2 Organizational policies

These university sites had several common policies in place, all of which had a direct impact on how the management e-Learning projects are managed – most especially the involvement of subject-matter experts.

Both sites had policies in place—notably academic freedom, release time and labour regulations—that affect specific dimensions of how projects were managed, and the participation of team members. While certain processes exist to implement and incorporate these elements in the project management capability, individual interpretation by subject-matter experts require one-on-one negotiation and coaching. Every team member was aware of the universality of these policies and are obliged to honour them, but interpretations still vary amongst these personnel.

Using highly defined and repeatable processes to facilitate their involvement is ineffective—they require more spontaneous and informal practices to interpret where problems exist and solve them in order to meet project goals. The reliability of the project management capability is dependent on such flexibility.

6.3.3 Expertise

Specific organizational roles or discipline experts can contribute to and influence how project management processes are interpreted and implemented (5.6.4, 5.8.1; 5.13.5, 5.13.10). These contributions and influences directly shape the management of individual projects as well as the ongoing development of the overall project management capability.

Current maturity models characterize significant project management contributions by individuals as 'heroic.' Such a view suggests limits: that only central 'characters' influence the project's management, and that their contribution is extraordinary. This study has shown that more than one team member can significantly contribute to effective project management in ways that reflect their unique perspective, experience and competence. A dependable and growing project management capability can be based, in other words, on professionalism, not heroism. Several examples are found in an e-Learning project management team.

Subject-matter experts (or individual departmental members) have been noted as 'lone rangers' (Bates 2000, p. 25) when managing e-Learning projects. By virtue of their training and ongoing professional research, they can remain distant from most departmental activities. Such independence has also been reinforced (for centuries) with respect to their teaching responsibilities.

Developing specialized content to an online course has introduced new challenges—forcing a greater degree of integration with and participation in organizational units outside their own (5.13.6). Their expectation of academic freedom has been threatened, as the requirement to provide content to digital media ('owned' by their institution) has been introduced (5.6.1).

'Shoe-horning' their participation in project teams using common (and repeatable) processes is unworkable and unrealistic (5.13.4 v). Individual interventions, through spontaneous and unpredictable efforts, is typical in e-Learning projects. Such acts are essential to this project management capability but, by their nature, immeasurable in a maturity assessment.

Instructional designers are, by nature and necessity, multilingual and multi-skilled (especially in a bilingual country such as Canada). Their training is in education theory and the design of learning materials for students of all ages (5.13.5 i). Such responsibilities requires them to consider multiple scenarios where learners are (individually) internalizing that which is being taught. Such multiplicity demands flexibility in how learning projects (of all types) are designed, development and implemented.

e-Learning projects are one example. While the learning objectives are broad but clear, their rendering takes on multiple forms—a reality made more complex by the endless scenarios possible in a digital (or online) world.

Being respected and trusted are key dimensions that enable an instructional designer to manage such projects (5.12.8). They are expected to be competent in both instructional design and project management, regardless of the surroundings, training or management accountability. Meeting this challenge (as demonstrated at Alpha and Beta), requires creativity in developing educationally-sound learning materials, awareness of organizational policies and project management resources and personal engagement that facilitates the involvement of reluctant experts and disenfranchised course developers.

Such traits manifest differently from person to person, as do the practices they use to meet these challenges. Expectations of repeatable and predictable are unrealistic, and can be interpreted (within current views of project management maturity) of an 'immature' project management project management capability. Within an e-Learning project environment, such flexibility is integral to its reliability.

Course developers are a third expert that is critical to the management of e-Learning projects. Typically a designer/programmer, these individuals directly contribute to the creativity and innovation of the project and its outcomes (5.13.14 v). For projects with undefined qualities, their adaptable skills are an integral part of the dependability of the project management function.

Often junior members of the team, they do not have management responsibilities but benefit from watching others in such roles. Such exposure develops project management skills in individuals who become increasingly responsible for future projects, and directly contributes to the evolution and dependability of the project management capability.

6.3.3.1 Specialized body of knowledge

Partnering a specialized, context-specific body of knowledge (instructional design) with project management methods forces a reconciliation of processes and creates opportunities for unanticipated practices. Instructional design is considered (at these sites) a separate and distinct body of knowledge with its own epistemology, processes, lexicon and history (5.13.3 viii). Staff may consider it (instructional design) an 'ideal' set of processes to which project management must be adapted (5.11.4 v). The prescribed project management processes in current maturity models will not be allowed to dominate.

To compare instructional design to, for example, a body of knowledge associated with construction or various sub-specialties of engineering is a reasonable one. Both require incorporation into a project management capability for it to serve project, program and portfolio interests. A key observation in existing project management maturity literature is, however, that current expectations and assessments of maturity lie in the definable, repeatable and predictable processes suitable for highly defined project management capabilities (such as those associated with a construction project) where requirements are nearly constant and unknowns (or variations) are rare.

An instructional design model, on the other hand, supports flexible and unrepeatable processes and practices that are necessary to serve the undefined nature of e-Learning projects.

6.3.4 Labour relations (union influence)

Key constituents—unions in this case—and their policies can dominate the Canadian higher education community. Virtually every staff and faculty member belong to at least one. Labour policies dictate staff roles and responsibilities, influencing (to varying degrees) their involvement, personal commitment and performance in specific project teams and, by extension, the ongoing reliability of the project management function. Wickens (2008, p. 559) cites a Canadian study indicating 'no significant difference between unionized and nonunionized departmental staff in their commitment to their university.' This research does not support this conclusion. Several factors affect the commitment of instructional designers and subject-matter experts to the management of these projects that are a direct result of union influence (5.6.9 vi, x; 5.6.6 iv.).

Managerial involvement in overseeing e-Learning projects at the Alpha site was dictated by labour regulations: senior managers and instructional designers were prohibited from directing instructional designers or other members of the e-Learning project team (5.6.10 x, xiii, xv). Despite authoring formal project management processes, the responsible manager did not have the authority and responsibility one would expect of such a role.

Participation of instructional designers was also directly affected by the constraints associated with the labour regulations. Job descriptions, emphasis on temporal seniority (rather than competency), and specificity of working conditions were all defined by unions and provided a strict framework in which personnel could manage projects. A 'sense of fairness' and deference to these rules trumped those associated with project management (5.13.18 iii, v).

The net effect of union influence was to create a challenging culture where (at Alpha) skilled and experienced instructional designers were often denied leadership roles by other staff who self-selected into project manager positions based on personal interests (5.6.6 iv). Other team members who were denied professional development opportunities (also by union stipulations) were also unmotivated to actively contribute to project management activities (5.7.5 v). Such realities negatively affected the maturation of the Alpha's project management capability.

At the Beta site, staff (especially the Production Manager) was more pragmatic with their union members. Recognizing the limits of both their job descriptions and the working hours, decisions are made to allocate specific tasks to those whose role and daily schedule best reconciled with union stipulations (5.13.18 iv, v). Repetitive production tasks best suited those staff who could absorb a well-defined job in their (pre)defined working conditions.

Unions are a common trait across Canadian higher education institutions, but their interpretation of the associated policies differ from site to site. Expecting universally defined processes to accommodate such policies – thereby facilitating a common path to maturity across these project management capabilities is unrealistic. Room must be left for individual practices to ensure team member involvement without compromising their involvement and sacrificing the realization of project goals.

6.3.5 Resources

Both sites were influenced by the availability or absence of resources. Connections exist between the provision of funds and management commitment, team morale and the individual reassurances of subject-matter experts. The involvement and attitudes of key project team members (notably subject-matter experts and course developers) are directly affected (5.6.5 iii; 5.13.7 iii). Shortfalls have tactical results (on meeting project objectives) and cultural impacts.

6.3.6 Teamwork

The roles and responsibilities of individual teams vary between organizations and individual projects (5.6.9 i; 5.13.15). Instructional designers, subject-matter experts, technical teams and unit management all participate in defining and realizing project objectives, but they vary in terms of their interactions, problem solving, morale and responsiveness to stakeholder interests.

Direct relationships exist between teamwork and virtually all other aspects of the project management capability. Adaptable variants influence who the team will work with (through their interactions with leaders, experts, union officials) and how they will work (as a result of interpretations of community values, organizational policies and the availability of resources). Their mastery and implementation of the defined processes will determine the path the project will follow. Facilitating customer involvement will contribute to the project definition. And the commitment, attitudes, willingness to negotiate and trust amongst teammates will affect the use of project processes.

6.3.7 Customer involvement

In identifying the organizational-specific factors affecting the management of e-Learning projects in this setting, 'customer involvement' is categorized here. The direct involvement of customers / end-users may follow defined processes but will typically introduce variations to them to accommodate the skills, perspectives and expectations of e-Learning project customers. The current view of maturity considers such flexibility problematic, even a weakness. Managing an e-Learning project represents an alternative view that sees customer involvement as a valuable advantage toward ensuring that project objectives are met. Facilitating their involvement using unanticipated, possibly unrepeatable processes (at a minimum between projects) indicates a flexible, accommodating project management capability.

Using the primary customers identified by Alpha and Beta (students and subject-matter experts), it has been shown that each participate in, contribute to and influence the project management capability in related but slightly different ways (see Tables 5-10, 5-20 and 5-21). Course developers are typically involved in the creation of the digital media and evaluation, while subject-matter experts are critical to the primary activity of content development. Each participate in key project phases (within defined instructional design processes) but often using other processes and practices that are flexible, spontaneous, unrepeatable and reliant on the discretion of the instructional designer (see Tables 5-7 and 5-18).

Analysis of project management maturity models indicate 'customers' as a factor of lesser importance when assessing maturity (see Table 4-1). Similar analysis of models outside of project management indicate it to have a higher significance (see Table 4-3). The involvement of customers in the management of e-Learning projects corroborates this latter view.

6.3.8 Defined processes

Defined processes have been categorized as an individual node throughout the data collection and analysis. For the purposes of identifying organizationally-specific factors that contribute to the management of undefined projects, it is included in this section.

The management of an e-Learning project is dependent on processes associated with the ADDIE instructional design model: both Alpha and Beta sites used variations within their units (see Sections 5-5 and 5-11). Assessing these processes is the focus of two existing maturity models currently in use by

segments of the higher education community. Marshall's *e-Learning Maturity Model* (2006) along with Neuhauser's (2004) *Online Course Design Maturity Model* both codify processes concerning the pedagogy of e-Learning projects, as well as their development, maintenance and evaluation. Institutional planning processes are also assessed.

These models support the idea that organizations (specifically post-secondary institutions) can have an entire capability assessed along certain dimensions and, consequently, provide a roadmap to improve underperforming processes. Neuhauser's model (2004, p. 4) provides a 5-stage model to facilitate such growth while Marshall (2006, p. 9) uses a Likert-style grid to indicate where processes can move from 'not adequate/practiced' to 'fully adequate.'

Both model sets were analyzed in Section 4.3.2 (Tables 4-1 and 4-3) and, in doing so, provided properties that were reflected in the conceptual framework—most notably the 'customer involvement' node. Many of the processes identified in both Marshall's and Neuhauser's models are in place at Alpha and Beta. They are discussed in this context to explore the limitations of only including defined processes in an assessment of a project management capability responsible for undefined (e-Learning) projects.

This research diverges from these models (thereby extending their theory) in two key respects:

I. Dynamic and ephemeral qualities are not represented in either model. Respondents at both Alpha and Beta widely supported the inclusion of such elements as trust, attitude, morale and motivation as factors enabling project management (and instructional design) processes through informal and spontaneous practices. While skeptics of such inclusion may argue that such dynamic dimensions are too unpredictable to be considered part of a reliable project management capability, data provided herein, along with maturity models from outside project management embrace such tacit qualities.

   The *Leadership Maturity Model* (7th-Wave-Solutions 2004), for example, includes 'emotional intelligence' as a discipline subject to assessment. Prosci's *Change Management Maturity Model* (Prosci 2004) includes 'employee surprise' at Level 1 of its assessment and 'employee resistance' across its levels. Both models assess initiatives with undefined dimensions – a characteristic they share with e-Learning projects. Clearly the door has been opened to consider such ephemeral characteristics—managers and assessors of e-Learning project management capabilities need to walk through.

II. This research reveals certain factors to be adaptable within each site and variable across institutions in the same community. Funding, for example, is the direct responsibility of Unit management at Beta REF and, consequently, puts them in a more dominant and responsible position to select and prioritize projects. Alpha management, on the other hand, does not have such authority, yet their capability still manages projects reliably. Using the parameters of the e-Learning Maturity Model, where 'formal criteria are used to allocate resources' for individual projects (Marshall 2006, p. 7), one could suppose that not satisfying this process suggests 'inadequacy.' Such assessments do not reflect the realities presented in this research.

Variables as diverse as funding, training, relationship-building and values interpretation all influence the project management capabilities at Alpha and Beta (to varying degrees and not always with a positive outcome). Both the e-Learning and Online Course Design maturity models follow the same philosophical conventions of most project management maturity models which is to determine maturity on binary decision-making. Is funding present? If yes, an adequate process is present. If not, an inadequate process is in use (or not at all).

Alpha and Beta demonstrate flexibility in assessing these variables. Because one site manages its funding (to continue the example) differently than another does not necessarily make its processes less adequate or 'immature.' It may have, through its own inventiveness, developed an approach that, quite simply, works for them. Eliminating such possibilities to follow the prescriptive elements of any maturity model bases maturity on conformity, not ingenuity or flexibility – qualities indicative of progress and growth.

The ADDIE processes are an integral part of the management of e-Learning projects. The literature is clear on this, as is the evidence provided at Alpha and Beta. Where differences emerge is with the flexibility that can be employed in adapting these processes to suit the project management capability of a specific university site. Facilitating such flexibility are the adaptable variables introduced by other dimensions of the organization.

Certain variables—such as values interpretation, unit leadership, and organizational integration—have been shown to specifically influence how some of the ADDIE processes are managed. Such relationships underscore the partnering of organizational variables with more universal processes. In so doing, the argument that a mature project management capability is based (largely) on highly defined, repeatable and predictable processes is further challenged.

6.4 The contribution of non-process factors

There are factors that support a project management capability that are undeniable, immeasurable, and dynamic. By considering such factors as attitude, commitment, negotiation, and trust—and the natural extension, creativity—this research underscores the trio of characteristics offered by Andersen and Jessen (2003) who advocate the achievement of maturity as the sum of action, attitude and knowledge. They also reinforce the research of Walker and Johannes (2003) who document the importance of trust, commitment and loyalty within project environments.

Evidence provided by Alpha and Beta reinforce this position: not only did respondents advocate attitudinal factors, they extended those offered in the conceptual framework. In the words of one manager, 'Trust is number one. Teamwork, culture, those are very big and in the absence of these, then process we can fall back on.'

The most dominant factors—as identified in the revised conceptual framework (Figure 6-2)—are discussed below.

6.4.1 Attitude and acceptance

Team members at both sites remarked on the influence a positive or negative attitude had on project management activities. Senior management—including the Dean and directors at each Unit—could drastically affect project progress through their attitudes and lack of recognition of the proceedings (5.6.7 ix).

Faculties compulsory involvement was, from a project's inception through initial planning and content development, always a function of their attitude. Their regard (positively or negatively) toward the use of new / online technology, the constraints and obligations associated with release time and intellectual property negotiations, through the development sessions with instructional designers and course developers, were undeniably influential and affected their involvement in daily project management processes (5.6.8 ii, iv; 5.12.5 vii).

Project initiation could be affected by SMEs attitude (5.7.2; 5.12.2) on teaching and learning, which is not in itself problematic but indicative of their mindset. Frustration required management by instructional

designers. More constructively, positive attitudes reinforced engagement and likelihood of continued involvement across programs and not just individual projects.

Course developers, on the other hand, could be relied upon to have more enthusiasm for the project and their participation in its management – a factor common to both sites (Tables 5-11, 5-22).

6.4.2 Commitment and motivation

A willingness to negotiate toward project outcomes was also a key dimension that facilitated relationship-building (5.11.1 i,iv). On the basis of those relationships, different elements of project administration and goal setting could be determined.

The commitment and willingness to negotiate requires motivation by the person involved. Both sites indicated enabling processes that supported stakeholder interest. For some, it was a question of reminding some of the project's reflection of institutional values. For others, the use of informal techniques during the content development stages was crucial.

On an administrative level, subject-matter experts were particularly motivated if release time and funding were secured (5.7.6 ii; 5.12.5 vii). Those interested in the use of technology (both course developers and subject-matter experts) came to the project highly motivated.

Discouragement and low morale, on the other hand, surfaced when labour regulations affected team composition and professional development opportunities (5.7.5 i, iii).

The emergence of these factors corroborates the relevance of research noted earlier in Chapter 4, Section 4.4.5., where Dwivedula and Bredillet (2010) discuss the importance of motivation of project team members, and where Flannes and Levin (2005) explore the leadership of project leaders in reinforcing this dimension of their team members.

Negotiation is a natural extension of stakeholder/customer attitude and can be seen at managerial levels and individual connections. Unit acceptance was affected by the degree to which projects could be seen to reflect institutional values. If managers and subject-matter experts perceived an emphasis on the 'business nature' of project management, tensions would develop (5.6.3 iv). Both sites recognized that commitment

was found through a sense of ownership of processes (reflecting academic priorities) by all customers (5.7.3 viii). Such ownership was reinforced when seeing content being developed (5.7.3 v).

6.4.3 Trust

The cornerstone to these dynamic elements—the one that binds them together—is the element of trust. Introduced during data collection at the pilot site (see Appendix #3, Section K), it was given clearer articulation after reading *Managing the Unexpected* (Weick & Sutcliffe 2001). While these researchers used the example of 'safety' (a dynamic and immeasurable quality that provides stability to compensate for changes in a complex environment), it became as understandable in the project management environment under study here. It was included in the conceptual framework on that basis.

At the pilot site, a project manager recalled the following example:

'…a course author was at the office 'every day, working on various aspects of a course.' In doing so, the author receives direct encouragement and direction from project management staff and increases his understanding of the problems within the project. This greater awareness further allows project team members to be more responsive and expand their communication with other project customers (i.e., the sponsoring department). In the words of one project manager, a trusted customer can serve as a 'proselytizer.'

Similar recollections were offered by Alpha and Beta interviewees who observed 'trust' as a factor that influenced several facets of the project management capability.

- The Initiation and Planning stages of manage e-Learning projects were affected by the presence or absence of trust, as was the change management processes contained within (5.11.8 iii).
- Monitoring / tracking of project progress and regular communications to subject-matter experts (5.12.8 i, xiii).
- Clear reflection of institutional values (5.13.3 v).

- Teamwork could be impacted by trust, especially when poor staff selection affected the project manager role (5.6.9 v). It is reinforced through the demonstration by instructional designers of multiple skills (5.12.8 vii).

- The perceived expertise or credibility of a team leader was a barometer of their trustworthiness (5.6.4 ix). Moreover a change in leadership empowers team members if 'they feels it's someone they could trust' (5.12.8 ii; 5.13.8 vii).

- Relationship-building—especially between subject-matter experts and instructional designers—is built on the presence/absence of trust (5.13.11 iii,; 5.13.11).

- Raising awareness and understanding with subject-matter experts and managers of the contribution of a project management approach in a pedagogical conversation. Such 'diplomacy' builds trust (5.13.8 vi).

6.5 Can interpretations of project management maturity be context-specific?

Definitions of project management maturity vary from specific technical measurements to broader views encompassing skills, attitudes and knowledge. Based on this, it seems reasonable to suppose that individual interpretations can be found between those extremes. Looking no further than the collection of maturity models from outside the project management community (Table 4-2), evidence is clearly found affirming individual interpretations of maturity. Based on factors discussed earlier in this chapter, another example of such 'individuality' has emerged here.

6.6 Implications of the findings for theory

This research demonstrates that a project management capability responsible for undefined projects could achieve reliability using processes and non-process factors. This offers a clear alternative to project management maturity theorists who rely on the principle of process control (and an organization's ability to define, repeat and predict the performance of those processes) as the key determining factor in indicating maturity. By extension, it broadens potential definitions of maturity to include non-process factors and forces designers of assessment models to consider adjustments.

Expanded views of maturity could reflect greater customer involvement, thus reinforcing the Juranian view that customer satisfaction was as important to quality management as minimizing process variations (although he never argued that these factors were mutually exclusive). As these sites have shown, it is through the involvement of customers that goal definition can be determined and appropriate processes can be more effectively managed. Such flexibility is not supported in current maturity assessments where the definition of both goals and methods is associated with an efficient application of definable, repeatable and predictable processes.

This research has also shown that context or organizationally-specific values and/or policies are an integral part of the organization's view of the potential value and use of project management methods. In prioritizing such specific factors, organizations (such as universities) are making clear that project management processes are to be reconciled with others that they consider more relevant to their projects. Such reconciliations challenge the universality of current views of project management maturity that demand highly defined project management processes.

In light of this research, the design of project management maturity models need re-examination. It has been shown that the SEI/CMM dominates the project management approach to maturity modeling along with a reliance on specialized project management bodies of knowledge. If one accepts that other processes and non-process factors can contribute to a reliable project management capability, one must also consider that the models used to assess it should reflect those elements. Rather than apply a single project management model universally, more flexible models could be explored that lend themselves to adaptability in a specific context. Such flexible models will likely force a departure from the more common 2-dimensional design (where maturity increases as a function of satisfying prescribed processes and their corresponding levels).

A new generation of project management maturity models could explore a multi-dimensional approach where increasing project management reliability strikes a balance between project management activities, more specialized processes and practices and universal enablers (such as trust and creativity) that are present but not easily measured or categorized.

6.7 Implications for practice

In examining the implications of this research for practitioners, the focus is on two issues: the designers of maturity models and their users.

Designers of the current generation of project management maturity models have relied heavily on the structure, content and ascension design codified by the SEI/CMM. This approach, as discussed in Section 2.6.3, has a specific definition of maturity that relies on the principle of process control. It has been further shown that such a design is quite suitable for industries and organizations that manage projects of a highly defined nature—there is a consistency in assessing those defined processes that are responsible for managing defined projects. However, the inflexible nature of these models is less suited to assess project management capabilities where the processes, practices and enablers of the management of undefined projects make them less directly applicable.

Future designers need to deepen their understanding of organizations and project types that do require flexibility in their processes and practices within their project management capability. The increasing use of project management as an instrument to execute strategy and facilitate organizational change will continue, forcing designers to adjust the prescriptive nature of the current modeling approach and adopt a more flexible orientation. As it has been shown in this research, such models must consider processes and practices that are not necessarily motivated by the need to control variations in an effort to increase the efficiency. Other motivations—such as the reflection of values, the involvement of customers and the embrace of dynamic factors such as trust and creativity—need consideration.

Designers of future models may want to consider a stronger organizational approach to a maturity model design that allows such flexibility without suggesting these factors—because they are often not repeatable or predictable—are indicative of an immature project management capability.

In extending this discussion toward users of project management maturity models, practitioners are encouraged to be more critical in their selection and adoption and, ultimately, the acceptance of assessment data generated by them.

It has been shown in this research that there is a fundamental disconnect between the current generation of models and their reconcilability in assessing project management capabilities responsible for undefined projects. According to the Turner and Cochrane typology (1993), there are three other project types with

undefined goals and/or methods. Such project types can be found in dozens of industries and thousands of organizations.

These practitioners represent a constituency that is not being served by the current generation of models that insist on the demonstration of definable, repeatable and predictable processes to determine the maturity of their project management function. Such an assessment can be deeply flawed in directing practitioners down a road of adjusting their project management capability using markers that are not appropriate.

Project management practitioners can be served by alternative model designs that suit their needs. As discussed earlier in this section, these designers need to offer variations on the current approach to project management maturity modeling to accommodate the more flexible processes and practices used by practitioners responsible for managing undefined projects. These organizations are not currently be served by existing models.

e-Learning projects also represent only one project type that, using the Turner and Cochrane definitions (see Table 2-7) , have undefined characteristics. In particular, e-Health projects are similar to their e-Learning counterparts in their use of customers, emphasis on 'human factors,' and adaptable organizational qualities that influence how projects are managed. Moreover, many of the organizations responsible for these projects are within the public domain and, as such, are driven by values that may have nothing to do with the efficiency expected of process control. This methodological framework supports their specific organizational context and justifies such factors in considering the maturity of their project management capability.

6.8 Implications for methodology

Multimethod research is a relatively new design strategy. Unlike its '*mixed* method' counterpart, it relies on two or more methods from *either* a quantitative or qualitative framework. Advocates of pragmatism are giving the choice of using 'quan' and 'qual' methods in either a concurrent or sequential strategy, with dominance (QUAN or QUAL) placed on the appropriate stage (Burke Johnson & Onwuegbuzie 2004, p. 12). Examples include QUAN + QUAL, QUAN → qual.

Users of multimethod designs are given similar choices, as explained in Sec 3.4.2, but existing strategies are limited – neither Burke Johnson and Onwuegbuzie (2004) nor Morse (2003) indicate the possibility of

a sequential qualitative strategy where the second stage is more dominant than the first (see Table 3-2). This inquiry demonstrates the value, indeed the necessity, of this strategy because the first qualitative method does not provide sufficient data to satisfactorily answer the research questions. It does, however, provide an essential step (in the form of a conceptual framework) toward informing the second stage where another qualitative method (in this case, a case study) is used.

Future researchers can use this strategy as a framework for similarly challenging inquiries where a partnership exists between multiple methods that are mutually reinforcing but unable to provide sufficient data independently.

This methodology also has broader implications for its possible use in other post-secondary institutions (certainly in the Canadian higher education community), other organizational types, industries and project types. All could consider this methodology to investigate the sophistication of their own project management capabilities.

6.9 Summary of contributions to knowledge

The literature review, research design and findings have contributed to knowledge within project management and, potentially against multiple other fields of inquiry. Table 6-1 summarizes these contributions.

Table 6-1: Summary of research contributions (Pasian, for this research)

Research Issue	Status of Research Issue in existing Literature	Contribution of this Research
How organizations can maturely manage projects with limited definability (primary research question #1)	Not discussed in the literature.	An addition
Contribution of organizationally-specific factors to project management maturity assessment (primary research question #2)	Not discussed in university context or with e-Learning projects.	An addition
Contribution of unique non-process factors to project management maturity assessment (primary research question #3)	Not discussed in the literature.	An addition
Context-specific interpretation of project management maturity (primary research question #4)	Can be inferred from maturity assessment discussions but not explicitly demonstrated.	An advance

Research Issue	Status of Research Issue in existing Literature	Contribution of this Research
Definition of project management maturity characteristics	Discussed in the literature with examples provided. However, no agreement exists.	An advance
Project management maturity model design	Basic descriptions offered. Full comparison of current model generation not available.	An advance
Project management maturity models compilation	Specific PM models summarized without inclusion of industry-specific PM models.	An addition
Analytical framework of project management maturity models	Some descriptions available. New terminology added.	An advance
Reconciliation of maturity models within project typological framework	Not discussed in the literature.	An addition
Textual analysis of maturity models	Not performed in project management research.	An addition
Use of meta-matrix data collection and analysis	Not performed in project management research.	An addition
Research design	Recent introduction of multimethod research but without use in project management inquiries.	An addition
Research design: multimethod project sequencing	New variation on multimethod research project sequencing	An addition
Analysis of project management maturity within a university setting	Some analysis offered.	An advance
Identification of non-process factors in a university project management capability	Some analysis offered. New factors identified.	An addition
Customer involvement in capability maturity	Some discussion in TQM literature. Some mention in project management maturity models.	An advance
Project team responsibilities in university project management capability	Some analysis available. Fuller descriptions offered in maturity context.	An addition
Reliability of project management capability in university setting	Some process-oriented analysis and description offered. New non-process factors offered.	An addition

Research Issue	Status of Research Issue in existing Literature	Contribution of this Research
Tacit factors within project management maturity	Not discussed in project management maturity literature (including models).	An addition
Relationship of process and non-process factors in project management maturity	Some discussion. New factors identified.	An addition

6.10 Limitations

Researchers and practitioners can move beyond the limits of this research and explore different projects types in different organizations within both the public and private sectors. The conceptual framework used in this exploratory study has confirmed that multiple non-process factors can contribute to the reliability and increasing sophistication of a project management capability within a specific organization (a university) responsible for a specific project type (e-Learning). The major nodes used here provided a framework for categorizing these factors, but other organizations could build on them to frame variables, customers and dynamic factors that influence their management of other specific projects.

The Turner and Cochrane (1993) typological framework was used here to deliberately set boundaries and place clear limitations on the use of e-Learning projects as a specific example of an undefined project. These boundaries also, by implication, liberate researchers to consider other project types—either from this framework or others. Various industries, organizational types and knowledge domains were identified (in Table 4-2) as having maturity models in use or development. Their properties were used to influence this inquiry but could also inform efforts to build project management maturity models in other project settings.

6.11 Implications for further research

The challenge put forward in this research was for project management maturity theorists to recognize the possibility of finding maturity in a project management capability responsible for undefined projects. This challenge has been met. The focus can now turn to other environments where other project types

(undefined or not) are also being managed using processes (and/or practices) that are not necessarily definable, repeatable, predictable and unique to that setting.

Creating models to assess quality (as in the Quality Management Maturity Grid) or maturity (since the launch of the Capability Maturity Model) is a common step in this area. But as the definition of maturity must be reconsidered, so must the models that assess it. Investigations and experiments (using both qualitative and quantitative research designs) can expand the boundaries of current project management maturity models beyond the prescriptive content (that reflects common bodies of project management knowledge). New processes, practices and ascension designs could be reflected in a second generation of project management maturity models.

Finally, the management of e-Learning projects is one of countless examples of uniquely undefined project types. Through this research, project management maturity theory has been expanded by virtue of looking through a project typological framework to consider processes and practices that are not strictly controlled and are often unrepeatable and unpredictable. In doing so, the challenge is put to other organizations to examine the projects they manage to see how their unique project management capability is being supported by similarly flexible processes, practices and other enablers on its way to maturity.

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Appendices

Appendix #1: Full Case study protocol

An exploration of project management maturity at Canadian universities

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I. Overview

This thesis focuses on project management maturity as achieved by universities who have used the management of strategic projects (such as e-Learning) to develop their project management capability. These projects—and their project management environments—present an opportunity to examine project management processes where the perceptions, expectations and techniques for managing the e-Learning projects were initially uncertain or undefined. Project management was immature across the community as a result. A decade later, many examples can be found of institutions where both adoptions of generic project management processes have widely occurred, and adaptation of these processes to address context-specific skills and knowledge has also happened. Project management maturity across the university community is demonstrably higher now than it was when e-Learning emerged in the mid-1990s.

The theoretical response to increases in project management capability is to assess the capability using project management maturity models. But these models are applied with a broad brush, and do not address the unique project management practices of organizations (such as universities) which have accumulated their own exclusive collection of project management skills, knowledge and processes.

The experience associated with universities' managing their e-Learning projects represents an interesting opportunity to examine the development—or maturation—of a project management capability in a unique organizational setting that hasn't been assessed using project management models. These are industry-specific projects with multiple stakeholders from across the university, and specifically implemented to deliver on organizational strategy.

This research does not intend to address the justification of project management by universities. Nor will it address the issues related to the justification or efficacy of e-Learning. The main purpose of this research, therefore, is to identify the variables that affect the achievement of project management maturity by a university when managing technology-enabled learning projects.

II. Data collection activities

WHO WILL NEED TO BE INTERVIEWED?
Interviews will be needed with multiple stakeholders who have a unique relationship to the project management capabilities at your institution. To capture the best range of perspectives, people who have served in the following roles are most desirable: project sponsor, project manager, instructional designer, educational technologist, and faculty who have served on project teams. You are encouraged to nominate other individuals or roles whom you feel could offer a unique perspective.

WHEN IS THIS RESEARCH SCHEDULED TO HAPPEN?
If convenient for you, I would like to schedule interviews and arrange access to your campus sometime during the period between October 26th to November 6th. It would be preferable to schedule the interviews over a few days, subject to everyone's availability. Interviews that cannot happen during my on-site visit can occur later by phone.

ARE THERE ANY RISKS?
This research has been carefully designed, thereby bringing risks to an absolute minimum. This is a qualitative study using in-depth interviews as the primary data collection technique, presenting little opportunity for physical harm (at least no more than a normal day at the office).

WHAT HAPPENS TO THE DATA?
The data will be collected and stored by myself and/or my supervisor, Professor Spike Boydell. Its maintenance and disposal will occur in accordance with the information management practices of my university. Your access to your data will be unfettered and unconditional throughout the process. And once the analysis is complete and my thesis has been submitted (likely in mid-2010), you will be given a copy.

HAS THIS RESEARCH RECEIVED ETHICS CLEARANCE?
Yes, it has. If you have questions or concerns about the research, you are encouraged to contact me, my supervisor or the Research Ethics Office of UTS (+61 (0)2 9514 9615). Any complaint you make will be treated in confidence and investigated fully and you will be informed of the outcome. Please quote file # 2008-176A.

III. Participation of Interview subjects

WHY HAS MY INSTITUTE BEEN ASKED?
Your institution was nominated by your peers in the Canadian higher education community as one which has demonstrated a high degree of project management capability (specifically related to the management of e-Learning projects). Further investigation into the higher education literature and the information publicly available about your institution underscores this perception. Both these facts lead me to conclude that your site would make an ideal candidate for an in-depth case study.

IF I SAY YES, WHAT WILL IT INVOLVE?

- A face-to-face interview with me on various topics concerning the management of e-Learning projects and your role within this function;

- Providing access to institutional artifacts and documentation that relate to the management of e-Learning projects. (The request for the list of published and unpublished articles and documents is an example of this.)
- Possible follow-up questions and/or access to additional supplemental information.

WHAT IS THE TIME COMMITMENT?
The interviews themselves will take approximately 90 minutes each, and will occur at your office or on the telephone. Reviewing artifacts and documentation related to your institution's project management capabilities (as they relate to and support e-Learning projects) will take some additional time but could easily be worked into the few days scheduled for the interviews.

DO I HAVE TO SAY YES?
No, you do not.

HOW DO I INDICATE MY AGREEMENT?
If you are agreeable to participating in this research, please sign and return the enclosed consent form to my attention. You can do this by email (enclosing a scanned version of the signed consent form) or by fax. My contact details are: emailme@beverlypasian.com or beverly.pasian@uts.edu.au.

WHAT WILL HAPPEN IF I SAY NO?
Nothing. I will thank you for your time so far and will not contact you about this research again.

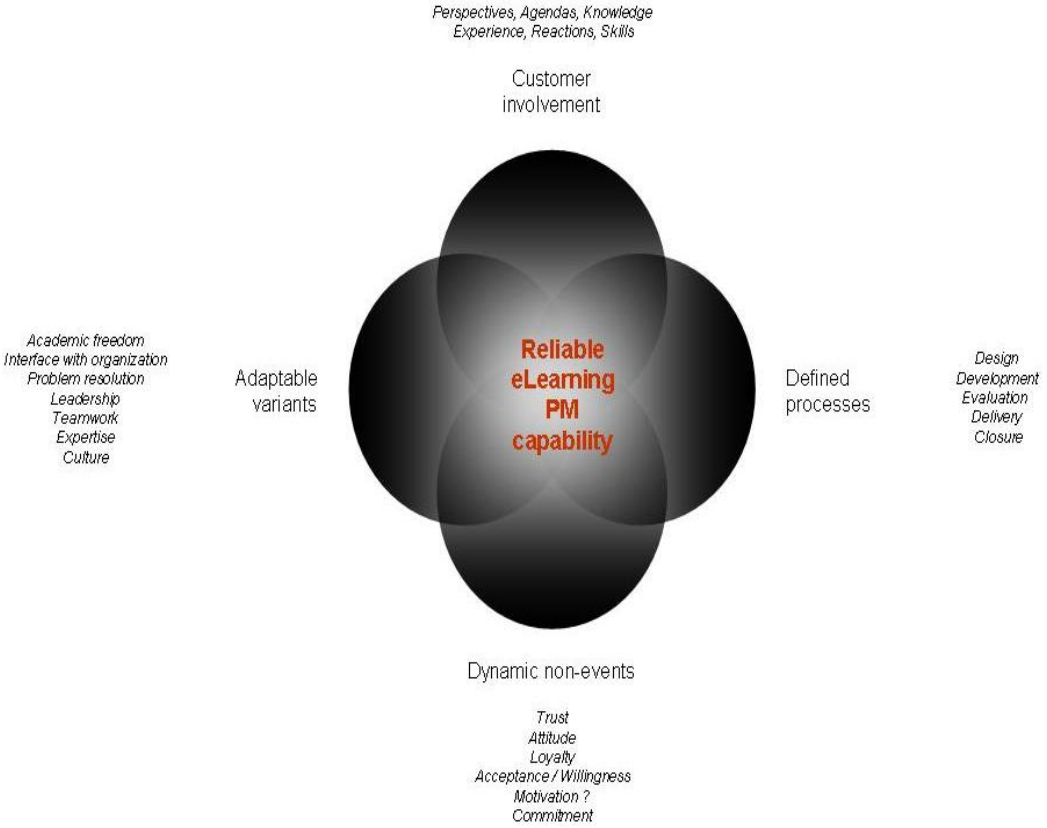
IF I SAY YES, CAN I CHANGE MY MIND LATER?
You can change your mind at any time and you do not have to say why. I will thank you for your time and will not contact you about this research again.

IV. Summary description of data collection procedures

The figure and table below summarize the themes to be addressed in the conceptual framework and the data collection techniques associated with each. (More details on this map can be provided during the onsite visit.)

V. Ethics clearance

This study has been approved by the University of Technology, Sydney Human Research Ethics Committee. If you have any complaints or reservations about any aspect of your participation in this research which you cannot resolve with the researcher, you may contact the Ethics Committee through the Research Ethics Officer (ph: 02 9514 9615, Research.Ethics@uts.edu.au). Any complaint you make will be treated in confidence and investigated fully and you will be informed of the outcome. Please quote file # 2008-176A (the specific number assigned for this research).



	Major themes			
	Defined processes	Customer involvement	Adaptable variants	Dynamic non-events
Semi-structured interviews	Y	Y	Y *(Depends on person*)*	Y
Direct observation	Y	Y	*(Depends on variant)*	Y
Documentation	Y	Y	TBD	TBD
Archived records	Y	Y	TBD	N
Physical artifacts	Y	Y	TBD	N
Field notes	Y	Y	Y	Y

CONSENT FORM

I, _____, agree to participate in the research project entitled, 'An investigation into project management maturity at Canadian universities,' being conducted by Beverly Pasian (Student no. 10380261, beverly.pasian@uts.edu.au) of the University of Technology, Sydney for her Doctorate in Project Management.

By signing this form, I acknowledge that:

- I understand that the purpose of this study is explore project management maturity as achieved by universities who have used the management of strategic projects (such as e-Learning) to develop their project management capability. The main purpose of the research is to identify the variables that affect the achievement of project management maturity by a university.

- I understand that my participation in this research will involve: an interview with Beverly Pasian, the identification of faculty and staff for separate interviews, provision of artifacts and documentation related to my university's project management practices (specifically concerning the management of e-Learning projects), and responses to specific questions designed to assess my institution's project management maturity.

- I am free to withdraw my participation from this research project at any time I wish, without consequences, and without giving a reason.

- I agree that while I will not be personally identified, it will be necessary to disclose my relationship to the information provided to give that information authority. This will be limited to the identification of my role within the institution.

- My institution will not be named, although a generic description will be offered.

- The data obtained from my institution will either be stored or disposed of at UTS in a manner consistent with their information management protocols.

- My questions concerning the research have been answered fully and clearly, and that Ms. Pasian is available (along with her supervisors Prof. Spike Boydell (spike.boydell@uts.edu.au) or Dr. Shankar Sankaran (shankar.sankaran@uts.edu.au)) throughout the investigation to answer additional queries should they emerge.

Signature & date

(Institutional contact)

Signature & date

September 2009

(Beverly Pasian, Researcher)

Appendix #2: Full list of maturity models

The following lists each maturity model (by subject area) referenced in Sections 4.2.1 (project management) and 4.2.3 (models outside of project management).

Action Research

- *A maturity model for Information Systems Action-Research Project Managemen*t (Estay-Niculcar & Pastor-Collado 2002)

Agricultural Sciences

- *Pear Scab: Components of Potential Ascospore Dose and Validation of an Ascospore Maturity Model* (Spotts, Cervantes & Niederholzer 2000)

Business Development

- *Capability Maturity Model for Business Development* (McGraw, Chess & Migues 2009)

Building Security / Infrastructure

- *Building Security Maturity model* (BDII, 2007)

Business—IT Alignment

- *Developing an Inter-Enterprise Alignment Maturity Model: Research Challenges and Solutions* (Tapia, Daneva & van Eck 2007)
- *Validating Adequacy and Suitability of Business-IT Alignment Criteria in an Inter-Enterprise Maturity Model* (Tapia, Daneva & van Eck 2007)

Change Management

- *An Agile Enterprise Reference Model with a Case Study of Remmele Engineering* (Dove & Hartman 1996)
- *Prosci's Change Management Maturity Model* (Prosci 2004)
- *The Process Audit* (Hammer 2007)

Cloud Computing

- *Cloud Computing: Business Models, Value Creation Dynamics and Advantages for Customers* (Jaekel & Luhn 2009)

Community Management

- *The Community Maturity Model* (Happe & Storer 2009)

Computing Education

- *A Maturity model for Computing Education* (Lutteroth et al. 2007)

Contracting Management

- *Contracting Capabilities in Project Business: Proactive Management Approaches to Contracting* (Sorsa & Salmmi-Tolonen 2009)
- *eSourcing Capability Model: A Measure of High Performance* (Comerford 2004)

Criminal organizations

- *Maturity levels for criminal organizations* (Gottschalk 2008a)

Data Warehousing

- *Data Warehousing Process Maturity: An Exploratory Study of Factors Influencing User Perceptions* (Sen, Sinha & Ramamurthy 2006)

Earned Value Management

- *EVM System Certification: The EVM Maturity Model* (Stratton 2002)

E-Government

- *eGovernment Maturity* (Windley 2002)

E-Health

- *e-Health Interoperability Maturity Model* (NEHTA 2007)

e-Learning/Online course design

- *e-Learning Maturity model* (Marshall 2006)
- *A Maturity Model: Does it Provide a Path for Online Course Design?* (Neuhauser 2004)

Email communications

- *Maturity model for email communications in knowledge organizations: The case of police investigations* (Gottschalk 2008b)

Engineering education

- *Towards an Engineering Education Capability Maturity Model* (Petrie 2006)

Enterprise Architecture

- *Enterprise Architecture Maturity Model* (Mukherjee 2008)

IBM Data Governance

- *The IBM Data Governance Council Maturity Model: Building a roadmap for effective data governance* (IBM 2007)

Information Process

- *Information Process Maturity Model* ('Information Process Maturity Model')

Infrastructure

- *The Smart Grid Maturity Model* (SEI 2009)

Internet Maturity Model

- *The Internet Maturity Model* (Terry 2007)

Knowledge Management

- *Holistic Development of Knowledge Management with CMM* (Ehms & Langen 2002)

Leadership

- *Introduction to the Leadership Maturity Model for Developing Effective Leaders* (7th-Wave-Solutions 2004)

Learning Governance

- *Governing the Learning Organization in an era of Strategic Human Capital Development and Management* (Ricketts & Manville 2009)

Marketing

- *A Marketing Maturity Model for IT* (Hirschheim, Schwarz & Todd 2006)

Network Engineering

- *Concepts for a Network Maturity Model* (Capone et al. 1998)

New product development

- *Maturity and its impact on new product development project performance* (Dooley, Subra & Anderson 2001)

Offshore Industries (Design & Safety)

- *Capability maturity models for offshore organizational management* (Strutt et al. 2006)

Open Source programming

- *The Open Source Maturity Model* (Navica 2008)

Procurement management

- *Securing the Supply Chain* (Tenney & Bernard 2009)

Project management

- *Construction Project Management* (Fengyong & Renhui 2007)
- *Evolutionary Software Project Management* (Sukhoo, Banard & Van der Poll 2007)
- *Infrastructure Maturity Tool* (Hertogh et al. 2008)
- *Open Maturity Model* (Lubianiker, 2000)
- *OPM3* (PMI 2003)
- *Prince 2* (OGC 2006b)

- *P3M3* (OGC 2006a)
- *Project Management Process Maturity (PM^2) Model* (Kwak & Ibbs 2002)
- *Project Management Solutions* (Crawford, Hobbs & Turner 2006)
- *ProMMM* (Hillson 2001)
- *Strategic Project management Maturity Model* (Kerzner 2005)

Requirements Engineering

- *A measurement framework for assessing the maturity of requirements engineering process* (Niazi, Cox & Verner 2008)

Security Testing, Management

- *Security Maturity Model* (Aceituno 2003)

Software Maintenance, Testing

- *Assessment Results using the Software Maintenance Maturity Model* (April et al. 2005)
- *A Model to Assess Testing Process Maturity* (Burnstein et al. 1998)

Systems Usability

- *Usability Maturity Model* (Earthy 1998)

Teen Pregnancy

- *Untangling the Health Disparities of Teen Pregnancy* (Talashek, Alba & Patel 2006)

Appendix #3: Pilot site report

A. Site description

The pilot site is a major university serving approximately 30 000 students (full- and part-time) in a large urban community. An extensive catalogue of undergraduate and graduate faculties are available as well as research programs in myriad disciplines, professional schools and a department of continuing studies. 5 000 (full- and part-time) faculty support these teaching, learning and research demands.

Four modes of delivering teaching and learning are used: face-to-face, online, distance and 'mixed mode' (a combination of any of the three). A Unit exists entirely devoted to supporting the associated teaching and learning mechanisms staffed by various professional occupations and organizational roles. For the purposes of this research, however, only those relevant to the management of e-Learning projects were chosen.

B. Team roles

Role	Expected	Provided
Sponsor (Dean)	Yes	Yes (1)
Senior Manager	Yes	Yes (1)
Department Head	Yes	No
Instructional designer / Project manager	Yes	Yes (4)
Subject-matter expert	Yes	Yes
Course developer	Yes	No

C. Participant definition of 'customers'

Throughout interviews at pilot site, references were made to 'customers' as SMEs and students. Passing comments were made, however, to 'others' who disagreed with the respondent's definition. Clearly there were underlying tensions and issues amongst concerning the perception of both SMEs and students as primary customers.

D. Detractors

One member of the project management staff (in a project manager role) offered a detracting opinion from the majority who agreed that SMEs and students were indeed 'customers.' The respondent offered a clear distinction between the language of 'clients' or 'customers' by saying that he 'didn't use that [terminology]' but rather 'students and probably SMEs. Faculty, teachers, SMEs, terms like that, rather than clients or customers.' While somewhat supportive of the definition of 'customer' offered, their disagreement lay in a philosophical position 'between the nature of a teaching relationship and the nature of the relationship of a client or a customer to the person who is providing the service to their client or customer.' They did not 'think that that model works terribly well for universities or for teaching institutions generally. Teachers are in relationships to students; not to clients and it is a very different relationship than a client. In fact, students nowadays are mixing these two things up and they get into quite a lot of trouble because of it. And I think they undermine their own learning by doing that.'

E. Use of customer-oriented processes in university setting

- The following lists examples of customer-oriented processes within the pilot site. They have not been ranked or prioritized.
- Initial course proposal
- Instructional design
- Feedback / evaluations / focus groups
- Course revisions
- Technical issues: design, testing and issue resolution
- Management of pedagogical issues during running of course
- Participation in team meetings / brainstorming sessions
- Sample lesson creation leading to 'blue print' of course and preliminary course outcomes
- Ongoing negotiation during course development and production
- Contribution to clarity of project goals
- Requirement identification and confirmation
- Copyright management
- Content creation
- Government: grant funding
- Senior administration: funding for continuing education department
- Course approval

Variables affecting use of customer-oriented processes

F. Academic freedom

A central element affecting faculty member participation in the e-Learning project environment is their ability to exercise academic freedom and innovate in their chosen fields. It is a dimension of the working life within this community that impacts how the project management capability can fulfill its responsibilities. It requires a balance to be struck as it demands of people within the e-Learning course development environment to avoid being 'rather mechanistic and [not respect] the liberties that an academic is used to having in developing their teaching material.'

This particular project management environment has, a practice, tried to establish the parameters of a project at the beginning and encourage the course authors 'to throw everything on the table; everything you can think of because that's where the academic freedom comes in.' This freedom affects the working relationship that project managers have with individual course authors and their sponsoring faculty departments.

Academic freedom precludes project managers dictating content to faculty members. They may perceive this as a hindrance to their creativity and, depending on responses to direction, different faculty

may produce content differently. Courses must be developed with the project management team cognizant of the fact that they might have different pedagogical principles or styles (than the course authors). Ultimately, however, because of academic freedom, pedagogical decisions fall to course authors and shape those project management processes involving content development.

G. Various uncategorized factors

The following lists various factors identified in all interviews which affect the involvement of customers in project management activities. They have not been ranked or prioritized.

i. Costs of projects, Budgets
ii. Enrolment caps
iii. Target audience (affects/determines design)
iv. Feedback from evaluations
v. Return rates
vi. Different organizational elements
vii. Financial commitment level (affects government involvement), Budgets
viii. Depth of knowledge (by customers) of technology
ix. Appreciate of natural constraints by project management staff
x. Extent of distant education use (not everything ends up online)
xi. Changing of students familiarity and expectations re technology
xii. Changing demographics (decline 18-23 yr olds; increase in mature students)
xiii. University's mission
xiv. Learners' needs (homogeneous or varied)
xv. General interests (of students) versus professional needs
xvi. Technology access
xvii. Individual faculty use / awareness / experience of technology
xviii. Attitudes
xix. Trade-off between limited resources and feedback
xx. Potential impact of course on internal development and production cycles
xxi. Faculty understanding of project management availability
xxii. Relationships / getting to know project management staff
xxiii. Project management skills and personality
xxiv. Project management environment capabilities (e.g. equipped to involve or respond to customer involvement?)

xxv. Level of customer interest

xxvi. Commitment to teaching excellence

H. Attitudes, Inclinations and expectations

Of all factors coded under the heading 'Attitudes toward customer-oriented processes,' they are ranked in this order of frequency (based on number of references):

I. **Motivation to act based on proximity to customers**

Exposure to customers for project management staff can affect the motivations behind project management choices by those staff responsible for these decisions. Less exposure, access or proximity 'results in a greater emphasis on efficiency than effectiveness.' They believe they are doing their jobs in making that choice, but the result (from a project manager's perspective) is a disconnect insofar as making that trade-off between the effectiveness of the course material and the efficiency in making it is not the ideal and affects expectations, project outcome and quality.

J. **Loyalty to customers**

Loyalty is another issue identified that affects many elements of the management of the project. In the words of one project sponsor, 'project management staff need to be aware and understanding of customer loyalty.' As a working principle, staff need to determine 'if staff [they are] willing to give loyalty and, [if not] they need to question whether they want to be there or not.' Doing that involves making decisions that may bring multiple stakeholders from within the community into possible conflict. Resolving these issues that shows loyalty to the e-Learning project customers is essential.

Loyalty is an important dimension to the project management processes and culture as it affects the extent to which (and nature of) the customers' involvement in the project. They are thought of as 'co-participants or co-producers…not just as subject matter experts or customers.' It is quite clear from interviews with project management staff that the involvement of customers is rich with the promise of trust, respect and loyalty as staple elements of the inter-professional relationships.

K. **Trust**

The development of trust between project managers within the e-Learning PM office and customers was cited as a crucial element to the course development process at both the project manager and sponsor/director level. In describing their experiences in managing course development projects, they said trust became especially important for these team members 'once you've gone through two or three courses with people, [and] you do feel a level of trust developing.' This facilitates a more productive working relationship on individual courses and the broader office.

To illustrate the point, a project manager described the involvement of a course author who was at the office 'every day, working on various aspects of a course.' In doing so, the author receives direct encouragement and direction from project management staff and increases his understanding of the problems within the project. This greater awareness further allows project team members to be more responsive and expand their communication with other project customers (i.e., the sponsoring department). In the words of one project manager, a trusted customer can serve as a 'proselytizer.'

The operational effect of having trusted customers working on projects is that efficiency increases, and he/she 'may not have to come here next time…[but rather] we can just send him some files and we can go back and forth.' These individuals seem to strike a balance between being 'customers' and 'engaged'

collaborators who know that ‘your time is precious.’

Again, operationally, these trusted collaborators will proceed in such a way that they will respect the boundaries and processes of the project manager. They will offer to coordinate schedules, and offer to ‘set a couple of hours aside during the week which you will be working on the course anyway [to] do the brainstorming thing and try to establish the parameters for the project.’

In situations where less trust exists, customers/authors are seen to treat the course ‘[like] a manuscript and text script where you write 300 pages and you go there <SLAM> and they go away.’

Being ‘open and honest with the customer about their restraints and constraints [of a project]’ means that stress might occur, but ‘ultimately things will come together in the end anyway.’

L. **Traditional experiences of faculty**

Faculty experience with e-Learning is another factor that contributes to their attitudes toward these projects. some faculty members at the pilot site have been teaching for more than 30 years in areas that they argue, cannot be easily customized online. Beyond the conversion of content from classroom to online delivery, the attitudes of the faculty responsible for that conversion may contain suspicion of the new learning channel. Overcoming that suspicion and adjusting attitudes for the necessary project management activities is an issue in need of addressing by project management staff and the processes for which they are responsible.

M. **‘Being good enough’ / ‘Just have to get it done’**

From a manager's voice, the perspective was offered that sometimes the simple, basic need ‘ at the end of the day [to] just get the job done’ should drive project efforts. Endless cycles to consult or revise courses distracts team members--as they aim for perfection--and prevents courses from getting ‘into production...[and] off to students. Despite the belief that ‘there are dozens of courses where we could say, 'well, we should really fix that or we should have done that right', this manager would rather promote the idea that ‘you cannot ever be perfect and we have to get the courses, we have to get them done.’

‘There’s always so much more we could do but time just doesn’t do it. You have to say this is it. We could all. I am sure . But I guess a book that my supervisor wrote was about school districts and it was called Struggling to be Good Enough and I really think it applies to a lot of other things that we do. You know, you are working to be good enough.

N. **Expectations of school**

An example by an interview subject who had first-hand knowledge of the historical hiring practices of an older university started ‘from scratch’ with strict approaches to course development. (It was a tertiary institution started a number years prior but ultimately was incorporated with the pilot site university.) Teaching and learning had been delivered in mixed mode, some face-to-face instruction and some online. Faculty were hired with very clear instructions concerning course development: five templates were available and faculty were hired ‘on the basis of these expectations... This is how you will develop your courses.’ Employee candidates were further told that if they did not ‘want to do it that way, (then) don't join us.’

This example was offered in contrast to the pilot site where it 'can't do that because our institution wasn't developed with that expectation. [Faculty and staff] weren't hired that way.' So it has to be a negotiated process.

Several issues stem from the question of defining and enforcing expectations:

- The formal and informal activities of hired faculty and staff may differ if they believe they are free to operate and/or execute their job-related responsibilities in the absence of clear, defined instructions from management (the university in question).
- In an e-Learning project environment, this will require a 'negotiated process' where all contributing stakeholders and customers play a part.
- In the absence of templates, models or more defined elements that can contribute to the management of the e-Learning project, what processes can be followed that will ultimately, reliably and consistently allow project goals to be reached?

O. Speculation on the removal of customer-oriented processes

In response to a question concerning the impact of removing customer-oriented processes, respondents gave the following answers:

- Ultimately, the project management organization would disappear.
- Removal of students would allow project management staff to create courses any way they chose which probably wouldn't benefit students as much.
- Quality of materials would decrease dramatically
- Reputations would be negatively affected
- Copyright issues would go unsolved
- Efficiency of producing courses would trump their effectiveness
- Content inclusion from faculty and departments would disappear
- Content development efforts would be delayed
- Project outcomes couldn't be realized

Appendix #4: Sample project management documentation (Beta site)

Beta Project Plan Template

Executive Summary: Summarize the project scope; how it may build on previous work and why it's important.

Project Owner	[I'm not sure what project owner means]
Project Manager	
Project Team: specify roles, including partners outside of the unit	• • • •
Project Deadline: expected completion date	

Project Need
In this section, detail how this project aligns with the Unit's vision and core mandate and describe objectives.

Goals	
Objectives	• •

	• •
Alignment with Unit Mandate	
Project Scope	
Strategies: Describe how goals will be achieved.	• • • •

Environmental Scan: Why is the project important?

Stakeholder Analysis: List key stakeholders that will be interested in the project outcomes and may be affected by them. Answer these questions: What is the impact of the project? Who cares about it?		
Stakeholder Group	Issues/Perspectives	Impact/Influence

Risk Analysis: List factors that could pose a risk to the project's success, assess their likelihood and severity, and how they will be either prevented or managed.		
Risk	Probability	Severity

Resource Requirements: Provide a detailed breakdown of the time expectation for each project team member. Details for non-people resources (e.g. hardware/software, travel) can be included as a line item in the project budget.		
Team Member	Task	Time

Timeline: List high-level milestones.		
Task	Responsibility	Deadline

Budget		
Item	Quantity/Time	Notes

Evaluation: Indicate how the quality of the project and its success will be evaluated. List the factors that will be evaluated, questions that will be answered and methods that will be used.

Success Measures: What are the success measures?

Sustainability: Describe how this project, if appropriate, will transition into a service. Also provide a justification of whether this project should be built into a service.

Communication: How and when will the status of the project be communicated to team members, stakeholders?

Privacy/Security Considerations: Indicate type of data being managed and privacy considerations