The Role of Tacit Knowledge in Knowledge Intensive Project Management

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ABSTRACT

The traditional doctrine of project management, having evolved from operations management, has been dominated by a rationalist approach in terms of planning and control. There is increasing criticism that this prescriptive approach is deficient for the management of dynamically complex projects which is a common characteristic for modern-day projects.

In response to this and the relative lack of scholarly literature, this study uses an emergent grounded theory design to discover and understand the softer, intangible aspects of project management.

With primary data collected from twenty semi-structured personal interviews, this study explores the lived experiences of project practitioners and how they 'muddle through' the complex social setting of a knowledge intensive financial services organisation.

The model which evolved from the research portrays the project practitioner as being exposed to multiple cues, with multiple meanings around five causal themes: environmental, organisational, nature of the task, role and knowledge capability.

In response to these cues, the practitioner reflects upon their emotions and past experiences in order to make sense of the uncertain situation to determine their necessary course of action. As a coping strategy the project practitioner takes on the role of bricoleur, by making do by applying combinations of the resources at hand, in order to facilitate the successful delivery of their projects.

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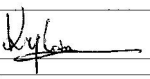
Signature of Candidate:		Date:	29 March 2017

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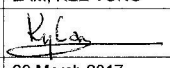
Signature of Individual Submitting:	
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DEFINITION OF TERMS

The following are the definitions used in the current study, where each term is expanded upon or cited in order to support its justification.

Boundary spanning: 'actions undertaken so as to establish linkages and to manage interactions with parties within the external environment' (Marrone, 2010, p. 914).

Bricolage: 'making do by applying combinations of the resources at hand to new problems and opportunities' (Baker & Nelson, 2005, p. 333).

Communities of practice: 'groups of people informally bound together by shared expertise and passion for a joint enterprise' (Wenger & Snyder, 2000, p. 139).

Dynamic capability: 'a learned and stable pattern of collective activity through which the organization systematically generates and modifies its operating routines in pursuit of improved effectiveness' (Zollo & Winter, 2002, p. 340).

Explicit knowledge: can be expressed in words and numbers, and easily communicated and shared in the form of hard data, scientific formulae, codified procedures or universal principles. Thus knowledge is viewed synonymously with computer code, a chemical formula or a set of general rules. (Nonaka & Takeuchi, 1995, p. 8).

Global systemic importance: measured in terms of the impact that a failure of a bank can have on the global financial system and wider economy. There are five equally weighted indicators of systemic importance based upon: size, cross-jurisdictional activity, interconnectedness, substitutability and complexity (Basel Committee on Banking Supervision, 2011).

Improvisation (organisational): 'the degree to which the composition and execution of an action converge in time' (Moorman & Miner, 1998, p. 698) and consists of a combination of bricolage, creativity and intuition.

Knowledge: '…a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of knowers. In organisations, it often becomes embedded not only in documents or repositories but also in organisational routines, processes, practices, and norms' (Davenport & Prusak, 1998, p. 5).

Knowledge capability: the ability to utilise knowledge assets to acquire, create, transfer, exploit and protect knowledge through knowledge processes (Gold et al., 2001; Lee & Choi, 2003; Tanriverdi, 2005).

Knowledge culture: 'A way of organizational life that enables and motivates people to create, share and utilize knowledge for the benefit and enduring success of the organization' (Oliver & Kandadi, 2006, p. 8).

Knowledge infrastructure: '…a comprehensive ICT [information and communication technologies] platform for collaboration and knowledge sharing…that fosters the implementation of KM [knowledge management] instruments in support of knowledge processes targeted at increasing productivity of knowledge work' (Maier et al., 2005, p. 73).

Knowledge intensive companies: where most work can be said to be of an intellectual nature and where well-educated, qualified employees form the major part of the work force (Alvesson, 2000; Nurmi, 1998; Starbuck, 1992).

Project: 'a temporary endeavour undertaken to create a unique product, service or result' (Project Management Institute, 2013a, p. 1).

Project complexity: '…"consisting of many varied interrelated parts" and can be operationalized in terms of differentiation and interdependency' (Baccarini, 1996, p. 202).

Project complexity (pattern of): 'The minimum manageable context of complexities within a project…[and] is built up of an interrelated and dynamic set of characteristics of complexities' (Geraldi & Adlbrecht, 2007, p. 33).

Reflection: 'the practice of periodically stepping back to ponder the meaning to self and others in one's immediate environment about what has recently transpired' (Raelin, 2001, p. 11).

Systemically important financial institutions (SIFIs): 'whose disorderly failure, because of their size, complexity and systemic interconnectedness, would cause significant disruption to the wider financial system and economic activity' (Financial Stability Board, 2010).

Sociability: 'the measure of emotional, non-instrumental relations (those in which people do not see others as a means of satisfying their own ends) among individuals… [i]n its pure form, sociability represents a type of social interaction that is valued for its own sake. It is frequently sustained through continuing face-to-face relations characterized by high levels of unarticulated reciprocity' (Goffee & Jones, 1996, p. 134).

Tacit Knowledge: 'highly personal and hard to formalise, making it difficult to communicate or to share with others. Conclusions, insights and subjective hunches fall into this category of knowledge. Furthermore, tacit knowledge is deeply rooted in an individual's action and experience, as well as the ideals, values, or emotions he or she embraces' (Nonaka & Takeuchi, 1995, p. 8).

Tie strength: 'the strength of a tie is a (probably linear) combination of the amount of time, the emotional intensity, the intimacy (or mutual confiding), and the reciprocal services which characterize each tie' (Granovetter, 1973, p. 1361).

Trust: 'the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party' (Mayer et al., 1995, p. 712).

Whistle-blowing: 'the disclosure by organization members (former or current) of illegal, immoral or illegitimate practices under the control of their employers, to persons or organizations that may be able to effect action' (Near & Miceli, 1985, p. 4).

CHAPTER 1. INTRODUCTION

1.1. Background to the Study

Project management as a theoretical discipline is relatively young, evolving with the development of network planning techniques back in the 1950s (Oleary & Williams, 2013; Packendorff, 1995; Shenhar & Dvir, 2007b). This has led to the discipline being dominated by a rationalist approach in terms of planning, organising, resource allocation and the control of costs and schedule (Cavaleri & Reed, 2008; Oleary & Williams, 2013; Winter, Smith, et al., 2006).

There is prolonged debate on whether the traditional rationalistic approaches are still valid for modern-day projects (Chipulu et al., 2013; Partington, 1996; Seely, 2001) where Cavaleri and Reed (2008, p. 73) argue that more than half of all major projects may be described as 'dynamically complex' and can be more effectively managed through a combination of hard and soft approaches.

Muzio et al. (2007) identified that 90–95 percent of documented performance issues are concerned with soft skills and despite it being argued that soft competences contribute more to project success than technical activities, it still has received little attention (Skulmoski & Hartman, 2010).

The benefits of knowledge transfer and learning across projects to optimise investment value and positively influence an organisation's long-term success has been widely supported (Pemsel & Wiewiora, 2013; Reich et al., 2014; Todorović et al., 2015). However, in reality project practitioners concentrate more on project-based activities and neglect cross-boundary knowledge-sharing practices (Mueller, 2015; Swan et al., 2010).

This grounded theory study is conducted in response to the relative lack of scholarly literature researching the softer, intangible aspects of knowledge intensive project management and aims to contribute to the lived experience of projects literature.

The intent of this emergent grounded theory research design was to discover how project practitioners 'muddle through' the complex and sometimes messy scenarios encountered in their project environment within a knowledge intensive financial services organisation.

1.2. Significance of the Problem

The UK Government-funded research network (2004–2006), called *Rethinking Project Management*, was formed in response to the increasing criticism of project management theory and the need for 'enriching and extending the subject of project management beyond its current conceptual foundations' (Winter, Smith, et al., 2006, p. 638). One of the major themes which emerged was the fact that projects and programmes, in practice, are much more complex, unpredictable and multidimensional than the rational, deterministic model which is employed in the literature (p. 644).

Koskela and Howell (2002) argue that the traditional doctrine of project management is based on a deficient foundation where there is a disconnect between theory and practice. The conventional emphasis on planning and control with respect to the project plan (Williams, 2005) may augment problems for projects which are 'structurally complex, uncertain, and heavily time-limited' (p. 10) and may also translate into counter-productivity and self-inflicted problems which undermine performance metrics (Koskela & Howell, 2002).

Explicit knowledge as portrayed in the formal, mechanistic project management bodies of knowledge, e.g. the Project Management Body of Knowledge (PMBOK® Guide) from the Project Management Institute (PMI), is often said to be based on a 'lack of underlying theory' (Williams, 2005, p. 500) and 'appear[s] to have no underpinning research basis' (Shepherd & Atkinson, 2011, p. 153). It is posited that it has limitations in a practice-based area of project management where increased emphasis should applied to 'know-how' and the need for 'craft' i.e. tacit knowledge (Koskinen, 2004; Morris et al., 2006).

There is a need to understand the 'actuality' or the 'lived' experience of project actors (Cicmil et al., 2006; J. Thomas & Mullaly, 2008) whose working environment is regarded as a 'complex social setting characterised by tensions between unpredictability, control

and the collaborative interaction among diverse participants' (Cicmil et al., 2006, p. 676). The 'organisational reality is seen as messy, ambiguous, fragmented and political in character' (p. 678). It is still claimed that there is a lack of literature which captures the 'lived experience' of projects from a personal and contextual perspective (van der Hoorn, 2015) and the formal and informal practices which project practitioners actually employ to influence project outcomes (Oleary & Williams, 2013).

Researching the topic of intangibles raises the problem of subjectivity. There is a need to examine any of the assumptions made in previous research to understand if there was, or still exists, a plausible interpretation. Alternative interpretations may also emerge given newly discovered knowledge or insights.

It is hoped that identification of the 'softer' and 'intangible' side of projects will facilitate the argument for a return of investment in undertaking projects where the focus would be on the delivery of value, rather than on adhering to traditional measures such as time, cost and scope. Awareness of such characteristics offers development opportunities for project practitioners regarding skills of a softer nature, which have been identified as attributive to the delivery of increased project value.

1.3. Purpose of the Study

Historically, positivism has been dominant in research on projects (Smyth & Morris, 2007; van der Hoorn & Whitty, 2015) which has seen a growing concern with the widening gap between theory and practice (Bredillet, 2010; Oleary & Williams, 2013). This research hopes to provide a platform to increase the use of interpretative research methodologies to further probe and gain deeper insights into the lived experiences of project practitioners.

It has been recognised that knowledge – both explicit and tacit – is fundamental to our understanding of project management. We need to learn within and across projects in order to develop the capability to manage such knowledge, which is a major contributor to maximising value from project management and providing organisational competitive advantage (Bakker et al., 2011; Newell et al., 2006; Prencipe & Tell, 2001).

It has been posited that the influence of social processes on project management still lacks understanding (Floricel et al., 2014) and there is a relative lack of literature on how best to coordinate the soft and intangible aspects of project management (Azim et al., 2010; Cavaleri & Reed, 2008).

The background literature review indicates there is an evolution from traditional prescriptive and control project management methodologies to one where there is an increasing awareness of and interest in understanding the softer and more tacit aspects of knowledge intensive project management.

The purpose of this emergent grounded theory research design is to gain a better understanding of the lived experience of project practitioners, and how they 'muddle through' the complex, unpredictable and sometimes messy scenarios encountered in their project environment of a knowledge intensive organisation (KIO).

The focus of this research takes an explorative approach to investigate and understand the role of tacit knowledge for project practitioners in a multinational financial services institute. Using grounded theory building, questions were explored with reference to the inductive, case-orientated process as described by Eisenhardt (1989).

The following questions guided the intent and direction of the study:

- What knowledge is perceived to be important for delivering successful projects?
- What role (and when) does project practitioners' tacit knowledge play in overcoming or improving situations at hand?
- What strategies are undertaken by project practitioners to compensate for lack of knowledge?

The study involved a continuous zigzag interaction between the literature (section 2.2 and section 2.3), data collection (section 4.3) and data analysis (section 5.1 and section 5.2) in order to examine participants' experiences as expressed through their own voices. The zigzag process, also known as the constant comparison method (Glaser & Strauss, 1967) is illustrated in table 4.1 where the data analysis was performed by implementing the

'coding paradigm' as depicted by Corbin and Strauss (1990, p. 13). This paradigm facilitates the identification of the causal and contextual conditions leading to a central phenomenon (section 5.3) and the consequences of various interactions on the phenomenon.

1.4. Assumptions

The following assumptions were taken into consideration with respect to the research study on the understanding they could influence data collection and analytical implications:

- The research overview and procedures outlined to participants to express the measures taken to ensure confidentiality and anonymity gave them the necessary assurance to enable them to provide authentic and open responses.
- The time available for interviews was sufficient for participants to provide relevant research data.

1.5. Delimitations

This research delimited the study population comprised of project management practitioners within a global SIFI. SIFIs are described as institutions 'whose disorderly failure, because of their size, complexity and systemic interconnectedness, would cause significant disruption to the wider financial system and economic activity' (Financial Stability Board, 2010). With the single case study organisation being classified as 'too big to fail' (Financial Stability Board, 2010, 2015), it is believed that an organisation of this size and complexity would present enough challenges and sufficient data to provide meaningful analysis and recommendations.

The selection of project practitioners, who willingly gave consent, ensured the participation of knowledge workers as respondents into this study of a KIO.

The target population was approximately twenty project practitioners with a minimum of five years project-related experience. The research study did not consider differences in race or gender amongst the research participants.

1.6. Limitations

This research was undertaken with a study population that comprised of project management practitioners within a financial services organisation. One of the main limitation concerns is the 'small' sample size and whether the sample respondents are representative of the organisation, and also whether the organisation is representative of KIOs.

Other limitations which may influence the study are indicated below:

- sample size of research participants impacts the generalisation of the data;
- time available to conduct interviews;
- honesty and respondent subjectivity may not accurately reflect true representation of participants' experiences and emotions;
- inherent limitations of the research methodology chosen, i.e. grounded theory;
- recording of any group facilitation techniques used is unable to capture the full essence of the event, due to the interactivity and low quality of recording.

1.7. Outline of the Thesis

This dissertation consists of six chapters as described below.

Chapter 1, as an introduction, provides some background information and discusses the significance and purpose of the research.

The literature review is located in Chapter 2 and gives an overview of the relevant literature that informs this exploratory research in the domain of project knowledge management. It illustrates the key concepts, theories, definitions and literature that may be relevant to the research area.

Chapter 3 presents the research design, and covers the research setting and participants.

Chapter 4 covers the research methodology, providing an overview of the history and forms of grounded theory building. This chapter also includes details on how data was collected and analysed taking into consideration questions of researcher bias and ethics. The results of the data collection and analysis are presented in Chapter 5. This also includes the emergence and introduction of the central phenomenon as well as the model building which transpired.

Chapter 6 presents a discussion of the findings and the contributions to knowledge from a theoretical and practical perspective. The study concludes with a discussion on the limitations of the research as well as some suggestions for future research.

CHAPTER 2. LITERATURE REVIEW

2.1. Introduction

This chapter provides an overview of the relevant literature that informs this qualitative, phenomenological research study to investigate the working practices of project practitioners and their use of tacit knowledge to deliver projects in their working environment.

The literature review was undertaken in order to determine if sufficient material and supporting theory existed for the concerned area of research, i.e. knowledge in projects. A preliminary literature review was undertaken to validate the context, determine any missed areas of significance and to keep the author attuned to any emerging themes.

Further to a preliminary literature review on project and knowledge management (KM), the author performed a brief search on the two dominant project management (PM) academic journals, i.e. International Journal of Project Management (IJPM) and Project Management Journal (PMJ) as available from the Heriot Watt University off-campus access. The search was on the occurrence of the word 'intangible' from January 2005 to May 2015. It is acknowledged that intangibles may be operationalised in projects in different ways without the use of the word and hence the results shown below are only indicative.

	2015	**2014**	**2013**	**2012**	**2011**	**2010**	**2009**	**2008**	**2007**	**2006**	**2005**	**Total**
IJPM	15	19	11	11	11	10	9	9	11	5	5	**116**
PMJ	3	4	8	13	5	5	5	7	2	3	3	**58**
Total	**18**	**23**	**19**	**24**	**16**	**15**	**14**	**16**	**13**	**8**	**8**	**174**

Table 2.1: Literature search on 'intangible'

The results show a steady output of research concerning the intangibles of PM over the last ten years, with an increase since 2007. This signifies a continued interest in understanding the proposed topic. A text search on 'know how', the intangible resource

which results in distinctive competences (Hall, 1992), was also performed, but this was not conclusive.

It was identified that 'know how' was spelt in different ways in different articles, e.g. 'knowhow' and 'know-how' and hence this would become quite time consuming to filter accurately. A word search was then performed for 'tacit knowledge' which produced the results below. Similar to the text search on 'intangibles, this showed a generally steady and increased interest with regards to tacit knowledge in projects over the last ten years.

	2015	**2014**	**2013**	**2012**	**2011**	**2010**	**2009**	**2008**	**2007**	**2006**	**2005**	**Total**
IJPM	17	17	18	10	10	8	9	12	9	11	9	**130**
PMJ	8	9	8	8	15	11	6	4	6	9	2	**86**
Total	**25**	**26**	**26**	**18**	**25**	**19**	**15**	**16**	**15**	**20**	**11**	**216**

Table 2.2: Literature search on 'tacit knowledge'

This literature review is organised into two main sections. The first section reviews and discusses the PM literature with respect to its relationship with organisational strategy, project types and complexity. This also includes a review of the project practitioner role and aspects of the necessary competences sought.

The second section concerns the literature regarding knowledge and its various forms. This is reviewed in consideration with the knowledge that is available in projects and the organisation, as well as that required by the project practitioner in order to maximise value from the project outcome.

2.2. Project Management

Project management as a theoretical discipline is relatively young, evolving with the development of network planning techniques back in the 1950s (Oleary & Williams, 2013; Packendorff, 1995; Shenhar & Dvir, 2007b). This has led to the discipline being dominated by a rationalist approach in terms of planning, organising, resource allocation

and the control of costs and schedule (Cavaleri & Reed, 2008; Oleary & Williams, 2013; Winter, Smith, et al., 2006).

There is prolonged debate on whether the traditional rationalistic approaches are still valid for modern-day projects (Chipulu et al., 2013; Partington, 1996; Seely, 2001) where Cavaleri and Reed (2008, p. 73) argue that more than half of all major projects may be described as 'dynamically complex' and can be more effectively managed through a combination of hard and soft approaches. Turner (1996, p. 6) states that PM can be described as 'the art and science of converting vision into reality'.

The hard, rational approach, which is taken by most PM text books and methodologies has been criticised for treating all projects the same, and not providing enough emphasis on the soft, human behavioural issues (Winter, Smith, et al., 2006). Azim et al. (2010) emphasise this concern by postulating the increasing realisation of how people issues affect project complexity and the direct influence on project outcomes.

Similarly, Koskela and Howell (2002) argue that the traditional doctrine of PM is based on a deficient foundation where there is a disconnect between theory and practice. The conventional emphasis on planning and control with respect to the project plan (Williams, 2005) may augment problems for projects which are 'structurally complex, uncertain, and heavily time-limited' (p. 10). This may also translate into counter-productivity and self-inflicted problems which undermine performance metrics (Koskela & Howell, 2002).

Explicit knowledge as portrayed in the formal, mechanistic PM bodies of knowledge, e.g. the PMBOK® Guide from the PMI, is often said to be based on a 'lack of underlying theory' (Williams, 2005, p. 500) and 'appear[s] to have no underpinning research basis' (Shepherd & Atkinson, 2011, p. 153). It has limitations in a practice-based area of PM where the importance of 'know-how' and the need for 'craft', i.e. tacit knowledge, is asserted (Koskinen, 2004; Morris et al., 2006).

The above discussion illustrates the traditional PM practice with a strong influence on a hard paradigm and the increasing support for a move towards a soft paradigm. This soft

paradigm which emphasises learning, social processes and the role of the project manager as facilitator is presented by Pollack (2007, p. 267) as below.

Hard Paradigm	**Soft Paradigm**
Predefined goals – the existence of a pre-existing business plan with clearly defined goals and constraints and clear customer requirements.	Ill defined, ambiguous goals.
Project manager as expert – strong emphasis on a centralised, efficient, expert-led delivery.	Project manager as facilitator – emphasis on interpersonal matters and participation.
Emphasis on control – project planning, scheduling and control. Assumes a more detailed plan allows for tighter control.	Emphasis on learning – plans need to be flexible enough to facilitate the incorporation of new ideas, new developments and changes in direction.
Quantitative measures – focus on objective performance measures.	Qualitative measures – subjective.
Emphasis on organisational structure.	Emphasis on social process – understanding the social process in the situation, and overcoming any obstacles preventing stakeholders reaching the agreement necessary to initiate project work.
Positivists and realist philosophies – focus on objectivity and the assumption of a stable and equally accessible reality.	Interpretivist philosophies – inductive reasoning, and exploratory, qualitative techniques, which emphasise contextual relevance rather than objectivity.
Tools and techniques are predominantly quantitative, e.g. work breakdown structure (WBS), network, critical path analysis.	Tools and techniques based on experience and practice, e.g. stakeholder engagement, facilitate and structure debate, help people learn each other's perspectives on the situation.

Table 2.3: Attributes of the hard and soft paradigms. Adapted from Pollack (2007)

2.2.1. Project Success

There is extensive PM literature regarding success factors as well as causes of failure in a diversity of industries. Discussions on project success are frequent and ongoing, but there is no commonly agreed definition (Hyväri, 2006; Jugdev & Müller, 2005; Müller & Jugdev, 2012; Shenhar & Levy, 1997).

As this research debates the traditional PM bodies of knowledge, we present the definitions as quoted from the two major PM accreditation bodies. The International Project Management Association (IPMA, 2006) defines project success as 'the appreciation by the various interested parties of the project outcomes' (p. 16), and PM success as 'the appreciation of the project management results by the relevant stakeholders' (p. 40). The Project Management Institute (PMI, 2007) acknowledges that the term 'project success' has 'a number of connotations' (p. 50) and defines it as a 'collective assessment by project stakeholders of the degree to which the project has achieved each of its objectives' (p. 75).

Project management success has been regarded as the traditional process-driven metric of project completion based on cost, time and quality (Atkinson, 1999; Ika, 2009; Oya Icmeli & Walter, 2001). However, Serrador and Turner (2015) contend that these metrics are not a comprehensive measure of project success as it should be measured upon how stakeholders regard the project as meeting its strategic objectives. Artto et al. (2008) contend the traditional success metric by positing that project success concerns how the project is able to accomplish its goals that will be assessed by stakeholders who may have differing or conflicting criteria.

A project's success criteria will need to take into consideration the variation of organisational context such as project type, characteristics, organisational maturity and stage in the project life-cycle (Artto et al., 2008; Pinto & Prescott, 1988; PMI, 2007).

Acknowledging that different stakeholders assess project success differently and at different times during the project, Shenhar and Levy (1997) propose a multidimensional universal framework to assess project success along four distinct dimensions: project

efficiency, impact on the customer, direct and business success, and preparing for the future.

The view on project success has changed over the years (Geoghegan & Dulewicz, 2008; Müller & Jugdev, 2012; Todorović et al., 2015). Performing a retrospective analysis on the PM literature, Jugdev and Müller (2005) identifies four periods from the 1960s to the 21st century whereby definitions have extended from the implementation phase of the project to cover the whole product life-cycle, and to include product and business success.

There appears to be a growing consensus that project success involves two main aspects: those of efficiency and effectiveness (Ika et al., 2012; Serrador & Turner, 2015). Efficiency refers to meeting cost, time and scope objectives, and effectiveness concerns the extent to which the project meets the overall objectives. Measures of effectiveness tend to be intangible, more difficult to determine than those of efficiency, and may take longer to be realised (Müller & Jugdev, 2012).

2.2.2. Projects as Strategy

Organisations are increasingly realising that corporate strategy is delivered through projects (Artto et al., 2008; Crawford et al., 2006; Shenhar & Levy, 1997) and that PM capability is key to their ability to deliver their strategic intent (Turner, 1999). Cooke-Davies et al. (2009) cite studies which support their assertion that projects should not be simply regarded at an operational level since projects may have an influence on the organisational strategy.

Poli (2006, p. 127) defines project strategy as 'the perspective and guidelines on ''What'' to do and ''How'' to do it to achieve the highest competitive advantage/value and the best project results'. Building on Porter's (1985) Generic Strategies, Poli (2006, p. 127) presents four generic project strategies to create competitive advantange with project deliverables as follows:

- Cost advantage – through low cost to customers. These can then be categorised into:

    - external projects which focus on revenue production through the development of products and services, and
    - internal projects which aim to achieve lower cost within a company's value chain by cost reduction, efficiency, effectiveness, responsiveness and process improvement;
- Customer focus – niche projects and focuses to achieve enhanced customer intimacy.
- Product advantage – focus on creating products and services with superior quality, performance, functionality, design or new technology.
- Time advantage – by being first to market, or by a customer/regulatory-imposed time constraint.

Also from a strategic viewpoint, Pavlicko (2007) looks at return on investment project types – those that an organisation may want to implement for reasons of marketing its services or growing its business – and concludes that the project outcomes may not necessarily be traceable by financial analysis. During the investigation into the success of information systems technology projects, three project types were categorised (p. 68):

- At risk – mandatory projects, for example those related to safety, liability and regulatory mandates;
- Infrastructure – implementation need to ensure the continued operation of the business at a given level of service;
- Strategic – the need to implement for any number of reasons not identified above.

Project-based work and PM have extended into sectors and contexts beyond traditional project-orientated industries such as construction, defence, and aerospace (Thomas, Cicmil, et al., 2012; Whitley, 2006). Projects have been depicted as the means to produce and deliver new products (DeFillippi & Arthur, 1998; Wells, 2012), promote innovation (Salunke et al., 2011; Thomas, Cicmil, et al., 2012) and manage change (Cicmil, 1999; Clarke, 1999) in uncertain and knowledge intensive business environments.

In a project-based environment, the combination of the PM and learning process to produce a product to satisfy stakeholders' needs is a core competency (Kotnour, 1999). Project-specific, knowledge-based competencies enable an organisation to adapt and cope

with competitive challenges (DeFillippi & Arthur, 1998) where 'the knowledge, capabilities, and resources of the firm are built up through the execution of major projects' (Hobday, 2000, p. 875). There is, however, an ongoing need for organisations to build knowledge from experience (Kotnour, 1999) and across projects (Newell & Edelman, 2008).

2.2.3. Project Types and Complexity

Despite it being argued for over twenty years that different types of projects should be treated differently (Packendorff, 1995; Shenhar, 2001; Shenhar & Dvir, 1996; Turner & Cochrane, 1993) with different theories (Packendorff, 1995; Partington, 1996), most popular PM literature still assumes that all projects are basically the same and that all types of project work can be governed by the same PM theory (Andersen, 2006; Winter, Smith, et al., 2006).

A Guide to the Project Management Body of Knowledge (PMBOK® Guide)(Project Management Institute, 2013a), was first published in 1996 and has over 5 million copies (all editions, including translations) in circulation (PMI, 2015). It has been providing general guidelines for better PM since then and has been regarded as 'the global de facto standard for those engaged in project management' (Starkweather & Stevenson, 2011, p. 31). Despite this, it has been criticised for not distinguishing between different types of projects (Dvir et al., 2006; Packendorff, 1995). The PMI itself also recognises that PM practices vary significantly across industries since they maintain almost forty communities of practice (PMI, 2015) and publish the construction, government and software extensions of the PMBOK® Guide (Project Management Institute, 2006, 2007, 2013b).

Turner and Cochrane (1993) posit that the traditional view of projects as a complex, but well-defined, series of tasks delivering clearly understood goals and objectives may be inappropriate for the majority of projects. They introduce the element of uncertainty and posit that projects can be judged to include: how well defined are the goals, and how well defined are the methods of achieving them. Their model, the 'Goals and Methods' matrix, implies four types of projects and is illustrated below (pp. 94-95).

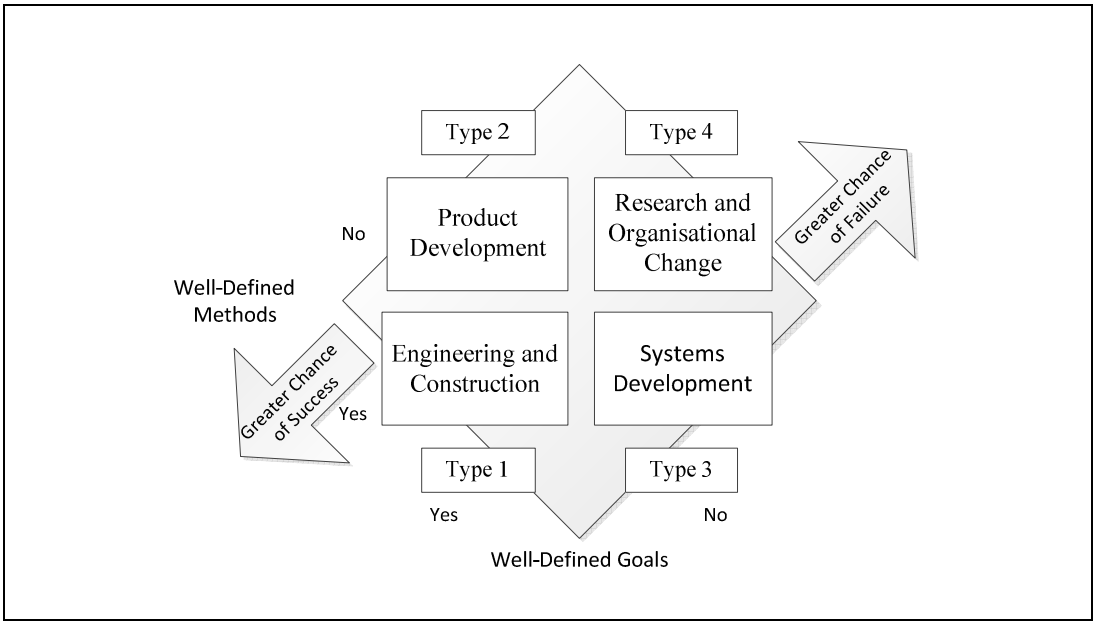

Figure 2.1: Goals and methods matrix (Turner & Cochrane, 1993)

Project	Goal and Methods Definition	Project Management Approach
Type 1	Well-defined goal and methods (engineering and construction projects).	Task- and activity-based approaches to planning. The basis of much of the traditional project management literature.
Type 2	Well-defined goal, poorly defined methods (product development projects).	Milestone-based approach to planning, whereby milestones denote components of the final product.
Type 3	Poorly defined goal, well-defined methods (system development projects).	The planning approach tends to be based around the project life-cycle.
Type 4	Poorly defined goal and methods (research and organisational change projects).	Tend to be managed as type 2 or type 3 projects according to nature. Research projects tend to be managed through the life-cycle whereas organisational change projects tend to be managed through a product-based milestone plan.

Table 2.4: Goals and methods definition and project management approach (Turner & Cochrane, 1993)

Supporting the argument that there is considerable variation amongst projects, Shenhar and Dvir (1996), in their study of technical and engineering-based projects, classified projects into four levels of technical uncertainty and three levels of system complexity.

This two-dimensional model, given the amount of technological change and variation among projects, was expanded into a three-dimensional (uncertainty, complexity, pace) framework, known as the UCP Model and then further refined into the NCTP 'Diamond' Model. The NCTP model consists of novelty, complexity, technology and pace (Shenhar & Dvir, 2007a, p. 183) as illustrated and described below.

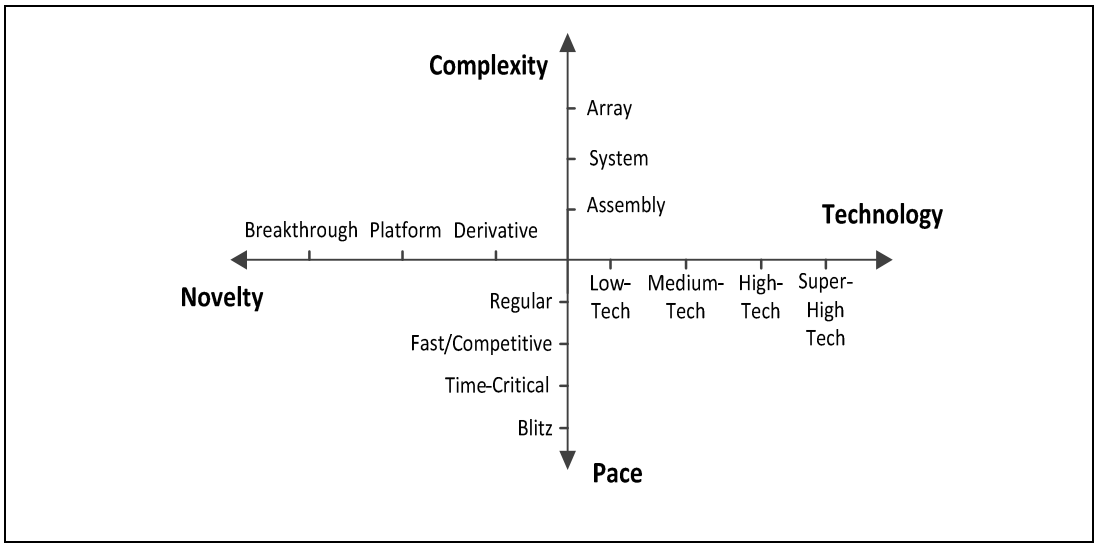

Figure 2.2: NCTP 'Diamond' Model (Shenhar & Dvir, 2007a)

'Novelty' refers to the product and how new it is to the market. It concerns the familiarity, usage and benefits to the customer. Shenhar and Dvir (2007a, p. 183) utilise the major product categories as suggested by Wheelwright and Clark (1992) in their model:

- Derivative – improvement of an existing product;
- Platform – new generation of existing product;
- Breakthrough – new-to-the world product.

'Complexity' basically refers to the system scope and is depicted in a hierarchy where the lower levels may be considered as a subsystem to the next higher level:

- Array – concerns the combination of a widely dispersed collection of systems to function towards a common objective;
- System – involves a collection of components bound to form a wide range of functions;

- Assembly – components combined to form a single unit performing a single function.

'Technology' is associated with the degree of using known technology and can be classified into four levels:

- Low-tech – existing and well established technologies;
- Medium-tech – combining mainly existing technologies with new features or technology;
- High-tech – mainly new but with existing technology;
- Super-tech – new technology with undefined method of goal achievement.

'Pace' concerns the urgency of the project, available timeframe and the consequence of not meeting the time constraints:

- Regular – time is not critical but is intended for long-term achievements;
- Fast-competitive – most common projects, where time to market is associated with market opportunities and competitiveness;
- Critical-blitz – time critical and often associated with a crisis or unexpected event.

Shenhar and Wideman (2002, p. 2) state 'For a project to be successful, different types of project work, associated with different types of product, need to be managed differently'. They posit that the outcome of a project may be in a tangible form such as infrastructure or a product, or conversely in an intangible form that comes from intellectual property value.

Further to the nature of the product, there is a need to understand the nature of the work involved. Shenhar and Wideman (2002) describe craft skills as being attained from training and which can be improved by repetition. They also discuss intellectual skills which is the application of experience and training to explore, solve problems and manage complex relationships. They present project classification in the form of a 'Type of Work' against 'Type of Product' matrix as illustrated below.

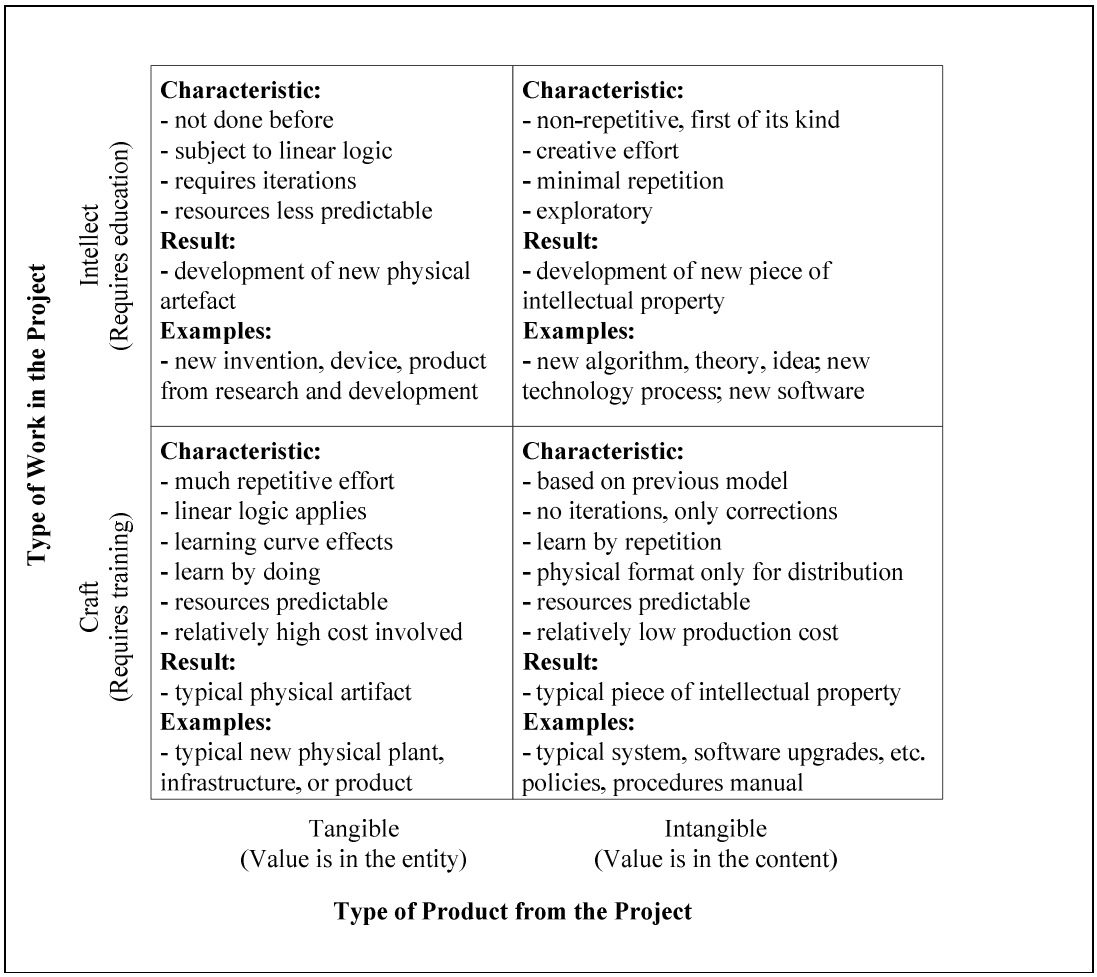

Figure 2.3: 'Type of Work' against 'Type of Product' project classification (Shenhar & Wideman, 2002)

In order to carry out the research, we need to define the object of study. The research looks to investigate the various project knowledge-building practices being utilised within a financial services organisation. However, it is recognised that even within the same organisation, there are different categories or types of project. Using a web-based questionnaire to determine the leadership styles of 400 project managers, Müller and Turner (2007) identified that different project managers' leadership styles have a different impact on the likelihood of a successful outcome. They took into consideration six project types to include: application area, contract type, complexity, culture, life stage cycle and strategic importance.

The above commentary regarding project types and categories demonstrates the uniqueness of projects and how difficult it is to classify them. Koskinen et al. (2003) assert that projects can be classified into different categories depending on the need to use explicit or tacit knowledge:

- Projects where the goals are not well defined at the outset, and hence the method to achieve them is also unclear, usually indicate the use of tacit knowledge being critical. This may include research, development and design projects.

- Projects where the goals are well defined, and hence the methods used to achieve them are also more defined, indicate the use of explicit knowledge being dominant. Examples of this type of project may include delivery and investment projects.

With respect to project categorisation for financial institutions, Crawford et al. (2005) investigated two cases. For the first case, a mutual bank with 40,000 employees, projects were classified into one of the following five categories (p. 102):

1. strategic positioning projects that define strategy and are then implemented through projects of one of the four other types;
2. projects to develop business solutions;
3. projects to reconfigure the distribution network;
4. specialised development projects whose deliverables are concentrated in one specialised domain;
5. projects that are internal to the bank's headquarters.

Most of the projects in categories 1, 4 and 5 took a de-centralised approach, and were managed directly by the individual departments. Projects in categories 2 and 3, which were large (more than US$200,000 or 30 man-months) and have significant strategic implications and impact, were managed by a central PM unit.

The bank moved towards the development of a centralised programme and portfolio management process and the change, illustrated below, to a three-level project categorisation system based on source of funding, size and strategic impact (p. 103).

	Major Strategic Initiatives	**Other Development Projects**	**System Evolution and Major Maintenance Projects**
Funding	Development	Development	Operational
Size (US$)	More than $8m	$400k–$8m	Up to $400k
Strategic Impact	Very high	High to moderate	Low

Table 2.5: Research organisation project categorisation system (Crawford et al., 2005, p. 103)

The other case study by Crawford et al. (2005) involves a private bank, which employs nearly 80,000 people. In this case, all projects had to be categorised in order to assign priority, funding and human resources. Project categorisation concerned the following labels (p. 133):

1. mandatory, responding to legislation;
2. business strategic;
3. business critical;
4. level of technology;
5. business division;
6. complexity, i.e. single or across departments.

With regards to this research and the organisation under study, different categories of projects are evident. As an example, for the Technology department, the two project categories are:

1) 'Change the Bank' projects consisting of activities to add functionality, and value, to their processing. These were transitory pieces of work and consisted of:
   - Investment projects – projects that provide new functionality to the business, or materially affect the financial reporting of the bank, or have an impact on an

approved group standard, or use a technology that is not an approved group standard technology;

- Major investment projects – projects that cost US$100k or more; or take ten man-months or more to complete;
- Minor investment projects – projects that fall under the thresholds that define a major investment project;
- Minor enhancement projects – projects that are small (<US$100k or US$<10 man-months), non-functional enhancements to existing systems, such as the addition or amendment of reports based on existing data, or minor technical upgrades.

2) 'Run the Bank' projects consisting of activities generally considered non-discretionary to keep installed systems up and running according to performance level and compliance standards. Examples include: day-to-day support; application support; regulatory compliance projects; ever-greening (utilising technology to mitigate risk of obsolescence or non-support from a vendor); disaster recovery and contingency readiness support.

These two categories include various types of project sub-categories as illustrated below.

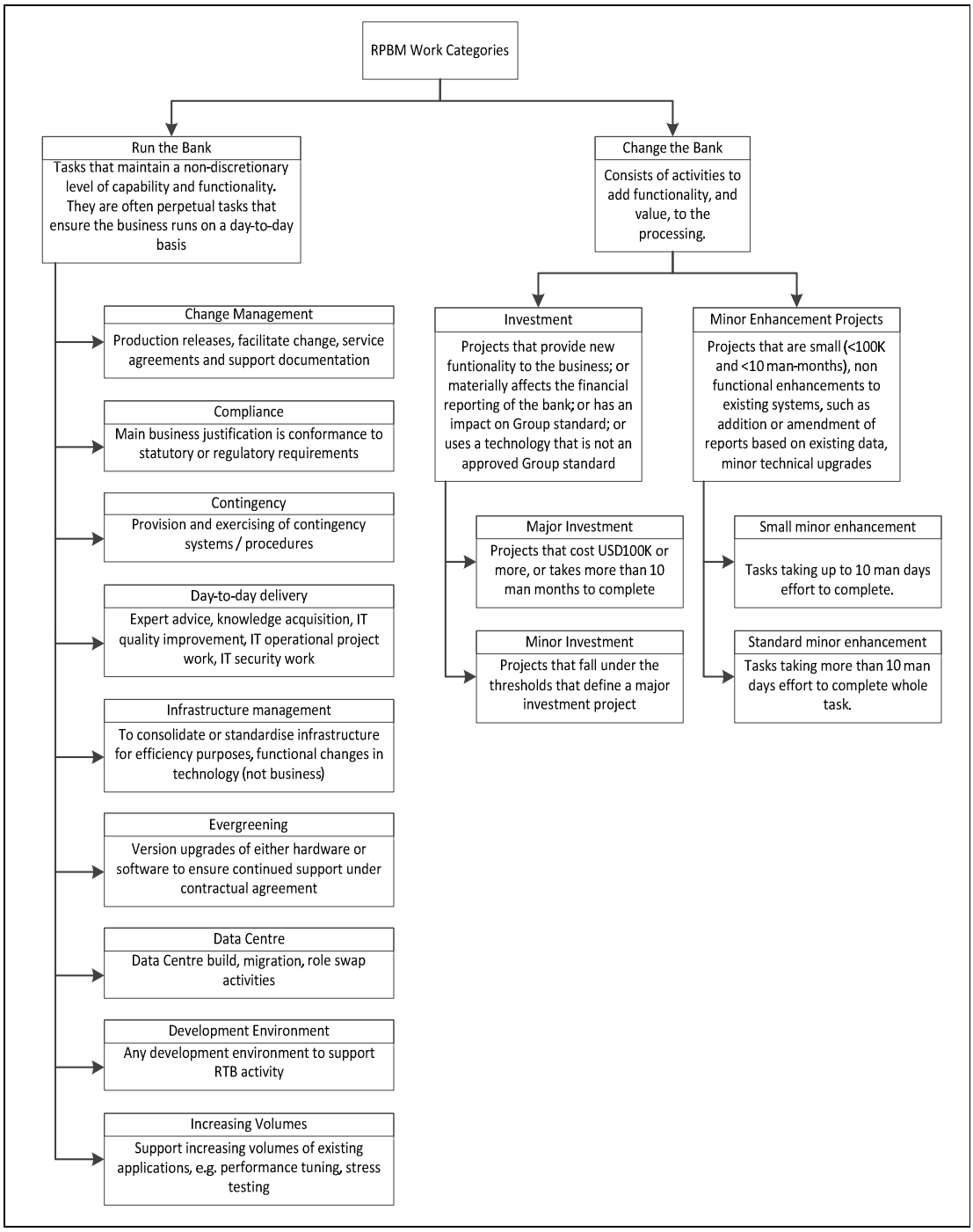

Figure 2.4: Project categorisation with respect to the organisation under study

Source: Adapted from material provided by the organisation

The bank has the facility to use a global PM tool known as Clarity. This is a group system for PM, resource management, resource capacity plan management workflow and progress reporting. Clarity also shares the same high-level project categorisation, i.e.

'Run the Bank' and 'Change the Bank' structure although the sub-categories are not fully aligned.

As an example, Clarity has a project type based on 'Organisational Effectiveness Alignment'. This was introduced in 2011 to support the group's cost challenge strategy and sub-categorises projects according to cost drivers. This includes:

Project Sub-Category	**Aim**
Business target operating model implementation.	Establishing standardised business and customer propositions to drive operational and distribution capabilities.
Re-engineering global functions and head office.	Improve how global functions and head office support the business.
Process re-engineering.	Move a set of locally disparate processes to consistent, globally aligned processes.
Streamlining IT (Information Technology).	Drive IT effectiveness by reducing systems spend, migrating IT work to low-cost markets and aligning IT closely with the business.
Other cost challenge projects.	Projects that support the cost challenge initiative, but do not fall into any of the above categories.

Table 2.6: Project sub-category

Source: Adapted from material provided by the organisation

In addition to the availability of Clarity, a Group Risk Based Project Management (RBPM) methodology is followed by the main IT services division, although RBPM and Clarity are not compulsory across the whole bank. Other business units within the same organisation may use different project categorisation. As an example, the Global Banking division has an Investment category for projects. It does, however, label these differently. Without going into the finer details of how the projects are categorised, some of the category groups are: 1) revenue; 2) regulatory; 3) operational risk and control; 4) ever-greening; 5) group mandatory.

The above examples support the investigation of Archibald and Vladimir (2003) who recognised that for large organisations there would exist a wide variety of projects within each project category or sub-category and these categories are not necessarily mutually exclusive, i.e. many projects may include aspects across categories.

Research by Crawford et al. (2004) into the project categorisation system in practitioner organisations identified four dimensions of complexity as hierarchical systems, parallel systems, composite attributes and exceptions. They proposed a project categorisation system which is composed of both organisational purposes (e.g. business development, better customer understanding) and the attributes (e.g. complexity, cost, size, risk type, compliance) used to categorise projects. Their research involved 119 web-based questionnaire responses and nine focus groups and resulted in the identification of 31 organisational purposes and 39 categorisation attributes.

The organisation for this research is situated within the knowledge intensive service industry which we understand to have the following characteristics as described by Yuh-Jen et al. (2012, p. 13136):

- Knowledge orientated – the performance and accomplishment of each organisational activity relies highly on the utilisation of domain knowledge and experience to ensure business models operate normally;
- Knowledge expertise – the establishment and supply of professional services are generally based on professional knowledge;
- Knowledge innovation – to provide superior customer services, the organisation generally enhances their service innovative abilities by knowledge innovation;
- Knowledge value-added – collaboration is an important competitive strategy so that completed knowledge value-added services can be provided to customers.

When we discuss knowledge intensity we also need to consider whether we are primarily referring to the knowledge of the personnel as the major resource (Alvesson, 2000) or knowledge embedded in organisational routines (Starbuck, 1992). For this study we are more concerned with the people-centric aspects of knowledge intensity which implies that the organisation relies more on an intellectually skilled workforce.

Miles et al. (2006, p. 2) describe collaboration as ‘a process where two or more parties work closely with each other to achieve mutually beneficial outcomes’. They assert that to take commercial advantage of this, competence and experience, intrinsic motivation, trust and the efficient sharing of ideas and information are needed.

The broad complexity and non-exclusivity of project categorisation described above illustrates how difficult it would be to perform research into a single project category.

The research undertaken concerns 'knowledge intensive collaborative projects'; this utilises the collaborative knowledge resources of the project team members in order to successfully deliver project outcomes.

2.2.4. Project Complexity

Projects have been regarded as complex systems that need to be managed. This is not only due to the technical issues, but also because they involve organisational factors which are out of a project manager's control (Whitty & Maylor, 2009).

One of the major themes which emerged from the UK Government-funded research network called *Rethinking Project Management*, was 'the fact that "real" projects and programmes are much more complex, unpredictable and multidimensional than the rational, deterministic model which dominates the literature' (Winter, Smith, et al., 2006, p. 644). In presenting how experienced project practitioners describe their workplace terrain, Winter, Smith, et al. (2006, p. 645) quote Schon's (1983) metaphor of 'swampy lowland where situations are confusing "messes" incapable of technical solution…' and approached through experience, intuition and the pragmatic application of theory in practice.

Crawford et al. (2006, p. 45) identified eleven characteristics of complexity: project scope; number of sites, locations, countries; number of functions or skills; organisational involvement; clarity of goals; level of ambiguity and uncertainty; risk source and location; technical complexity; component of large project; familiarity; and organisational support.

In understanding a project environment, we also need to understand the level of complexity involved. Baccarini (1996) infers complexity as being a critical project dimension which supports managerial decisions and subsequent actions. The influence of

project complexity is widely acknowledged to include the following characteristics (Baccarini, 1996, p. 201):

- facilitates the understanding of planning, coordination and control requirements;
- obscures the clear identification of goals and project objectives;
- affects project resources selection, e.g. personnel experience and expertise;
- affects the project objectives concerning time, cost and quality.

Baccarini (1996, p. 202) defines project complexity as 'consisting of many varied interrelated parts', which can be elaborated in terms of differentiation and interdependency. To support his discussion, he utilises organisational and technological complexity as illustrated below.

Complexity Type	**Differentiation**	**Interdependency**
Organisational	The number of formal organisational units, division of tasks, number of specialisations.	The degree of operational inter-dependencies between organisational elements.
Technological	The number and diversity of inputs, outputs, tasks or specialities.	The interdependencies between tasks, teams, technologies or inputs.

Table 2.7: Organisational and technological complexity (Baccarini, 1996)

Building on Baccarini (1996) and Turner and Cochrane (1993), Williams (1999) considers whether structural complexity, the number of interdependent elements, and uncertainty in goals and methods, can be operationalised. He characterises that overall PM complexity can be described in terms of the uncertainty of goals and methods, as well as structural uncertainty. Structural uncertainty consists not only of the number of elements, but also their interdepencies, which is regarded as essential.

Geraldi and Adlbrecht (2007) stress that a project and its related issues should be looked at holistically rather than reviewing singular attributes. This concerns understanding the pattern of complexity, which consists of its interrelated and dynamic attributes, in order to respond and manage the complex situations which arise. They present a pattern of complexity framework consisting of ten characteristics and categorised according to the

three main types of complexity: faith, fact and interaction. These are illustrated in the table below.

Complexity of faith refers to uncertain situations, complexity of fact is related to the structural complexity, and the complexity of interaction concerns the complexity of the relationship.

Group	**Characteristics**	**Translation**
Fact	Size	Size of project
Fact	Interdependency	Dependency of other departments
Fact	Interdependency	Dependency of other companies
Fact	Number of sources	Quantity of information to analyse
Fact	Number of sources	Quantity of sources of information
Fact	Number of sources	Quantity of partners and contact persons
Faith	Maturity	Low maturity level
Faith	Uniqueness	New technology
Faith	Uniqueness	New partners
Faith	Uniqueness	New processes
Faith	Dynamics	Dynamic (changing information, specifications, change orders, etc.)
Faith	Dynamics	Variations and open options
Interaction		People
Interaction	Transparency	Company politics
Interaction	Multi-reference	Internationality
Interaction	Multi-reference	Multidisciplinary
Interaction		Client

Table 2.8: Translating characteristics to the project management field (Geraldi & Adlbrecht, 2007)

Comparing Geraldi and Adlbrecht (2007) pattern of complexity with research involving a series of interviews and questionnaire surveys, Azim (2010) highlights the importance of people, product and process (3P) with project complexity, and Azim et al. (2010) perceive the relationship between project complexity types and the proposed (3P) determinants as illustrated below (p. 394).

	Determinants of Project Complexity		
Complexity Types	People	Product/service	Process
Structural	Number of teams / departments / clients / suppliers. Team location.	Number of subsystems. Number of technologies.	Organisational structure. Resource management. Stakeholder management.
Technological	Technical knowledge / expertise / experience.	Newness / novelty of technology. Technical design difficulties.	Technology management.
Uncertainty	New teams. Poor relationships. Lack of senior management support. Lack of leadership.	Lack of clear specifications. Number and variation of options. Newness / novelty of technology.	Scope management. Change control. Stakeholder management. Planning & scheduling.

Table 2.9: Perceived relationship between complexity types and proposed determinants (Azim et al., 2010)

The literature review on project complexity illustrates a focus on structural complexity, technological complexity and uncertainty. It does, however, identify a need to consider the softer aspects that contribute to the overall project complexity. Geraldi and Adlbrecht (2007), investigating the patterns of complexity, conclude that the complexity of interaction, e.g. people, internationality, multidisciplinarity and clients, as the most dominant and important factors of complexity.

With regards to the softer aspects of project complexity, complexity is a socio-cultural phenomenon (Moody & Dodgson, 2006). Winter, Smith, et al. (2006) posit that it is people, not tools or methods, and their ability to manage the complex environment of projects which is key to the delivery of successful project outcomes.

2.2.5. Project Practitioner Competence

Carrying out research concerning project participant competence, Skulmoski (2005) concludes that although there is no generally accepted definition of competence, there are many variations available, but many of them are limiting. He discusses the importance of the application of the competencies, rather than the competences themselves, e.g. knowledge and skills, and observes that some competencies, for example, judgment may not be observable.

Investigation into the role of the project manager and aspects of competence have been traced back to Gaddis (1959, p. 1) where he states that 'the primary tool available to him is the brainpower of men who are professional specialists in diverse fields. He uses this tool in all the phases in the creation of his product'. Gaddis (1959) emphasises the need for the successful project manager to be able to manage both tangible and intangible factors of the project, as well as having an integrative capability for connecting up all the project components into a systematic whole.

The International Project Management Association's Competence Baseline (ICB) defines competence as 'the demonstrated ability to apply knowledge and/or skills, and, where relevant, demonstrated personal attributes' (IPMA, 2006, p. 3). The ICB consists of forty-six competence elements and describes them in the three different ranges of technical, behavioural and contextual competences.

The PMI defines competency as 'a cluster of related knowledge, attitudes, skills, and other personal characteristics that affects a major part of one's job' (PMI, 2007, p. 83). Their Project Management Competency Development Framework consists of three separate dimensions:

- knowledge about the application of processes, tools and techniques for project activities;
- performance in the application of Project Management (PM) knowledge to meet project requirements;
- personal behavioural aspects such as attitudes and core personality characteristics when performing activities within the project environment.

Performing a survey of 22 project managers and 66 project personnel to investigate the methods of interpersonal influences and project managers' effectiveness, Gemmill and Thamhain (1973) identified that friendship was the most controversial factor, where 37 percent considered it as one of the three most important reasons for support, and 32 percent considered it to be one of the three least important reasons for support. Their findings also suggest that enhancing the level of support is related to intrinsic motivational factors around interest and challenges of the project itself.

A major role of the project manager also involves eliciting support and resources from colleagues across various functional areas where they have no formal authority (Gemmill & Thamhain, 1973).

With a questionnaire sample of nearly 300 project managers and nearly 1,400 statements to investigate what PM skills made a difference in successfully managing projects, Posner (1987) identified six skill areas: communication; organising; team building; leadership; coping and technical. The highest ranking skill was 'being a good communicator' which 84 percent of respondents attributed as an essential PM skill.

In a review of sixty specialist publications, rather than presenting a 'grocery list' of requirements, Pettersen (1991) developed an integrated requirements profile for project manager selection. He proposed twenty-one predictors, emphasising that these should be tailored to each individual case grouped into five sets as illustrated below:

1. problem solving includes problem analysis, judgment and practical sense, and decisiveness;
2. administration combines management skills (planning and organisation, control), political aspects (strategy and organisational know-how), and technical aspects (specialised knowledge) of management;
3. supervision and project team management involves the overall team management and the manager's behaviour towards the individual team members;
4. interpersonal relations comprises basic general skills, such as oral communication, interpersonal influence, persuasion and negotiation;
5. other personal qualities includes the need to achieve, proactivity, self-confidence, maturity and emotional stability, loyalty, honesty and integrity, openness to change and interest in the job.

Surveying 76 experienced project managers (minimum of ten years' experience in project management) with open-ended and forced-answer questions, Zimmerer and Yasin (1998) identified that technical competence was only rated third with respect to the characteristics of an effective project manager. Out of nine characteristics, eight were of a managerial context, indicating that effectiveness is perceived to relate to the ability of

the project manager to lead and manage rather than a reliance on technical competence. The most significant characteristics of an effective project manager are listed below (p. 36):

1. leadership by example;
2. visionary;
3. technically competent;
4. decisive;
5. good communicator;
6. good motivator;
7. stands up to upper management when necessary;
8. supportive team members;
9. encourages new ideas.

Note: Characteristics are ranked from the most important (1.) to the least important (9.).

A defined role of the project manager is difficult to determine as 'there is no recognized development path' (Thomas & Mengel, 2008, p. 306) where Kerzner (2009, p. 148) states that '[s]ome companies further require that the individual spend an apprenticeship period of twelve to eighteen months in a line organization to find out how the company functions, to become acquainted with the people, and to understand the company's policies and procedures'.

Utilising interviews and 170 questionnaires on project managers, Edum-Fotwe and McCaffer (2000) identify that the overall role of the project manager has evolved from a technical orientated to a more managerial and business orientated perspective. Reviewing the changes in PM skills needed from 1985 to 2008, Kerzner (2009) supports the reduced emphasis on technical skills and the increased need for business knowledge, risk management and integration skills.

Spencer and Spencer (1993, p. 9) define competency as an 'underlying characteristic of an individual that is causally related to criterion referenced effective and/or superior performance in a job or situation' and identify five competency characteristics separated into surface and core competencies.

Referring to an iceberg, Spencer and Spencer (1993) describe surface competencies as visible competences such as knowledge and skill. These are considered to be relatively easy to develop through training and experiences. Under the surface, hidden competencies refer to the behavioural, or the personality characteristics of motives, traits and self-concept and are considered to be the most difficult to develop.

Building on the definition of competency by Spencer and Spencer (1993) and Heywood (1992), Crawford (2005) acknowledges that competence is not a single construct and proposes an integrated model based on knowledge, skills, personality attributes and performance-based competencies as shown below.

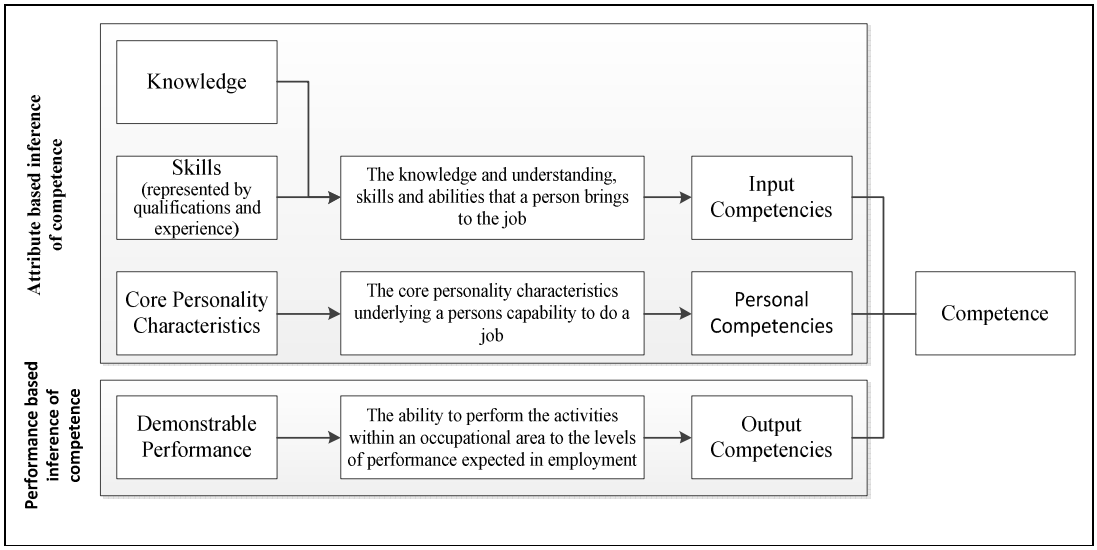

Figure 2.5: Integrated model of competence identifying components of the overall construct (Crawford, 2005)

The competence of PM personnel is seen as having a major impact on project performance and therefore business performance (Chipulu et al., 2013; Crawford, 2000, 2007).

Customer-orientated product development projects are generally implemented in incremental rather than radical stages. Although the product requirements are normally obtained prior to initiation, it is the project leader and team that need to determine how best to deliver the project (Lindkvist, 2008). As mentioned earlier, product development

projects are categorised by Turner and Cochrane (1993) as having a well-defined goal, but poorly defined methods of achieving success. In these situations where there is limited or ambiguous direction, Lindkvist (2008) advises that trial and error may be used in order to reduce uncertainty.

Cleland (1995) posit that the success or failure of a project rests with the leadership excellence of the project leader and how one can positively influence the stakeholders. He lists some of necessary influencing characteristics as including charisma, networks, interpersonal skills, empathy and coaching techniques (p. 87). The project manager has been identified as the one 'drawing together human, natural and technological resources in a dynamic organisation to deliver ends that include the social as well as the technological' (Blackburn, 2002, p. 199).

A diverse range of competency typologies and approaches exist. These range from the generic to the more context specific (Ahsan et al., 2013). Despite the numerous varieties and definitions, competencies are generally recognised as consisting of knowledge, skills and abilities used to improve performance (Cleland, 1995; Hayton & Kelley, 2006; Morris & Pinto, 2007; Ulrich et al., 2008).

The performance of the project leader, however, may not be related to personal abilities or motivation, since there are many influencing factors (Einsiedel, 1987). An example of such a factor could simply be the incumbent being assigned to a project over which they have little control. Einsiedel (1987) asserts there are five essential characteristics to effective project leadership: credibility, creative problem-solving ability, tolerance for ambiguity, flexible management style and effective communication skills.

With respect to context, the PM literature identifies a large and varying assortment of project-related characteristics which may influence the management of projects. This includes size, duration, geographical location, technology, complexity, uncertainty, level of risk, urgency, nature of the workforce, degree of definition and product (Besner & Hobbs, 2008; Crawford et al., 2006; Turner & Cochrane, 1993).
Further to this, there is the organisational context in which one is required to operate. This includes internal factors such as organisational climate (communications, continuity

of work), degree of top management support, level of project manager authority, customer orientation, stability of project scope and goals, and external factors such as politics, economics and technological developments (Huemann et al., 2007).

With respect to knowledge, Crawford (2005) posits that there is no statistically significant evidence which supports that project managers who perform well against the PM standards for knowledge and the use of practices, i.e. Project Management Body of Knowledge and Competency Standards, will be recognised as having provided enhanced workplace performance.

2.2.6. Summary

It is important to emphasise that the above literature review has only illustrated some of the PM knowledge areas and required competencies of project practitioners. It is important to understand that PM competence varies with the nature of the project and the context within which it is undertaken. The scope of the knowledge areas required for managing projects is wide and diverse and will be influenced by the project type, organisational requirements and industry context (Besner & Hobbs, 2008; Edum-Fotwe & McCaffer, 2000).

2.3. Knowledge (Types Of)

Kogut and Zander (1992, p. 386) acknowledge that there are many suggestions for categorising organisational knowledge and present their two distinct forms: that of information which implies 'knowing what something means', and know-how which is a description of 'knowing how to do something'. Nonaka and Takeuchi (1995, p. 8) also define two basic types of knowledge as being:

> *Explicit: can be expressed in words and numbers, and easily communicated and shared in the form of hard data, scientific formulae, codified procedures, or universal principles. Thus knowledge is viewed synonymously with computer code, a chemical formula or a set of general rules.*

> *Tacit: highly personal and hard to formalise, making it difficult to communicate or to share with others. Conclusions, insights and subjective hunches fall into this category of knowledge. Furthermore, tacit knowledge is deeply rooted in an individual's action and experience, as well as the ideals, values, or emotions he or she embraces.* (Nonaka and Takeuchi (1995, p. 8)

Further to distinguishing two categories of knowledge, Kogut and Zander (1992) compare these with computing terminology such that information refers to declarative knowledge and the statements to describe a process, whereas know-how compares with procedural knowledge and the understanding of how the organisation works across formal and informal boundaries. They also present the static components of organisational knowledge between personal, group, organisational and network knowledge as depicted below (p. 388).

	Individual	**Group**	**Organisation**	**Network**
Information	- Facts - Symbols	- Who knows what	- Profits - Accounting data - Formal and informal structure	- Prices - Whom to contact - Who has what
Know-how	- Skill of how to communicate - Problem solving	- Recipes of organising such as Taylorist methods or craft production	- Higher-order organising principles of how to coordinate groups and transfer knowledge	- How to cooperate - How to sell and buy

Table 2.10: Knowledge categories (Kogut & Zander, 1992)

Similar KM frameworks focusing on the dual knowledge dimensions – explicit/tacit and individual/social – were also considered by other researchers (Hedlund, 1994; Nonaka, 1994; Spender, 1994).

Extending the Kogut and Zander (1992) model, Hedlund (1994, p. 77) distinguishes four levels of carriers, or agents of knowledge: individual, small group, organisational, and the inter-organisational domain (important customers, suppliers, competitors, etc.) and focuses on the interaction between them. Three interactive processes are identified:

- Reflection (vertical) – articulation and internalisation (where articulation refers to tacit knowledge being made explicit, and internalisation is when articulated knowledge becomes tacit);
- Dialogue (horizontal) – extension and appropriation (where extension is the transfer of knowledge from lower to higher agency levels, and appropriation is the reverse);
- Expansion – assimilation and dissemination, which concerns the input and output of knowledge from and to the environment.

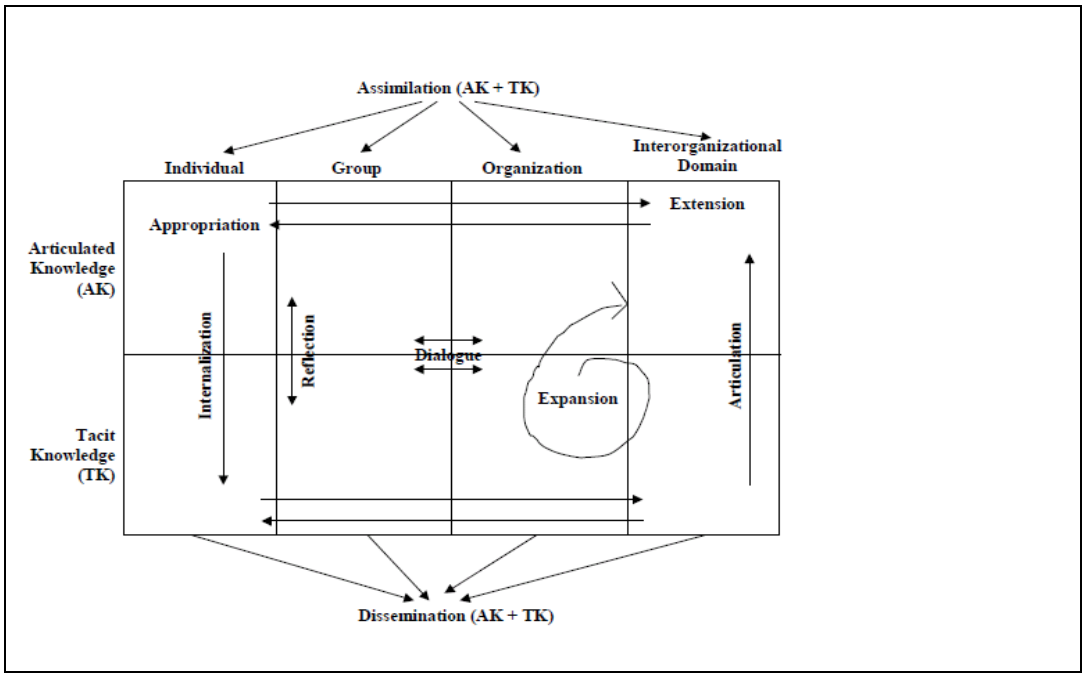

Figure 2.6: Model of knowledge categories and transformation processes Hedlund (1994)

With respect to projects, effective knowledge transfer amongst projects has been suggested to provide positive influences on performance (Cooke-Davies, 2002; Landaeta, 2008). In order to meet their objectives, projects need: technical knowledge to execute the project tasks; problem solving when issues and crises occur; and finally knowledge that facilitates continuous improvement (Landaeta, 2008).

In order to maintain competitive advantage, project organisations must continuously learn and build their knowledge from experience, and improve their knowledge faster than the competition (Kotnour, 1999; Owen et al., 2004). The knowledge needed by a project can

potentially be found in concurrent or closed projects within the same project-based organisation (Dixon, 2000). It is mainly tacit knowledge that makes an organisation competitive, since tacit knowledge not only concerns the facts, but the relationship among the facts (Dixon, 2000).

2.3.1. Knowledge and Tacit Knowledge

The basic definition of knowledge remains controversial (William, 2007); however, for the context of this study we use the definition of knowledge as stated by Davenport and Prusak (1998, p. 5):

> *Knowledge is a fluid mix of framed experience, values, contextual information and expert insight that provides a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of knowers. In organisations, it often becomes embedded not only in documents or repositories but also in organisational routines, processes, practices and norms.* (Davenport and Prusak (1998, p. 5)

According to Nonaka and Takeuchi (1995), there are two opposing but complementary approaches of knowledge inquiry in western philosophy. The first approach is known as rationalism, which asserts that knowledge can be obtained deductively by reasoning, laws and theory. The other approach is empiricism, which argues that there is no a priori knowledge and knowledge is derived inductively through sensory experience.

Weiss (1999) introduces the concept of rationalised knowledge and embedded knowledge for knowledge intensive professional service firms. Rationalised knowledge is 'general, context independent…and…widely applicable to multiple clients or projects' (p. 66). It tends to be found in written form such as methodologies, templates and standard operating procedures.

Conversely, embedded knowledge is harder to collect as it is context dependent, individually held, and may be distributed across multiple individuals. It is generally acquired via conversations, and allows one to develop a multifaceted understanding of a

situation. Difficulty in retrieving such knowledge is influenced by factors such as reciprocity, trust, power, politics, rewards and incentives (Weiss, 1999).

Polanyi (1966, p. 4) described knowledge as the fact that 'we can know more than we can tell' and classified human knowledge into two categories. His distinction between explicit and implicit knowledge has been asserted to have had the most impact on the dynamic knowledge-based view (theory) of the organisation (Spender, 1996). Explicit or codified knowledge refers to the knowledge that is transmittable in formal, systematic language. Tacit knowledge is deeply rooted in action, commitment, and involvement in a specific context. It has a personal quality which makes it hard to formalise and communicate (Polanyi, 1966).

With regards to organisational knowledge, this can be analysed along two dimensions: the epistemological and the ontological (Lam, 2000; Nonaka, 1994). The epistemological dimension concerns Polanyi's (1966) distinction between explicit and tacit knowledge, whereas the ontological dimension refers to the knowledge which resides at the level of the individual, or is shared amongst members of the organisation at a collective level.

Cook and Brown (1999) contend that organisations can be better understood if these four (explicit, tacit, individual and group) coequal forms of knowledge are treated distinctly. They describe both 'knowledge *used in* action and knowing *as part of* action' (p. 383), whereby the interaction of them both can generate new knowledge and new ways of knowing.

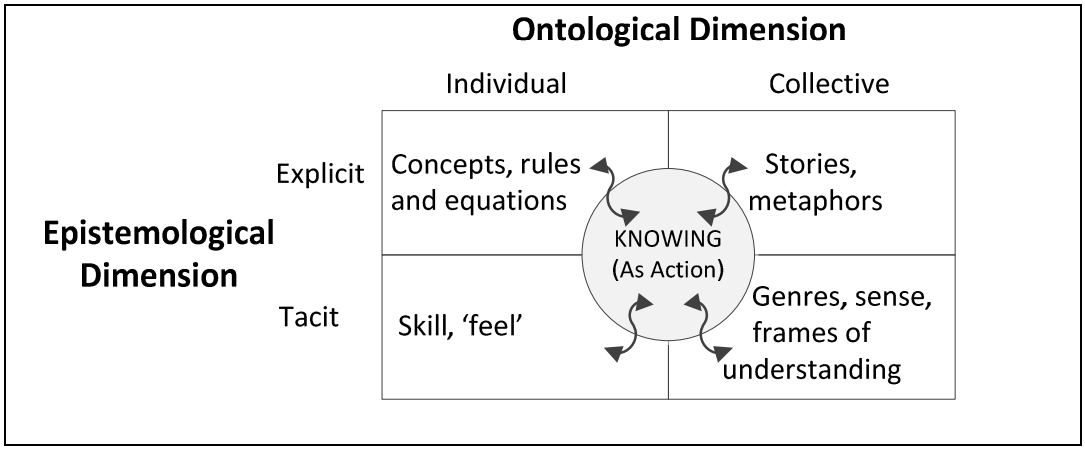

Figure 2.7: Knowledge and knowing. Adapted from Cook and Brown (1999)

Tacit knowledge has been regarded as an enabler of knowledge creation and for western organisations, the main role of KM has been used to codify tacit knowledge into explicit knowledge (Balconi, 2002; Nonaka & Takeuchi, 1995). The concept of tacit knowledge is also prominent in emerging theories and KM models (Nonaka, 1994; Spender, 1996; William, 2007). Polanyi (1966) refers to knowing from both practical and theoretical knowledge aspects where perception may be considered the most simple form of tacit knowing. He asserts that the skill of a driver, i.e. tacit knowledge, cannot be replaced by learning about theory of the vehicle, and that 'interiorizing' knowledge is gained by 'indwelling' (Polanyi, 1966, p. 30).

Building on Polanyi (1966), Nonaka and Takeuchi (1995) developed a spiral model of organisational knowledge creation. In this model, known as the SECI model, explicit processes of externalisation and combination of knowledge interact with the processes of socialisation and internalisation related to tacit forms of knowledge. They portray the codification of tacit knowledge as the end result of a knowledge conversion spiral that results from the interactions of explicit and tacit knowledge.

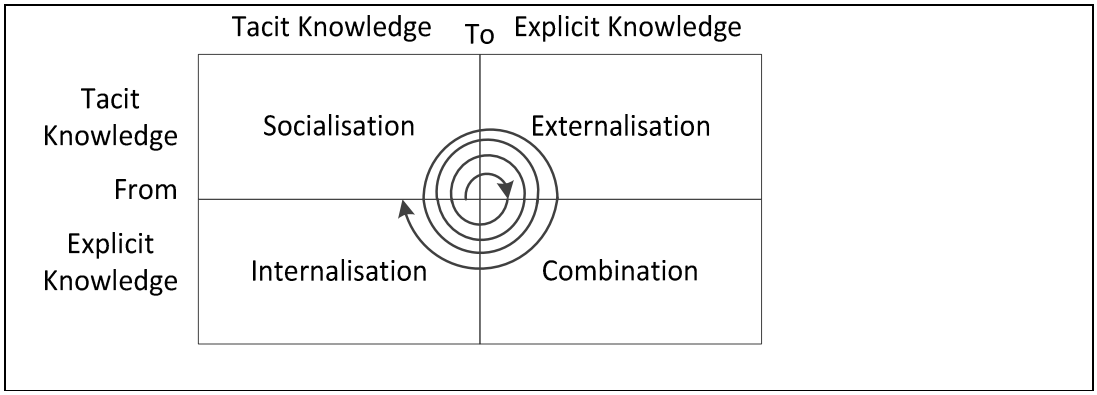

Figure 2.8: SECI model of organisational knowledge creation (Nonaka & Takeuchi, 1995)

Organisational knowledge is created during the continual and dynamic interaction between tacit and explicit knowledge (Nonaka & Takeuchi, 1995). Socialisation facilitates the sharing of members' experiences, mental models and technical skills. This triggers externalisation through dialogue, reflection, narrative and the process of

articulation. Bringing together the existing with newly created knowledge forms the basis for the combination mode. Finally the process of internalisation and 'learning by doing' embodies explicit knowledge into tacit knowledge.

The interaction between the explicit and tacit types of knowledge is central to Nonaka and Taneuchi's (1995) SECI model and they present some distinctions between tacit and explicit knowledge as illustrated below (p. 61).

Tacit Knowledge (Subjective)	**Explicit Knowledge (Objective)**
Knowledge of experience (body)	Knowledge of rationality (mind)
Simultaneous knowledge (here and now)	Sequential knowledge (there and then)
Analogue knowledge (practice)	Digital knowledge (theory)

Table 2.11: Distinctions between tacit and explicit knowledge (Nonaka & Takeuchi, 1995)

Nonaka and Takeuchi (1995, p. 8) present the Japanese view of knowledge as 'being primarily "tacit" – something not easily visible and expressible…highly personal and…deeply rooted in an individual's action and experiences'. Nonaka (1994) describes tacit knowledge in terms of technical and cognitive components. The technical component refers to the context-specific skills and know-how, whereas the cognitive component concerns an individual's perception, beliefs and mental models.

Building on Polanyi (1966) and Nonaka and Takeuchi (1995), Cook and Brown (1999) argue that explicit and tacit are two distinct forms of knowledge, where neither is a variant of the other; one form performs actions the other cannot, and that one form cannot be composed of or transformed into another. They debate that one form of knowledge could either be an aid or a hindrance in acquiring the other.

Whether or not it is argued that explicit and tacit knowledge are distinct or not, there appears to be a consensus that there is interaction across the explicit-tacit boundary. Spender (1996) also supports this phenomenon in stating that this boundary 'is both porous and flexible, so there is dialogue between the domains' (p. 50).

Tacit knowledge is practical know-how that is not normally openly stated, hard to change and difficult to share (Davenport & Prusak, 1998; Wagner, 1987). It includes intuitions, values, rules of thumb, and ways of doing things that arise from individuals' unconsciousness (Stewart, 1997). It is usually disseminated through informal interactions between individuals (Davenport & Prusak, 1998) and accumulated through experience and refined by practice (Polanyi, 1966).

Brown and Duguid (1991) reject the notion that knowledge can be isolated from practice and argue that knowledge is a result of social construction which derives its meaning from the context in which it is situated.

The acquisition of tacit skills is built up though experience and time, but these in themselves are not guarantees to predict the rate of tacit knowledge acquisition (Brockmann & Simmonds, 1997). Acquiring tacit knowledge does not require formal education, but is based on experience and a period of apprenticeship with practical application (Balconi, 2002; Polanyi, 1966).

Sharing tacit knowledge is subject to social interaction; being socially driven, time is needed to nurture informal social networks, and a certain level of personal intimacy is necessary (Choi & Lee, 2003; Nonaka, 1994). Distance, in terms of both physical separation and time is recognised as a boundary to sharing tacit knowledge (Leonard & Sensiper, 1998).

One of the most natural forms of collective tacit knowledge can be found in teams and groups where each of the individual's contributions are complementary and knowledge is created through their bonding and shared experiences (Leonard & Sensiper, 1998). A group's diversity in background, character and experience is appreciated in the creation of collective tacit knowledge since if all group members are of similar opinion, a narrow-mindedness may occur in the form of 'groupthink' (Janis, 1972).

A study on attitudes about sharing technical work and expertise in organisations (Constant et al., 1994) distinguishes between information as tangible 'product' and information as intangible 'expertise'. They argue that individuals are more likely to share

expertise as this is reflected in one's identity and inner qualities which may result in personal benefits such as increased self-esteem, pride, respect from others and reputation.

Osterloh and Frey (2000) posit that an individual is usually reluctant to share tacit knowledge when the knowledge is regarded as valuable or important because of a potential risk of losing advantage. A lack of a proper reward mechanism is also considered a major factor. In order to counter this reluctance, tacit knowledge sharing can be facilitated by intrinsic motivation, such as participation, sociability and personal relationship.

In order to encourage knowledge sharing, Constant et al. (1994) propose that organisations develop a culture of openness and social responsibility, where employees naturally contribute knowledge in order to support their organisational community and where there are ample opportunities to meet and exchange conversation and knowledge. Gold et al. (2001) and Nonaka and Takeuchi (1995) support this view to encourage formal and informal interaction and collaboration amongst employees in order to promote the transformation of individual knowledge into organisational knowledge. This interaction is also the basis for the creation of new ideas and knowledge (Gold et al., 2001).

From a business perspective, Lubit (2001) discusses ways to disseminate tacit knowledge within an organisation in order for it to become a core competence. This includes: fostering mentoring-based learning; forming communities of practice to promote socialising and conversations around experiences; and recording tacit knowledge in the form of learning histories, i.e. written narratives of critical events.

Corporate vision promotes a shared sense of purpose, and together with a system of corporate values determines the types of knowledge desired and the types of knowledge-related activities which are tolerated and encouraged (Levinthal & March, 1993). Explicitly stated visions, such as trust and openness are also identified as promoting KM behaviours (von Krogh, 1998).

2.3.2. Tacit Knowledge in Projects

A project may be considered as a 'knowledge intensive task, which can be approached in terms of quality and quantity of the knowledge' and categorised according to the use of tacit or explicit knowledge (Koskinen et al., 2003, p. 283). The delivery of projects requires applying a diversity of expert knowledge through the interaction with various stakeholders (Senaratne & Sexton, 2009). In order to facilitate the acquisition and sharing of tacit project knowledge one needs to get access to the views and opinions of other stakeholders through participating in a wide range of project-related activities (Koskinen et al., 2003).

Following case study research in the construction industry, Senaratne and Sexton (2009) suggest that the knowledge used in teams managing project change tends to be more tacit than explicit, and that such knowledge is gained from those across disciplines rather than just experienced by seniors in one's own field. This suggestion is consistent with earlier discussion that a diverse team with varied backgrounds would promote the creation of collective tacit knowledge.

Creating project knowledge requires a combination of managing objective information together with understanding and acting upon the subjective worldview of the project team members. These subjective worldviews can be harnessed and transformed into new tacit and project knowledge through socialising and informal interactions (Koskinen et al., 2003; Senaratne & Sexton, 2009).

Taking an action research approach to investigate IT projects, Nielsen and Madsen (2006) advise that project documentation and retrospective reflection in the form of post-mortems and post-project reviews may be a means of extracting the tacit personal knowledge obtained in the participation of projects. They advocate the use of story-telling for sharing tacit knowledge and building a shared understanding.

Although trust has been identified as a major factor in the sharing of tacit knowledge, Koskinen et al. (2003) assert that building of trust amongst project team members may be difficult due to the limited amount of time in building relationships and that trust is most often based on team members' project roles rather than the trust of individuals. They

conclude that the more trust that exists amongst the team members, the better the interaction between them, and hence the increased opportunity for the transfer of tacit knowledge.

Investigating forty-six closed projects across industries through surveys and interviews, Landaeta (2008) posit that efficient and effective learning and knowledge transfer processes across projects can positively influence the capabilities (i.e. the body of knowledge) of the projects concerned and their project performance. Although one must be attentive, that successful project knowledge transfer is a complex process which always involves influence from multiple factors on behalf of both the organisation and the project actor (Bakker et al., 2011).

The benefits of knowledge transfer and learning across projects to optimise value from investment and positively influence an organisation's long-term success has been widely supported (Pemsel & Wiewiora, 2013; Reich et al., 2014; Todorović et al., 2015). However, in reality, project practitioners concentrate more on project-based activities and neglect cross-boundary knowledge-sharing practices (Mueller, 2015; Swan et al., 2010).

To enable the effective sharing of project knowledge, a multidimensional approach which needs the simultaneous management of both relational and organisational processes (Bakker et al., 2011) is required. A knowledge-sharing mechanism that includes formal and informal mechanisms for sharing, integrating, interpreting and applying know-what, know-how, and know-why embedded in individuals and groups will also facilitate performance project tasks (Boh, 2007).

Mueller (2015) supports the claim that project-based organisations can benefit from both formally established and informal practices of knowledge sharing between project teams. Using over eighty interviews in their inductive study of five KIOs, their analysis also concluded that the trust of colleagues and top management positively influenced staff engagement in informal practices of knowledge sharing between project teams.

Thomas, George, et al. (2012) assert that the field of expert PM requires a more complex integration of rationality and intuition than the prescribed PM doctrine suggests. Taking

an interpretative approach to understand the lived experience of project managers, they posit that practical PM often involves 'a bricolage of project management artefacts used for more than their technical purpose' (p. 391), and those of more experience are able to 'craft' or create new usage from existing tools to facilitate the management of complex projects.

2.3.3. Knowledge Intensive Organisation

The past few decades have seen dramatic changes within the work context with a shift from a manufacturing to a service orientated economy and an increase in the scope and importance of the knowledge-based industry (Drucker, 1993; Grant et al., 2010; Tzokas & Saren, 2004). Makani and Marche (2012) quote various academics and practitioners of the growing interest in KIOs and knowledge intensive firms (KIFs).

By using the analogy where economists label firms as capital intensive or labour intensive to describe the relative importance of capital and labour as production inputs, Starbuck (1992, p. 715) labels a firm as knowledge intensive to imply that knowledge has more importance than other inputs, and human capital, as opposed to financial or physical capital, dominates.

Knowledge intensive companies may be categorised where the majority of tasks carried out can be deemed to possess intellectual characteristics and where educated and qualified experts form the major part of the employee work force (Alvesson, 2000; Nurmi, 1998; Starbuck, 1992). The organisation should be regarded within its normal operational environment to produce items and/or services using the knowledge of the personnel as the major resource (Alvesson, 2000, p. 1101).

The definition of 'knowledge intensive' covers a broad and diverse range of organisations (Robertson & Swan, 2003) where Alvesson (2000) gives examples to include the field of law and accounting, consulting companies, advertising agencies, R&D units, and high-tech companies. Alvesson (2000) and Starbuck (1992) both emphasise that KIFs are not necessarily professional services organisations as the category 'knowledge intensive' overlaps, being 'broader and does not emphasize the features ascribed to a typical

profession, such as code of ethics, a strong professional association' (Alvesson, 2000, p. 1101).

Nurmi (1998) asserts that 'a knowledge business is created when the know-how inside the firm and the needs of customers outside the firm meet…' and that 'knowledge intensive firms process what they know into knowledge products and services for their customers' (p. 26). Knowledge intensive firms exist where high levels of project interactivity are the norm (Newell et al., 2007) and their work is organised around projects (Pemsel & Wiewiora, 2013).

Acknowledging a lack of consensus amongst scholars and practitioners in the definition of KIOs, Makani and Marche (2012, p. 252) surveyed 129 KM professionals to identify six factors to define KIOs and concluded the following:

1. workers use novel knowledge to solve complex problems;
2. workers are held highly accountable for decisions;
3. workers have high cognitive skills;
4. organisations produce and sell knowledge;
5. organisations' core assets are its people;
6. organisations are accredited by a self-regulated body as the most defining factor for KIOs.

The field of KIOs crosses a broad category of professions and research concerned with this needs to take into consideration this heterogeneity, and the possibility of major variances depending upon the kind of KIO being investigated (Robertson & Swan, 2003).

2.4. Synthesis

The literature review presented in this chapter aims to present a summary of past empirical studies and identify research gaps relevant to the research objectives of this study. A general overview of the literature on PM, project types, the complexity of project, and project practitioners' competences was presented. This was complemented

by a review of the literature on knowledge, the various types of knowledge, with a focus on tacit knowledge in projects.

The purpose of this section is to synthesise those areas of literature which supported the development of the research to understand the 'actuality' or the 'lived' experience of project practitioners and how they use knowledge in their everyday environment and natural setting to deliver projects in accordance with stakeholder requirements.

The literature identifies an increasing criticism of the traditional prescriptive discourse of PM where many of the PM text books and methodologies treat all projects as the same and all project work can be governed by the same project theory. Subsequently there is a call for a greater emphasis on the 'soft' aspects and a better understanding of the intangible and tacit knowledge domains with regards to the management and delivery of projects.

It has been posited that the traditional view of projects, seen as being well-defined sequences of rational activities, is based on a deficient foundation, and should in fact be compared to complex, unpredictable environments, where project practitioners are faced with scenarios of confusing 'messes', with no straightforward technical solution.

The literature also identifies that, due to the wide range of contexts and types of projects, the use of the generic term 'project management', and consequently project management success may be misleading. There is much support for a move away from the metric-based success criteria of cost, time and quality and a move towards comprehensive measures, sometimes intangible, based on how stakeholders regard the project as having accomplished strategic objectives.

The uniqueness of each project has been illustrated in the commentary regarding project types and categorisation. In this respect, the limitation of PM tools has been identified and there is debate that the practice of PM should be regarded as a craft.

With regards to the project practitioner, it has been highlighted that the application of competencies, rather than just their possession, is more important in the successful

management of tangible and intangible project parameters. A project may be considered as a knowledge intensive task and categorised according to the use of tacit or explicit knowledge.

Although it has been posited that there is a need to support project practitioners' knowledge which is more concerned with tacit aspects rather than explicit aspects. some of these arguments are conceptual, or based on a lack of empirical evidence. Cavaleri and Reed (2008, p. 73) present their conceptual paper based upon the five ancient elements of essence, air, fire, water and earth, whereas, the suppositions of Thomas, George, et al. (2012) are '[l]argely conceptual in nature' (p377) and 'focus on developing theoretically grounded understandings of practical mastery' (p379).

Taking this discussion into consideration, the aim of the research is to present a model which has evolved from empirical evidence. Rather than just presenting a 'grocery list' of competencies, it is hoped that the model will facilitate understanding the context and practices of project practitioners and how tacit knowledge is managed and perceived as a factor in the delivery of successful projects.

2.5. Research Gaps

Historically, positivism has been dominant in research on projects (Smyth & Morris, 2007; van der Hoorn & Whitty, 2015) which has seen a growing concern with the widening gap between theory and practice (Bredillet, 2010; Oleary & Williams, 2013). This research hopes to provide a platform for an increase in the use of interpretative research methodologies, to further probe and gain deeper insights into the lived experiences of project practitioners.

The influence of social processes on PM still lacks understanding and there is a relative lack of literature on how best to coordinate the soft and intangible aspects of PM to gain best value for the organisation.

Chapter 2 has provided an overview of the relevant literature which informs this exploratory research in the domain of project KM. It has highlighted the key concepts, theories, definitions and literature, and has highlighted the research gaps

In Chapter 3, the research design and setting which facilitated this research investigation into the role of tacit knowledge in knowledge intensive PM are described. The research participant profiles are also presented.

CHAPTER 3. RESEARCH DESIGN

3.1. Research Design

The previous chapter presented an overview of the relevant literature that informs the exploratory study into understanding and explaining the 'lived' experience of project practitioners. The literature review shows continued calls to move away from the traditional prescriptive discourse of PM with more emphasis on understanding the softer, intangible and knowledge aspects with regards to the management and delivery of projects.

Growing concern was also identified regarding the dominance of positivist research methods in the investigation of projects. The research design was therefore formulated to address these issues and the main research objective to present a framework which explains how project practitioners use knowledge in their natural everyday environment in order to deliver projects in accordance with stakeholder requirements.

> *Qualitative research is a situated activity that locates the observer in the world…an interpretative, naturalistic approach to the world. This means that qualitative researchers study things in their natural settings, attempting to make sense of, or interpret, phenomena in terms of the meanings people bring to them.* (Denzin & Lincoln, 2005, p. 3)

The research undertaken is exploratory based, where the collection of data occurs within its natural setting sensitive to the participants of the financial services organisation under study. It seeks to understand a specific phenomenon and the data analysis will be inductive, recursive and interactive, in order to establish patterns and themes built from the bottom up.

Taking a qualitative approach implies that the research process is emergent and that all phases of the process may change or shift after the researcher enters the field to collect data (Creswell, 2007). Since we are concerned with the meaning rather than the measurement of organisational phenomena (Daft, 1983) and it is commonly believed that

a qualitative approach would provide a deeper understanding of social phenomenon than would be obtained from purely quantitative data (Silverman, 2010), the research takes a qualitative stance.

Qualitative researchers need to demonstrate that the results of their studies are an accurate account of the understanding achieved whilst experiencing the phenomenon (Moustakas, 1994). In order to address this, the process of verification and research quality will involve demonstrating both validity and reliability in the research results.

Validity concerns how well the results can be justified and considered to be a true and accurate reflection of reality (Roberts et al., 2009). It can also consider the trustworthiness with which the research can be evaluated (Marshall & Rossman, 1999).

Lincoln and Guba (1985) proposed four constructs to establish this criterion of trustworthiness:

1. *Credibility (internal validity)* aims to demonstrate that the inquiry was conducted in a manner to ensure the subject was accurately identified and described;
2. *Transferability (external validity*) concerns the applicability of one set of findings to another context, i.e. generalisation of the findings;
3. *Dependability (reliability)* attempts to account for changes in the study phenomenon and design due to an increasingly refined understanding of the research setting;
4. *Confirmability (objectivity)* asks whether the findings of the study can be confirmed by another.

Triangulation of data sources and methods is used to establish credibility and generalisability whereas documentation using depth, richness and detail (Geertz, 1973) is used to address transferability. The author will, however, take into consideration that this 'strength' to give rich descriptions of social settings may also be a weakness, i.e. exemplary instances, representativeness of findings and loss of original form, as identified by Mehan (1979).

To facilitate the dependability and confirmability of the research, an audit trail of the research process was supported by the use of a research journal (research diary) and the recording, transcription and participant verification of the interviews. The interview data collection process aims to be transparent and replicable, hence demonstrating credibility (Rubin, 2005).

Research dependability and confirmability were also supported by reporting the series of steps undertaken with the aid of an interview guideline (script) to ensure all processes were constantly adhered to. For example, the guideline included: self-introduction, describing the nature of study, reviewing consent form, reviewing definitions, re-iterating confidentiality and anonymity, etc. A copy of the interview guidelines can be found in the appendices.

Other strategies introduced to validate the qualitative research included acknowledging and clarifying the researcher's bias (Moustakas, 1994) and spending a prolonged time in the field (Creswell, 2003). The use of a PM-themed community of practice (COP), which the author co-founded within the research organisation, facilitated building trust with participants. The COP also facilitated the identification and subsequent selection of additional research participants (for example, from the completed membership form attached in the appendices) who were experienced and knowledgeable (Rubin, 2005) in the topic area of research.

Reliability is a measure of the extent to which a set of results can be regarded as dependable (Roberts et al., 2009) and refers to the degree of consistency (Silverman, 2010). In order to ensure reliability and consistency of measurement, an interview protocol was strictly followed. As mentioned earlier, this included reviewing and confirming consent and use of an interview script whilst obtaining data and clarifying any definitions with the interviewee.

The interview script and subsequent data analysis also took into account that the reliability of the interpretation of transcripts could be seriously weakened by 'the failure to transcribe apparently trivial, but often crucial, pauses, and overlaps' (Silverman, 2010, p. 288). All transcription copies were provided to interviewees for validation and again

informing them of their rights to withdraw from the research. Maxwell (2005, p. 94) recommends that 'soliciting feedback from others is an extremely useful strategy for identifying validity threats' and obtaining feedback from participants is the 'single most important way of ruling out the possibility of misinterpretation'.

The data collected was solely analysed by the author in order to support consistency of interpretation, and reduce any ambiguity in the coding or overlap of coding categories.

As the sole researcher, the author recognises that there are 'multiple sources of analytic bias that can weaken or even invalidate our findings' (Miles & Huberman, 1994, p. 263). With this respect the researcher looks for outliers in order to check for assumptions or representativeness and also to increase validity by triangulation across data sources and methods (Miles & Huberman, 1994; Denzin & Lincoln, 2005).

The profile of data sources, i.e. research participants are illustrated in section 1.3 with an 'outlier' interviewee profile in section 4.4. The research uses a variety of primary and secondary data methods which are referred throughout sections 5.2 and 5.3. Secondary data sources include the use of intranets to access blogs, wikis, executive videos and the use of information repositories, such as Microsoft SharePoint and shared networked drives, to access project documentation. Primary data sources involved the interaction with other colleagues in the form of interviews, workshops, seminars and casual discussions.

With respect to the research, the general objective was to investigate and understand with a neutral mindset about tacit knowledge in knowledge intensive projects. Bearing this in mind, the author was attracted to grounded theory and the rationale with Glaser and Strauss (1967) that within the field of sociology, there was too great an emphasis on the verification of existing theory (Goulding, 1999) and a resultant

> *…de-emphasis on the prior step of discovering what concepts and hypotheses are relevant for the area one wished to research…in social research generating theory goes hand in hand with verifying it; but many sociologists have diverted*

from this truism in their zeal to test either existing theories or a theory that they have barely started to generate. (Glaser & Strauss, 1967, pp. 1-2)

It is a common misconception that grounded theory requires the researcher to enter the field with a very limited knowledge of the problem under investigation; however, this is not necessarily so (Suddaby, 2006). There is much support which posits that preliminary reading is necessary for the researcher to come up with ideas and conceptually connect these to the developing theory in order to enhance theoretical sensitivity (Eisenhardt, 1989; Goulding, 2002; Suddaby, 2006).

The author acknowledges the conflict of 'inherent' bias in being employed by the case study organisation and performing investigation with a 'neutral mindset'. The subject of researcher bias is further discussed in section 4.5.

3.2. Research Setting

This study seeks to observe the phenomenon of organisational knowledge within a single multinational finance organisation. It aims to explore the current project-related practices within its natural environment and seeks to acquire a deeper understanding of the social phenomenon that may influence the efficient creation, dissemination and re-use of project knowledge.

This investigation into project knowledge, both tacit and explicit, examines the lived experiences of how project practitioners, for example project managers, business analysts and subject matter experts, interact with each other and experience the research organisation in order to gain and transfer knowledge for the best project outcomes.

The only way to really know what another person is experiencing is to experience the phenomenon oneself. Therefore, the author is directly involved with the research sample, i.e. financial organisation, and becomes a direct observer and key instrument for gathering data.

The research was undertaken within the Hong Kong operations of a global systemically important financial institution, whose operations cover a wide range of financial services across four customer groups: Personal Financial Services, Commercial Banking, Investment Banking and Private Banking.

Classified as an institute 'too big to fail' and 'whose disorderly failure, because of their size, complexity and systemic interconnectedness, would cause significant disruption to the wider financial system and economic activity' (Financial Stability Board, 2010, 2015), it is believed that a single case study organisation of this size and complexity would present enough challenges and sufficient data to provide meaningful analysis and recommendations. It is acknowledged that a single case study would limit generalisation and transferability as described earlier. As the author is also employed in the organisation, another rationale for the choice of a single case study as described by Yin (1994) is the opportunity to 'uncover some prevalent phenomenon previously inaccessible to social scientists…on the grounds of its revelatory nature' (p. 49).

3.3. Participants

The target population for the study was project practitioners who were all based in the same organisation and who were or had been involved in project-related activities. A purposeful sampling technique was deemed appropriate for the recruitment of research participants as it is important that all participants have experience of the phenomenon being measured (Creswell, 2007). In order to obtain a better understanding of what 'real life' is like, the qualitative data was collected in its natural setting and concerned with naturally occurring, ordinary events (Miles & Huberman, 1984). This was substantiated by '*local groundedness*, the fact that the data was collected in close proximity to a specific situation, rather than through the mail or over the phone' (p. 10). All of the interviews and supplementary conversations were carried out in face-to-face circumstances and on the organisation's premises.

With respect to grounded theory, sampling is directed by the theory, and the purposeful selection of samples is in accordance with the developing categories and emerging theory (Goulding, 2002). Theoretical and purposive sampling are often used as synonyms, and

Silverman (2010) posits that the only difference between the two procedures is when the 'purpose' behind the 'purposive' sampling is not theoretically defined. The research participants for this study were those who have been involved in projects for over five years and hence can be regarded as having sufficient project experience. Although this five-year 'qualifying period' was arbitrary, research participants were also chosen on the likelihood 'to replicate or extend the emergent theory' (Eisenhardt, 1989, p. 537).

The author recognises that there many cultural elements in a business context, such as national, corporate and professional culture (Hofstede, 2001; Ulijn et al., 2000) which may affect or bias the research results. The careful selection of interviewees assists in addressing issues of validity (Whitty, 2010), where the credibility of findings is also enhanced by interviewing participants who reflect a variety of perspectives (Rubin, 2005).

Culture can be defined as 'shared motives, values, beliefs, identities, and interpretations or meanings of significant events that result from common experiences of members of collectives that are transmitted across generations' (House et al., 2004, p. 15).

In research which covered over 50 countries, Hofstede (2001) identified five interdependent dimensions of culture: power distance, individualism, long-term orientation, masculinity and uncertainty avoidance. As described in section 2.2.3, uncertainty is inherent in project scenarios. The cultural dimension of uncertainty avoidance is defined as 'the extent to which the members of a culture feel threatened by uncertain or unknown situations' (Hofstede, 2001, p. 161) and concerns 'the extent to which the members of an organization or a society strive to avoid uncertainty by relying on established social norms, rituals, and bureaucratic practices' (House et al., 2004, p. 11).

Extending the work of Hofstede, the 'Global Leadership and Organizational Behavior Effectiveness' (GLOBE) research programme used over 160 scholars to survey over 17,000 middle managers from three industries and 62 cultures. They placed countries into clusters to indicate cultural similarity (House et al., 2004).

The profile of research participants is shown below to include their associated GLOBE country cluster.

No.	Role (as Identified during the Interview)	Sex	Project Management (PM) Experience	GLOBE cluster
1	Leading web development projects that are mainly related to IT and to create websites for the bank.	Male	Over 7 years PM experience, 3 with the bank and 4 with other organisations.	Middle East
2	Working in projects basically for all 12 years in different businesses in the bank: retail banking; commercial banking; global banking, and securities services.	Female	Twelve years with the bank and involved with projects from the start.	Confucian Asia
3	First seven years was mainly system development, and then started to get involved in PM for the risk, retail banking and wealth management areas.	Male	Almost 20 years with the bank and around 14 years involving projects.	Confucian Asia
4	Projects involving Corporate Agriculture, Credit and Risk, more lately in Financial systems.	Male	Almost 35 years with the bank and most of that with project involvement in various roles.	Anglo
5	Various business consulting and PM, analysis roles. Currently involved in finance transformation projects.	Male	Joined the bank around 18 months ago, but around 6 years' PM experience.	Southeast Asia
6	Three project-related areas in the bank since started with the bank.	Female	Started with the bank around 7 years ago; involved with HR transformation projects.	Confucian Asia
7	Currently work as senior project manager to manage the entire Asia Pacific projects related to risk management.	Male	With the bank for 2 years, with about 8 years' total PM experience including investment banking.	Confucian Asia
8	Primarily working with core banking, i.e. savings and lending, deposit and lending, product business. Looked after credit cards, ATMs, and self-service system projects.	Male	With the bank for about 17 years of which over 10 years will be project/programme management related.	Confucian Asia
9	Worked on different types of projects since joined the bank, involving business types roles and transformation projects, and portfolio management.	Male	Joined the bank around 7 years ago; working in projects.	Confucian Asia

10	Started off in IT industry working in projects at different levels including design, development and project and programme management to provide office solutions. Previously involved in publishing projects and on mobile projects within the bank.	Male	Joined the bank around 4 years ago with a total of around 10 years' PM experience.	Southeast Asia
11	Started off in operations and moved onto product development and operational efficiency projects.	Male	With the bank for around 30 years, with about 20 years involving projects.	Southeast Asia
12	Started off in accounting and product control then moved into finance transformation projects when joined the bank.	Female	Currently been in the bank for 5 years and been on projects since joined.	Confucian Asia
13	Around ten years' experience working on different aspects of financial services.	Male	Involved in projects for around 6 years.	Confucian Asia
14	Looking after the data operations and data projects for the securities services division.	Female	Been with the bank for 12 years, with over 10 years in PM.	Anglo
15	Projects mainly involving human resources and service quality.	Female	With the bank for over 30 years, with over 10 years' project experience.	Confucian Asia
16	Been involved in software development project and now with business consultancy projects over the last 3–4 years.	Female	'Been with the bank for a long long time' with more than 10 years' project experience.	Confucian Asia
17	Primarily involved in transformation projects, but various areas such as offshoring, processes and financial systems.	Male	Around 10 years PM experience.	Anglo
18	Currently working in projects for their third bank. Depends on nature and size of projects, but been involved in various aspects, e.g. credit cards, internet banking, e-commerce.	Female	Been involved in projects for around 13–14 years and been with the bank for 6 years.	Confucian Asia
19	Mainly involved in projects in a business analyst role, and currently working in mobile channels.	Female	Been with the bank in current role for around 5 years with approximately 10 years' PM experience in total.	Confucian Asia
20	Currently working as project manager of IT projects for channel systems. This includes ATM, internet channel, mobile banking etc.	Female	With the bank for over 10 years, and worked in PM for about 5 years.	Confucian Asia
21	Started as programmer, then moved	Female	Involved in projects for at	Confucian

	on to become team leader (i.e. less to do with programming).		least 8 years.	Asia

Table 3.1: Research participants' profile

According to the GLOBE research programme, Hong Kong is clustered under Confucian Asia and has an uncertainty avoidance rating in the middle range (House et al., 2004). Hofstede's (2001) research scores Hong Kong with a low uncertainty avoidance rating.

High uncertainty avoidance cultures are more concerned to avoid failure and errors (Yamazaki, 2005) and are resistant to exposure of new experiences and experiments (Joy & Kolb, 2009). Conversely, members of less uncertainty cultures are less resistant to change and innovation and 'tolerant of breaking rules' (Joy & Kolb, 2009, p75). They also regard achievement as a motivational factor which encourages active experimentation and working in unfamiliar situations (Yamazaki, 2005).
Venaik & Brewer (2010) warns of the differences and anomalies across the Hofstede and GLOBE models, where Trompenaars & Woolliams (2003) posit the limitations of cultural profiling tools. They claim to 'have found enough variation in any one country to know that it is very risky to speak of a national, corporate, or even functional culture in terms of simple stereotypes…[and the need to give]…more attention to the reconciliation of differences rather than to their simple identification' (p29).

This awareness of the cultural similarities and differences in uncertainty avoidance, combined with the generation of rich, thick descriptions (Geertz, 1973) regarding the research participants' project experiences and perceptions will facilitate researchers to determine generalisation and whether any 'shared characteristics' can be transferred to another setting (Creswell, 2007).

3.4. Informed Consent and Confidentiality

Prior to the interview the participants were informed of the research objectives and ensured anonymity. They were then asked to sign a statement of informed consent (copy attached in appendices) which authorised the author to use the interview information for

the purposes of the research. Participants were also reminded not to discuss the research topic(s) with others for risk of influencing the research outcome.

The statement also informed the participant that any information would be kept confidential and allowed the voluntary participant, over eighteen years of age, the freedom to withdraw from the study at any point in time.

Participants were also provided with the opportunity to review their interview transcriptions and confirm that any interpretations were consistent with their essence of the described phenomenon.

During the interviews many of the participants did refer to the name of the organisation or other colleagues for ease of understanding and explanation; however, the interview transcripts were amended accordingly in order to preserve participant and organisational anonymity.

3.5. Summary

Chapter 3 has covered the qualitative research design from this grounded theory approach, including the research setting, participant profile and the implementation of a statement of informed consent.

Chapter 4 will discuss in more detail the grounded theory methodology, and the data collection and analysis methods. This was all done taking into consideration best research ethics as described in the following chapter.

CHAPTER 4. METHODOLOGY

4.1. Introduction

The purpose of this interpretative qualitative research study was to gain a better understanding of the 'lived' experience of project practitioners as they 'navigate' the complex and unpredictable project environment within a knowledge intensive organisation.

Taking a qualitative approach implies an emergent research process where the researcher is the key instrument to collect data in the field of the participants' experience (Creswell, 2007). Through the research process, it was hoped that further to understanding 'lived' experience, the discovery of sufficient commonality would exist amongst the identified themes so that a model to represent the phenomenon could be developed.

When one is interested in describing the meaning of what a number of individuals have in common as they experience a phenomenon, this would imply phenomenology as an inquiry approach (Creswell, 2007; Miller & Salkind, 2002). As mentioned above, the author was aiming to move beyond description and, as Creswell (2007) suggests, this would imply a grounded theory approach to 'generate or discover a theory' (Creswell, 2007, p. 63) that 'explains a concept, process or interaction amongst individuals' (Miller & Salkind, 2002, p. 154).

In order to determine the research approach, the author took into consideration the following aspects.

With respect to the research question, Patton (2002) posits that phenomenological approaches are concerned with 'What is the meaning, structure, and essence of the lived experience of this phenomenon for this person or group of people?' (p. 132), whereas grounded theory building asks 'What theory emerges from systematic comparative analysis and is grounded in fieldwork so as to explain what has been and is observed?' (p. 133).

Creswell (2007) asserts that phenomenological research is based around two broad questions: 'What have you experienced in terms of the phenomenon? What contexts or situations have typically influenced or affected your experiences of the phenomenon?' (p. 61). Grounded theory building focuses on understanding a participant's experiences, the associated processes and asking questions around 'What was the process? What influenced or caused this phenomenon to occur? What effect occurred?' (p. 66).

With regards to reviewing literature in the grounded theory process, this was consulted only minimally at the start to support theoretical sensitivity, and further literature review was undertaken as part of the iterative cycle of data collection, simultaneous analysis and emergent interpretation (Goulding, 2005).

As for the collection of data, both phenomenological and grounded theory approaches may use a mixture of interviews, observation, texts and other forms of reference (Creswell, 2007; Starks & Trinidad, 2007) – though Goulding (2005, p. 302) contests that with phenomenology the 'only legitimate source of data…is the views and experiences of the participants themselves'. Similarly both research methods 'do not impose any view of the phenomenon under investigation to the interviewee' (Reiter et al., 2011, p. 41).

The difference in phenomenological and grounded theory approaches can be illustrated through the interviewing technique. For phenomenological interviews the data is usually presented in raw form as the focus is on individuals' subjective experiences, whereas for grounded theory building, the focus is on eliciting understanding regarding how reality is constructed through the relationships and interactions amongst social actors (Suddaby, 2006).

4.2. Grounded Theory Building in Phenomenological Research

This research was initiated based on a general topic of interest as opposed to attempting to address a specific problem, research question or goal. As the author's interest was not primarily to describe what is going on, but was more concerned with discovering what is going on, an emergent methodology in the form of a grounded theory approach was taken with reference to Glaser and Strauss (1967), Glaser (1998) and Eisenhardt (1989).

The origination of grounded theory has been accredited to Barney Glaser and Anselm Strauss, as presented in their book *The Discovery of Grounded Theory* (1967) as a reaction to the dominance of positivism in social research. They contend the lack of theory to cover all the necessary areas of social research and introduced the general comparative method to allow for 'the criteria of judging the worth of all theory' (Glaser & Strauss, 1967, p. 8).

They posit that the approach facilitates the study of complex entities due to its ability to produce a multifaceted account of organisational action in context. It has also been identified that grounded theory is particularly useful for organisational members to gain a perspective on their own work situations (Glaser & Strauss, 1964), underscoring the importance of accessing the tacit knowledge of organisational members (Partington, 2000).

This classical version of grounded theory (Glaser & Strauss, 1967) has been described as a rigorous but flexible method to generate theory from a detailed analysis of a sociological phenomenon. It facilitates the explanation in the commonality of results which come about from the consequences of common behaviour or situations (Miller & Salkind, 2002).

Following a split between the two original theorists, a subsequent version of grounded theory by Strauss and Corbin (1990) was developed with the 'paradigm model' at its core. Glaser (1992) refers to this approach as being too prescriptive, 'keeping all of the problems of forcing data' (p. 122), and continued to independently stress the importance of allowing theory to emerge from the data. A constructionist variant also emerged under the authorship of Charmaz (2000) with more focus on the views, values, feelings and assumptions of the individuals than on collecting facts or describing phenomenon (Miller & Salkind, 2002).

As this research concerns an in-depth case study, particular reference is made to Eisenhardt (1989) who synthesised work on qualitative methods, case study research design and grounded theory building. She presents a highly iterative process which is

closely linked to data for building theories from case studies. Three strengths of the process are asserted:

1. its likelihood of generating novel theory;
2. the emergent theory is likely to be testable with constructs that can be readily measured and hypotheses that can be proven false;
3. the resultant theory is likely to be empirically valid (pp. 546-547).

Recogising the variety of grounded theory approaches, the author chose to adopt that of Strauss and Corbin (1990). Although this approach has been described as 'fractured, detailed, cumbersome and over-self-conscious' (Glaser, 1992, p. 60) the author feels that a more structured approach would be appreciated by the practitioner community to which the results of this research is expected to be disseminated at a later date.

The use of an emergent methodology invokes data interpretation in an iterative process which is linked to the researcher's own worldviews. The principle is such that any preconceptions are avoided. This is hoped to facilitate the researcher to enter the study arena with an open mind and to be 'theoretically sensitive so that one can conceptualise and formulate a theory as it emerges from the data' (Glaser & Strauss, 1967, p. 46).

There are discussions on whether one should undertake a preliminary literature review prior to the investigation where Locke (2001, p. 25) states 'The researcher should enter the research process with as few advance assumptions as possible'. Dey (1993) advises, however, that one needs to find a focus without making premature assumptions and that '…there is a difference between an open mind and empty head. To analyse data, we need to use accumulated knowledge, not dispense with it. The issue is not whether to use existing knowledge, but how.' (p. 65).

Goulding (2005, p. 296) advises that there has been a common misconception that 'the researcher is expected to enter the field ignorant of any theory or associated literature', but quotes Glaser and Strauss (1967, p. 253) that 'no sociologist can possibly erase from his mind all the theory he knows before he begins his research. Indeed the trick is to line

up what one takes as theoretically possible or probable with what one is finding in the field'.

Eisenhardt (1989) recommends an initial research question be defined irrespective of how broad it may be. This is so as to facilitate the initial design of the theory building research and determine the kind of data that needs to be collected. It is, however, noted that 'most importantly, theory-building research is begun as close as possible to the ideal of no theory under consideration and no hypotheses to test…attempting to approach this ideal is important because preordained theoretical perspectives or propositions may bias and limit the findings' (p. 536).

With respect to data analysis, a method of constant comparison is utilised that requires the researcher to code and analyse at the same time rather than coding first and then analysing (Glaser & Strauss, 1967). This promotes the emergence of theoretical categories based on the evidence gathered and selective approach to cases and data gathering. Constant comparison has four purposes:

1. verifies the concept as a category denoting a pattern in the data;
2. verifies the fit of the category nomenclature to the pattern;
3. generates properties of the category;
4. saturates the category and its properties by the interchangeability of indicators.

(Glaser, 1998, p. 139)

It is believed that the gaps in the emerging theory will guide the researcher, as one will observe the gaps and direct the research accordingly to address the gaps (Glaser & Strauss, 1967).

Theoretical sampling and constant comparison should continue until one believes that theoretical saturation has been achieved by staying in the field until similar incidences occur over again, and no new evidence emerges which can inform or underpin the development of an emerging theory (Goulding, 2002). Theoretical sampling aims to 'generate categories and their properties' (Glaser & Holton, 2004, p. 7) and 'to maximize

opportunities to compare events, incidents, or happenings to determine how a category varies in terms of its properties and dimensions' (Strauss & Corbin, 1998, p. 202). Resultant theory which is deficient of theoretical sampling 'tends to be thin, lacking in both density and variability, in the sense that property development and the discovery of moderating variables tend to be underplayed due to the fact that both saturation and extensive memoing are not pursued' as posited by Jones and Noble (2007, p. 97).

'Grounded theory, seeks not only to uncover relevant conditions, but also to determine how the actors respond to changing conditions and to the consequences of their actions. It is the researcher's responsibility to catch this interplay' (Corbin & Strauss, 1990, p. 5).

4.3. Data Collection

Qualitative findings grow out of three kinds of data collection: 1) in-depth, open-ended interviews; 2) direct observation; and 3) written documents (Patton, 2002). Eisenhardt (1989) informs that inductive researchers typically use multiple data collection methods, but are not confined to the common methods of interviews, observations and archival sources. This triangulation of data collection methods supports a stronger substantiation of constructs and hypotheses. It has also been posited that a community-based approach to facilitate cross-project learning may be more effective than or, at least, a necessary complement to written documents, such as project documents and codified lessons learnt (Bresnen et al., 2003).

Grounded theory differs from other qualitative methodologies, such as phenomenology, which allows only the words and actions of the informants as a source of data, by allowing for a much wider range of data (Goulding, 2002). Therefore a 'community-based approach' was also introduced with the assistance of an inter-organisational COP and the promotion of community dialogue was facilitated by the use of conversation techniques such as The World Café (Brown, 2001), and Open Space (Owen, 1997). The 'community-based approach' is based on Wenger and Snyder (2000, p. 139) definition of communities of practice as 'groups of people in-formally bound together by shared expertise and passion for a joint enterprise' whereby the members 'learn by participating in the community and practising their jobs' (Bredillet, 2007, p. 1130) and have the

potential 'to become forums for development of…project manager expertise' (Ruuska & Vartiainen, 2005, p. 379).

A participatory research approach was taken in its natural setting with primary data mainly obtained from face-to-face conversations and semi-structured interviews. The semi-structured interview facilitates insight into individual experience and 'focuses on the deep, lived meanings that events have for individuals, assuming that these meanings guide actions and interactions' (Marshall & Rossman, 1999, p. 105). Workshops, meeting attendance, and participant observation were used to supplement data collection.

Primary data was supplemented by secondary data principally obtained from company and project-related documents, as well as meeting minutes, videos and internal communications via the company intranet.

In order to counteract criticism of the subjectivity of this research, multiple sources and methods of data collection were used. This was to establish a chain of evidence and by having the case study reviewed by key informants (Yin, 2003), this will facilitate triangulation and stronger substantiation of constructs and hypotheses (Eisenhardt, 1989).

The author is currently employed within the study site as a programme manager and also the co-founder and co-chair of a COP known as 'the Project Link'. This COP is jointly sponsored by the Corporate Sustainability Regional Office and the Human Resources (HR) department to promote employee engagement, diversity and inclusion within the bank. It uses the theme of projects and programmes, as a bridge across organisational silos, to bring together the diverse ideas, cultures and experiences on how to best succeed on our projects.

Communities of practice have been described as the basic building blocks of a social learning system (Wenger, 2004). They possess natural internal mechanisms where ideas and practices spread in work settings (Ayas & Zeniuk, 2001) and appear to be one of the most favoured and enduring organisational forms to encourage sharing of organisational knowledge (Kimble & Bourdon, 2008; Van Baalen et al., 2005). For this reason, The

Project Link is regarded as a valuable source of data, experiences and knowledge to undertake this research.

Research participants were chosen by a method of theoretical sampling. 'The aim of theoretical sampling is to maximize opportunities to compare events, incidents, or happenings to determine how a category varies in terms of its properties and dimensions' (Strauss & Corbin, 1998, p. 202). Therefore, the purposeful selection of participants was based on the author's knowledge of the population in accordance with the developing categories and 'to choose cases which are likely to replicate or extend the emergent theory' (Eisenhardt, 1989, p. 537). In addition to choosing participants based on the author's working relationship and understanding of them, research participants were also sourced from the Project Link community and chance encounters.

With regards to sample size, it was expected that the number of individual research participants for the interviews should be around twenty. Patton (2002) states 'there are no rules for sample size in qualitative inquiry' and a preliminary estimation of interview participants was identified by reviewing previous doctoral dissertations. White (2007) explored how ten research participants perceive their knowledge sharing experiences using hermeneutical phenomenology. In examining the interaction between project managers and project stakeholders, Nogeste (2006) supplemented preliminary interviews of fifteen research subjects with pre- and post-workshop quantitative surveys. McNichols (2008) investigation of enhancing knowledge sharing and transfer using a qualitative Delphi study involved twenty-four participants through purposive sampling.

At the final outcome twenty-one research participants were interviewed. One of the participants was a contract member of staff who had approximately ten years of consulting and PM experience in the financial services industry. As a contractor, the research participant only had five months of work experience within the case study organisation. This interview was not used as part of the full data analysis, but was used in order to assist in research validity to identify if there were any outlying or conflicting themes.

With regards to group workshops, three were undertaken within the data collection period. There were, on average, twenty participants per workshop, designed to identify project-related challenges and recommendations within the bank. The aim was also to sensitise the researcher to any issues which may not have been raised by the interviews or highlighted from other data.

For the interviews, all individual interviewees were provided with a statement of informed consent. This was explained line by line to the interviewees to ensure their understanding and obtain their written signature. The voice recording only commenced after a consent signature was obtained. Two recording devices were used during most of the interviews. The primary unit was a digital voice-recording device (Olympus VN-2100PC) and a back-up recording was simultaneously undertaken with a mobile phone. In a few instances, the primary voice-recording device was not available (due to spontaneous meeting arrangements initiated by the interviewee) and only a mobile phone recording was taken. There was no degradation of recording quality noted. All transcriptions were provided to interviewees for validation and again informing them of their right to withdraw from the research. Only a few minor corrections (e.g. product names, acronyms) or queries were received from the interviewees.

Recordings of workshops were also made, but due to the use of a small personal recording device and excessive background noise, accurate transcriptions were not possible. These workshop recordings were used to facilitate the production of journal notes and memos, whereby the themes and ideas from the workshop were written down, and researcher thoughts, reflections and insights were also recorded.

The use of memos, sometimes referred to as field notes, has been described as ‘an ongoing stream-of-consciousness commentary about what is happening in the research, involving both observation and analysis’ (Eisenhardt, 1989, p. 539). They are an integral part of the grounded theory process and should begin with the first coding session and continue until the end of the research (Corbin & Strauss, 1990). Eisenhardt (1989) advises writing field notes based on impulse and considering questions such as ‘What am I learning? How does this case differ from the last?’ (p. 539). Glaser (1978) suggests

that one should write 'openly' and that, without using memos to theoretically write up ideas, the researcher is not actually doing grounded theory.

In this research, a formal pilot study was not undertaken since the research question emerged and was developed from the literature and the data analysed from the organisation (Wallace & Roberts, 2008). Another reason for not undertaking a pilot study was because the author did not want to utilise his valuable interviewee resources. The first interview was performed with a colleague in the case study organisation with whom the author was on familiar terms, and incorporated all of the planned methodology, i.e. introduction, explanation and signature of the statement of informed consent, use of interview guide, recording and transcription.

The process and transcription for the first interview were scrutinised by the author as suggested by Yin (2009) in order to refine 'data collection plans with respect to both the content of the data and the procedures to be followed' (Yin, 2009, p. 92). This first interview took around an hour of which approximately forty minutes were transcribed. The other twenty minutes or so covered the introduction, including signing of the statement of informed consents, as well as closing remarks and explanation of the upcoming activities, i.e. transcription review. Fortunately, no major gaps, weaknesses or major areas for improvement were highlighted.

It was also highlighted to the interviewee that the interview guideline was basically that: a guide. As the interview progressed and the introductory formalities were covered, one of the main objectives was for the interview participant to describe their experiences and tell stories. The interview guide was semi-structured to ensure that the main topics were covered; however, the author did not want to suppress any emerging themes which might evolve from the conversation.

The author acknowledges the ongoing debate amongst the various forms or schools of grounded theory with regards to variations and contradictions, but does not lean towards a specific school of thought. The author does, however, aim to preserve the integrity of grounded theory and undertook the 'classical' procedures to encompass 'the joint collection, coding and analysis of data, theoretical sampling, constant comparisons,

category and property development, systematic coding, memoing, saturation, and sorting...consistently endorsed by both Glaser and Strauss' (Jones & Noble, 2007, p. 100).

4.4. Data Analysis

In order to perform content analysis of interview responses, several qualitative data analysis (QDA) software packages are available for qualitative researchers to assist with data coding, analysis and identification of emerging themes. Latonio's (2007) qualitative study exploring the impact of organisational culture on PM used NVivo, whereas Soffe (2002) used NUD*IST for his research to test Weick's (1995) seven properties of sensemaking in an organisation's framework.

There is, however, debate on whether the use of software applications to perform data coding and analysis could be in fact an advantage or a hindrance. Although the software may facilitate data storage, coding, retrieval, marking up, tagging, sorting and reorganisation, the actual analysis is still performed by the researcher (Patton, 2002). Creation of categories, segmentation and coding, together with retrieval and collation is also carried out by the researcher (Basit, 2003).

Other disadvantages to using qualitative software as described by Creswell (2007) includes learning how to run the program, the possibility of placing the researcher at an uncomfortable distance with the data, and realising that the purchased software may not have the required capabilities.

This being the case and with personal preference, the author initially chose to limit the use of any computer-aided QDA software, and mainly used Microsoft Office to perform any necessary automation. Manual data analysis has also been used in other doctoral studies, for example to establish an understanding of how knowledge workers construct their workplace value identities (Praner, 2008) and understand the meaning and essence of learning and knowing construction as perceived by industry professionals (Blaylock, 2009).

In following the data analysis methodology of doctoral researcher Sheehan (2000), Microsoft Excel was used to store and view narrative extracts in a matrix. These extracts were then used to identify common and unique themes and were then categorised accordingly.

The matrix of common themes method, known as an 'interpretation worksheet', was also used by White (2007). This was used for further reflections on the meaning of phrases and understanding of participants' and group experiences.

As data was collected, a review of existing collection and analysis methods was reviewed in order to determine the most appropriate approach. It was later determined to enlist NVivo QDA software to facilitate the analysis process, supplemented by Microsoft Excel.

The use of Microsoft Office products was purposely chosen as it was intended that the research data and analysis, subject to confidentiality restrictions, could be made accessible to the research site and the research methodology would be more readily available to the business community. Therefore the use of the 'interpretation worksheet' would not only become a reflexive tool for the author, but could also be used as a reference for the participants and the organisation.

The seminal works of Anselm Strauss and Barney Glaser in their publication of '*Awareness of Dying*' has been credited as the origination of classical grounded theory (Creswell, 2007; Locke, 2001; Miles & Huberman, 1994). However, their 'principal aim is to stimulate other theorists to codify and publish their own methods for generating theory' (Glaser & Strauss, 1967, p. 9). Through the author's experience in the case study organisation, there was continuous zigzag interaction between the literature, data collection and data analysis.

Eisenhardt (1989) posits that this frequent overlap of data analysis with data collection is central to shaping good hypotheses as it allows one to assess how well the emerging themes align with the data in leading towards an empirically valid theory. One may make legitimate adjustments to the emerging framework or methodology, e.g. additional data source or questions, based on supporting, or lack of, supporting evidence (Sutton &

Callahan, 1987). For data analysis, the author referred to the iterative process as presented by Eisenhardt (1989):

- analysis within case data – to become intimately familiar with the data;
- search for cross-case patterns by using divergent techniques – to improve the likelihood of accurate and reliable theory;
- shaping the emerging theory in alignment with collected evidence – to refine construct definitions, validity and measurability;
- comparison of the emerging theory with the extant literature – to strengthen internal validity, wider generalisability, and higher conceptual level.

This was supported with the development of interpretative and reflective memos. Reflection is a critical part of the process as reflection on the data collected ensures we find a focus for analysis, and reflection on the experiences can lead to much insight and ideas (Dey, 1993). This zigzag approach allows one to promote an interpretative framework which is based on the researcher's interaction and aligns closely with the phenomenon under study (Locke, 2001). The zigzag process as described by Miller and Salkind (2002) and Creswell (2007) – out to the field to gather information, analyse the data, back to the field to gather more information, analyse the data, and so forth – evolved for the author as illustrated below.

Literature	**Data Collection**	**Data Analysis**	**Reflect / Review**	**Comments**
Knowledge types, Project management typologies Research design				Preliminary literature review [1]
	First ('pilot') interview	First ('pilot') interview		
			Interview technique Interview guide Themes, issues	Preliminary coding
	Interview 2	Interview 2		Preliminary coding
	Interview 3	Interview 3		Preliminary coding
		Interviews 1–3		

Note 1: The preliminary literature review was undertaken as a process to get a general idea of which areas of the phenomenon were not well understood and where to attempt to gather information. It was aimed at becoming more 'context-sensitive' and focused, rather than intended, or expected, to form a preliminary theory.

Literature	**Data Collection**	**Data Analysis**	**Reflect / Review**	**Comments**
			Themes, topics, issues for interviews 1, 2, 3	
Review of emerging themes (1–3)				
	Interview 4	Interview 4		Preliminary coding
	Interview 5	Interview 5		Preliminary coding
	Interview 6	Interview 6		Preliminary coding
	Interview 7	Interview 7		Preliminary coding
			Review analysis method, need for QDA software and review emerging themes	
	Interview 8	Interview 8		
	Interview 9	Interview 9		
		Interviews 1–9		Analysis using MS Excel
			Themes, topics, issues for interviews 1–9	
Review of emerging themes (1–9)				Literature review for emerging themes from interviews 1–9
			To arrange supplementary workshop to test some of the emerging concepts	
	Interviews 10–12	Interviews 10–12		Preliminary coding
	Interview 13	Interview 13		'Outlier' interview [2]

Note 2: An interview was undertaken with a contract member of staff who had approximately ten years of consulting and PM experience in the financial services industry. As a contractor the research participant only had five months of work experience within the case study organisation. This interview was used in order to assist in the research validity to identify if there were any particular outstanding or conflicting themes.

Literature	**Data Collection**	**Data Analysis**	**Reflect / Review**	**Comments**
	Interviews 14–16	Interviews 14–16	Introduction of QDA software	Introduction of NVivo software
			Themes, topics, issues for interviews 1–16	Preliminary coding
Review of emerging themes (1–16)				Literature review for emerging themes from interviews 1–16
	Workshop 1: Open Space	Workshop 1: Open Space	Theme: Connectedness	24 attendees Gain momentum for café workshop and identify interviewees
	Workshop 2: World Café	Workshop 2: World Café	Theme: Success and Diversity in Projects	11 attendees
			Similar /different themes for past interviews and workshop	
Review of similar /different themes for past interviews and workshops			Central phenomenon identified?	
		Build preliminary model		Preliminary
		Establish links between the data and the literature, building on the preliminary model		Preliminary

Literature	Data collection	Data analysis	Reflect / Review	Comments
	Interviews 14–21	Interviews 14–21		Preliminary coding
	Workshop 3: World Café	Workshop 3: World Café	Theme: Success and Diversity in Projects	24 attendees
Review of similar /different themes for past interviews and workshops				
		Proceed with more detailed analysis using interviews 1–10 and NVivo QDA	Use interview quotations to supplement the analysis	Intermediate analysis
		Proceed with more detailed analysis using interviews 1–10 and NVivo QDA	Use interview quotations to supplement the analysis	Intermediate analysis
Revisit literature based on the intermediate analysis to establish links				Work with preliminary model and link with literature
		Identify logical weighting scheme around the categories	When do people move to towards the central phenomenon?	
		Reasons and motivations for the central phenomenon		Linking knowledge to the central phenomenon
		Proceed with more detailed analysis using interviews 11–21 and NVivo QDA	Use interview quotations to supplement the analysis	Intermediate analysis, minus 'outlier' interview 13.
		Extend intermediate analysis for the 20 interviews	Diagrammatical representation of causal factors	Factors leading to the central phenomenon
		Preliminary theory building based on Strauss and Corbin's paradigm model		Model: Context, Phenomenon, Cause, Outcome Intervening, Interaction,

Table 4.1: The research (zigzag) process

The analysis process undertaken by the author is described by Morrow and Smith (2000, p. 201) as a cycle 'between the inductive process of immersion in the field and discovery of categories and themes, and the deductive process of testing those themes and categories against existing and newly collected data… that loops as often and as long as needed to bring the analysis to a coherent conclusion'.

There was a need to revisit the coding as these emerged and developed and as the experiences in the field continued. Some codes would become invalid or would not fit, whilst others became more dominant and common, or even evolved too much so that they might need to be sub-coded (Miles & Huberman, 1984). There was also the need to reconstruct the preliminary framework as new insights emerged, and different ways of viewing the data set arose (Lincoln & Guba, 1985).

With respect to coding there are different views on what level of detail one should abide by – line-by-line, word-by-word or sentence-by-sentence? For the analysis the transcripts were scrutinised line by line as suggested by Strauss and Corbin (1990) although in practice the unit of analysis could be 'bit-by-bit' (Dey, 1993), representing a sentence or multi-sentence portion as indicated by Miles and Huberman (1994).

Preliminary analysis and coding were normally performed a few days after the interview and in the majority of cases prior to the next interview. At the early stages, the main focus was to perform a thematic analysis with the aim to: 1) examine commonality, 2) examine differences and 3) examine relationships as this 'provides a way of linking diverse experiences or ideas together, and of juxtaposing and interrelating different examples and features of the data' (Gibson & Brown, 2009, p. 129).

The preliminary analysis was performed directly on the Microsoft Word transcription printouts and consisted of handwritten marginal remarks or 'memo notes' and comments at the bottom of the transcriptions. The comments took into consideration the following:

- logistical information such as time and location of interview;
- brief summary of the transcription;
- salient themes – commonality, differences, relationships;

- contextual information, e.g. acronyms, products, departments, roles;
- emotions, e.g. motivations and frustrations;
- interview technique, e.g. any items missed or difficulties in obtaining interviewee responses;
- items for follow-up interviews, e.g. emerging themes, what information should be sought;
- reflective remarks.

Miles and Huberman (1994) describe the use of a separate contact summary form; however, the author had a personal preference for maintaining such notes on the transcription printouts for ease of filing and retrieval as well as memory recollection.

Free-format memos were deliberately used throughout the research in data collection, data reduction, drawing and testing conclusions, and final reporting (Miles & Huberman, 1994). This is because the author did not want to restrict the spontaneous ideas and thoughts raised by him throughout the research process, no matter how 'fuzzy and foggy'(p. 74) they might seem. Coding, i.e. theme identification, as described above was also carried out at the early stages following Miles and Huberman (1994, p. 65) statement that 'Coding is…something that drives ongoing data collection'.

4.5. Researcher Bias

As mentioned earlier, the author was employed by the case study organisation during the period of study. This allowed the author to supplement primary data collected by pre-arranged interviews over a twelve-month period with observations and data obtained via various forms of artefacts. The author also had to be aware of any personal biases which could have an impact on the genuineness of his field experiences and the results of the research study.

Being employed by the organisation which served as the case study, the author acknowledges it would have been impossible to approach the research with a 'blank mind'. One method used to counteract the influence of personal biases was that of research protocol such as semi-structured interviews (Ellram, 1996). This allowed the

flow of the interview conversation to be directed by the interviewee, with the scope being facilitated by the interview guide. The researcher's intentions were also clearly explained to the interviewees.

Other methods of avoiding biases from the researcher as highlighted by M. B. Miles and Huberman (1994) included taking a low profile, using unobtrusive measures such as reviewing online forums and other recorded interviews within the case study organisation. This triangulation of data sources assists with addressing subjective judgment situations as it is 'aimed at corroborating the same fact or phenomenon' (Yin, 1994, p. 116).

It has also been argued that the grounded theory approach as advocated by Glaser and Strauss (1967) incorporates the phenomenological technique known as bracketing (Rennie, 2000). Bracketing assists the researcher to identify and examine biases in order to facilitate the 'self-conscious suspension of biases that may prematurely shape the conceptual categories' (Locke, 2001, p. 46).

4.6. Research Ethics

The research undertaken was the author's own work. On occasion, there was the use of an external workshop facilitator to assist with workshops hosted by the Project Link. The workshop themes were normally created by the author and the facilitator based on feedback from the Project Link committee and members. Prior to each workshop, a preliminary meeting was carried out to ensure that the workshop style and theme were compatible with the COP's interests and strategic theme.

The use of a facilitator allowed the author to look upon the workshop from the perspective of an individual and a group member, and identify the main themes and issues raised in any workshop. It was recognised that being the host and facilitator for a workshop could lead to a biased approach, which it was hoped would be avoided, and this was taken into consideration during the research process.

The analysis of the workshop outcomes were solely carried out by the author and the interaction with research participants was held within an ethical framework. The author

undertooks to act honestly and professionally, to maintain the anonymity of participants and other employees, to use the research data fairly and responsibly, and to maintain the security of all data and results.

Gathering of data by interview ensured participants' rights to confidentiality and privacy whereby participants could withdraw at any time. Any participation in the research was totally voluntary, and the aims of the study explained. Care was taken with any participant's quotations, to limit the risk of identifying them.

Transcriptions of the interviews were reviewed with the participants to verify accuracy with the option for them to delete any information or add further information in hindsight. The opportunity for the research subject to peruse and comment on the author's analysis and interpretation of the data, or even withdraw the transcription, was provided.

This chapter has provided an overview and brief discussion around the grounded theory approach. The data collection and analysis method was also described briefly, as well as the researcher bias and ethics. An overview of the data analysis and the resultant central phenomenon which evolved from the data follows in Chapter 5.

CHAPTER 5. RESULTS

Marshall and Rossman (1999) describe the typical qualitative data analytical process as falling into six phases:

1. organising the data;
2. generating categories, themes and patterns;
3. coding the data;
4. testing the emergent understandings;
5. searching for emergent explanations;
6. writing the report.

Although the grounded theory approach was originally devised by Glaser and Strauss (1967), who later parted to develop their own different approaches, with Strauss moving to a stage-based coding and Glaser to a more general hermeneutic approach (Grbich, 2013), there are still some constants amongst the versions. These include the constant comparison of data to develop concepts and categories; the gradual abstraction of data from the descriptive level to higher-order theoretical categories; the use of theoretical sampling as opposed to purposive sampling; the use of theoretical memos to track the process; and the saturation of data which requires the researcher to stay in the field until no new evidence emerges (Rennie, 1998).

The data collection process in grounded theory is a back-and-fro process of gathering data from the field, analysing the data, going back to the field to gather data, and so forth. Data should be analysed once gathered, and not after all the data has been collected. The process of taking information from data collection and comparing it is known as the constant comparative method (Goulding, 2002; Silverman, 2010).

The analysis of data adopts the three steps as posited by Strauss and Corbin (1998) and discussed earlier in section 4.2. This includes:

1. open coding – coding the categories for major categories;

2. axial coding – identification of one core phenomenon around which one creates categories;
3. selective coding – taking the model from the axial coding paradigm one develops propositions or assembles a story to interrelate the categories in the model.

The use of the constant comparative method to discover codes results in a substantive theory. This substantive theory is developed from the work in a particular area and 'does not attempt to explain outside the immediate field of study…[or]…try to generalise with explanations of situations for which there is no data' (Goulding, 2002, p. 46).

5.1. Open Coding

The research commenced with a general objective to find out about and understand, with a neutral mindset, tacit knowledge in knowledge intensive projects. The open coding process forms the initial data analysis stage and requires the breaking down of the data into distinct units of meaning (Goulding, 2002). Using the full transcription, the text was analysed line by line in order to identify key words, phrases and themes that represented the participant's account of the phenomenon under investigation.

Memos are 'the theorizing write-up of ideas about codes and their relationships as they strike the analyst while coding' (Glaser, 1978, p. 83) and were used at the beginning and throughout the analysis. They are regarded as 'one of the most important techniques for developing your own ideas' (Maxwell, 2005, p. 12) and 'especially crucial when you are taking a strongly inductive approach' (Miles & Huberman, 1994, p. 74). Formal methods of memo-taking have been described; however, the author took memos in various formats on various recording media, e.g. written transcripts (described earlier), mobile phone, computer, notepad, Post-its. This was in order to facilitate spontaneity and imagination, and took into consideration advice from Miles and Huberman (1994). This advice included giving priority and getting down the musing in any form, carried out throughout the research, and being able to be locatable and 'sortable'. Dey (1993) also advocates memoing as a creative activity which may be suggestive or analytical and Punch (2009, p. 180) asserts that 'coding and memoing provide the building blocks for…qualitative analysis'.

At this initial stage, over 3,000 segments of data were analysed and four main categories identified: the environments of the organisation, project and knowledge, as well as the project practitioner themselves. These are summarised below to include sub-theme constructs.

Level 1	**Level 2**	**Attributes**
Organisation		
	Complexity	Lines of business, communication channels, politics, culture
Project		
	Tools	Availability, standardisation, attitude, usage
	Methodology	Standardisation, attitude, usage
	Complexity	Attributes, environment
	Types	Change, web, execution, recommendation (consultancy), process improvement
	Success	Personal, team, organisation
	Issues	Resistance
	Culture	Unified, complex
Knowledge		
	Types	
	Culture	Acquisition, sharing, transfer
	Emotions	Attitude
	Infrastructure	Communications, IT, connectivity
	Attitude	Training, knowledge culture, sharing
	Issues	
Project Practitioner	Project role (interviewee)	Coordination, training, involvement

Table 5.1: Preliminary codes from performing open coding for first three interviews

Some of the emerging categories are described further in appendix D with respondent quotations.

As some of the key themes emerged from the interviews and conversations, accompanying thoughts also emerged, some of which are as follows:

- The organisation appears to push various standards on employees. The uptake is not particularly successful and one could investigate how this could be improved upon.
- The organisation is very complex, not only in terms of size, but also in business units. Each business unit is most likely to have its own attitudes and practices on how knowledge is best used and disseminated. Organisational cultural differences would only complicate the issue(s).
- How can regional/globalised best project knowledge management be attained?
- Are there any common 'pain points' that are being experienced by the project professionals (interviewees)?
- What makes a project 'rewarding' with respect to the project professionals?
- What emotions are expressed in the course of project delivery?
- What difficulties are identified in trying to attain knowledge and contacts relevant to project delivery?
- How to improve on the people issues related to projects?
- What environment/conditions are conducive to knowledge sharing?

At the initial stages of the research, it was understood that more codes would emerge as further conversations with organisational members occurred and more data became available. This primary data was not be restricted to the interview respondents, but was also gathered from the observations and 'informal' interactions, e.g. conversations and meetings with other members of the organisation. Secondary data was also obtained throughout the research in the form of project-related documents, videos and internal communications on the company intranet. This triangulation of data sources is 'aimed at corroborating the same fact or phenomenon' (Yin, 1994, p. 116) and to address potential construct validity, i.e. subjective judgment problems.

Further to this, the author constantly reviewed the research question(s) as the codes were identified, developed and grouped with respect to the considerations set out below. As stated by Creswell (2007, p. 43): 'Questions change during the process of research to reflect an increased understanding of the problem':

- How do participants enact the very messy system of project management tools?

- What is important to the participants and what is not?
- What irritates/frustrates the participants and how do they work around the situation, ordo they not?
- What are the participants' priorities?
- Any other emerging themes, e.g. resistance, proactive improvisation, resignation?

At the early stages, some of the main themes that were carried on into the next set of interviews, and in gathering more stories, were on how the participants coped, improvised, resisted or invented new procedures within their working situation.

As more interviews and concurrent analysis were undertaken, the table of codes and relationships was continually reviewed and amended. Interviews continued until a point of saturation was determined, i.e. when repeated categories continued to be highlighted and new categories were increasingly difficult to identify, despite undertaking more interviews. The determination of saturation is a 'tacit understanding' (Suddaby, 2006, p. 639) where Glaser and Strauss (1967, p. 62) state: 'The criteria for determining saturation...are a combination of the empirical limits of the data, the integration and density of the theory and the analyst's theoretical sensitivity'.

As more interviews were analysed, an aspect of the data that appeared more definitive was that of participants taking short cuts, inventing alternative procedures and finding other methods to deal with the perceived complexity of their role and the working environment. This provoked the author to look for further evidence of employees' 'muddling through' in both literature review and interviews.

5.2. Axial Coding

Axial coding forms the second level of data analysis and reassembles the data that was fractured during the open coding process in order to form a more precise and complete explanation about phenomena. The coding paradigm as introduced by Strauss and Corbin (1990) was referenced for 'identifying the variety of conditions, actions/interactions, and consequences associated with a phenomenon' (p. 126). As mentioned earlier, during and following the open coding process, additional literature was reviewed in order to

understand more about the emerging theme of 'muddling through'. From this, the central phenomenon of bricolage evolved from the data and the axial coding process was carried out with this respect.

Five causal conditions around the emerging phenomenon of 'muddling through' evolved through the iteration of data collection, analysis and literature review. These causal conditions of 1) external environment; 2) organisational environment; 3) nature of the task; 4) role; and 5) knowledge capability are introduced with the use of poignant interviewee quotes from the transcripts to represent supporting evidence and to highlight the exploratory findings. The respondents to which the quotes belong are indicated in brackets. For example, '(#7)' indicates that the quotation was provided by interviewee number 7.

5.2.1. Environmental Context – External

In order to understand the contextual conditions which may influence the central phenomenon and create the set of circumstances or problems that occur and to which various actors may need to respond, we first consider the environmental context from an external aspect.

As a global financial institute with commercial, retail, and investment banking operations there are many regulatory and economic aspects which influence the business environment. From a regulatory aspect, the institute is regulated by both local regulatory and overseas bodies depending on the product portfolio and the country of jurisdiction within which it operates. Such bodies include the Financial Conduct Authority, Hong Kong Monetary Authority, Monetary Authority of Singapore and the Securities & Exchange Commission.

> '…there are certain things beyond our control, for example, the clarity of the requirements, because the regulatory requirements typically are very ambiguous. And for <The bank> we operate in so many jurisdictions, and very often different jurisdictions have different requirements – sometimes in conflict of requirements!' (#7)

'…OTC (over the counter) clearing, which is a new business model. It's a new regulatory requirement…' (#9)

'…cross border data transfer. You know, data's moving from country to country, to ensure that Compliance and everyone's happy. We have to make sure when we outsource to Singapore, the MAS (Monetary Authority of Singapore) has to be involved…' (#14)

Technology has a wide ranging effect on the project environment where a chief executive officer within the bank states:

'New technology is having a profound impact on how we serve our customers. How we engage with them, how we connect, how we communicate with them.'

This aspect is supported by a chief information officer who states:

'We need to change the way we work in <the bank>. We need to transform the way we work…because our customers are demanding the bank changes the way we work with them. Technology is driving massive changes in our customer behaviour through social networking, through mobility, thorough cloud computing, through big data. These are the types of trends that are forcing our customers into a different way of operating in their lives and therefore we need to change the way we deliver our services to them as well.'

From an economic aspect, these also influence the organisation, and subsequently the respondents:

'…when Cyprus was gone bankrupt, we have to have a set of emergency changes in the front office. These changes effectively impact us. We have to be ready. It's not something we can negotiate, we cannot do that. We have to drop everything else and just be prepared to do that.' (#7)

'…the Latvian Lat is moving to the Euro on first of January. So from a data perspective, that's a huge change. So in our team alone, we have to change any security master, we've got to set up a new one, get the corporate action conversion, implement a corporate action to convert the holdings from this one to the other, and then convert all the positions. We have to test price feeds, we have

to test FX (foreign exchange) feeds, and there's loads of work in the background that goes on…' (#14)

Further, within Asia where the organisation is supported by several offshore resource centres, there is a competitive environment as far as knowledge aspects are concerned and the need to gain knowledge as well as retain and recruit talent:

> 'It's very hard for us to recruit people with the exact skill sets that will be required. So we spend a lot of time training, and too much time trying to retain people, because people come in, and then they realise the IT industry is so "moving" and then they want to move out.' (#10)

> 'What's available in terms of the talent pool, it's actually very shallow. And they're probably already working in a top bank, or they've got options. They're looking at different industries, the banking is competing with other industries…' (#17)

From both an economic and regulatory aspect, these external influences are imposed on the organisation as external risk and are outside the control of the project team and organisation. These are generally more difficult to predict and manage.

5.2.2. Environmental Context – Internal (Organisational Characteristics)

With regards to the internal working environment, this concerns the organisational presence which crosses both geographical and cultural boundaries, and the operational environment in terms of its organisational structure and systems.

Being a global financial institute, respondents spoke about the complexity of the organisation and the geographical and cultural differences.

From the perspective of organisational structure:

> 'Because we are too complicated, we have global level, we have regional, we have local, and people's knowledge is different.' (#18)

> 'I guess because the fundamental reason is because the bank is too big. Every department, every business have their own ways of doing things, so it's different everywhere.' (#2)

All of the respondents worked in virtual teams or were involved in projects which spanned geographical boundaries. This would have different effects under different circumstances:

> 'Currently I am in Hong Kong, others are in Sri Lanka, Cairo, London, different places, so we are located in different places' (#1)

> '…they were quite massive teams, like I said, in China, in Hong Kong, in UK, US, Canada, Mexico etc.' (#10)

As the organisation's head office is based in London, there were some issues highlighted:

> 'I think that when the Group implements something from London, they don't take into account the cultural differences in the regions. So they will implement something globally, but they don't actually realise the impact of that in different places.' (#4)

> 'Group telling us what to do, but they never tell you how to do it.' (#6)

Working across geographical and cultural boundaries did also present other issues:

> 'I visited two locations in Manila and China for example…After work we go out and spend some time, and getting to know each other. This was the sort of bonding I tried to do with the more distributed teams…The culture is a bit different here in Hong Kong. I think general work hours would be 9am–7:30pm, or 9am–8pm. People are so busy, that they spend very little time, apart from that. And then they work so late they'd want to rush back home after work.' (#10)

> 'He found out from AP [ASIA]. We are very accommodating, we complain, we suffer, but we accept!' (#18)

> '…this project is involving many people, the people are from different background in the team. And also most of them are not like fresh graduate, they have their own way of thinking.' (#21)

Management style and support were also discussed with respondents. From a management support perspective, there was relatively little evidence that respondents were supported from a senior management level. Managerial support was illustrated by the respondents themselves in the form of camaraderie and teamwork where they had a role as either a team leader or team member:

> ‘I was helping the team, guiding them on starting the project then I had to leave.’ (#1)

> ‘I think it’s a matter of hard work as well, as there are a couple of things that we do for bonding.’ (#10)

The role of the respondent appeared in many cases to be taken for granted, whereby the project was assigned upon a management directive and in some cases under a ‘finger pointing’ and ‘blame’ environment:

> ‘The biggest problem that they have right now is in the people at the top is not buying into these ideas, and they are actually trying to…argue with each other about who is responsible, and this and that, and blaming each other.’ (#2)

> ‘My manager said <Name>, you handle this by yourself. I’ve assigned it to you. You’re the project manager. It was like that!’(#15)

Management was also described as deliberately testing respondents with regards to their knowledge and capability:

> ‘I still joined at the early stages of the project…My manager was telling me like, I want to see how, how much you know about this subject.’ (#16)

> ‘…so what was given to me was a small component that they wanted…I guess to test my level of knowledge and my ability…’ (#17)

Management also used ‘tactics’ in gaining traction to initiate projects:

> ‘The NGO (non-governmental organisation) partnership came about because I was asked if I would volunteer.’ (#4)

> ‘<COO> actually said “You have to do it, but you have no extra resources to do it. So if, you can’t find a way to do this, I will ask someone else to do it!” …Oooohh…I hate that! Because it seems like a failure to me, so I said … I’m going to do it! <laugh>’ (#6)

Organisation strategy influences which projects are undertaken and the infrastructure which it should be based upon:

> ‘It’s a kind of a line of projects that will start coming on the same type of platform, so we have to build the team…and it’s going to grow more.’ (#1)

Respondents discussed projects whereby the whole operations were to be migrated offshore:

> ‘…had to transform the staff, transform! Because the jobs would be transferred to the Mainland, in the near future… the start of the deployment was really difficult…It was like…how do you sell this member of staff to another department?’ (#15)

> ‘…the organisation is originally thinking about centralising the operations to…have a central processing centre and then to support so supposedly the ideal model is that <location>, will know, as a whole picture of the system, how to manage it. Unfortunately, it didn’t happen, and then it goes back to the individual countries.’ (#18)

In addition to the complexity of the global organisational matrix structure, the infrastructure systems which the respondents were involved with were also described as complex:

> ‘I think we were already missing many deadlines. Because there were several systems that we never thought would become, be so complex…we had to get in touch with many teams.’ (#5)

> ‘For one site, say for example, in Hong Kong, we have 70 plus, source systems, feeding into the general ledger!’ (#12)

> ‘Actually we use a lot of <bank> systems. For example <system> is the main system and they need to use the surrounding channel systems, like Internet Banking system, ATM channels, ATM banking systems, and also card systems, something like the supporting systems.’ (#20)

The organisation does provide a standard for the use of PM tools and methodologies; however, this is not mandatory across the whole organisation:

> ‘Even though the bank has tried to put in a lot of standardised tools, for project management, for example, RBPM template and those things…It depends really on where you are working. Because the bank is so big some departments I know

follow it very clearly...but some don't. So I guess, I mean, it depends on what kind of project.' (#2)

'The user side like to use MS Project, but it's not allowed…IT doesn't allow it. They insist on Clarity, but they (user side) cannot use Clarity. They are not used to it.' (#3)

Limitations on the provided PM tools and methodologies were highlighted by some respondents:

'I think using the tool is …wasting… my time…things like …the Gantt chart…<sigh>. Pretty, it looks pretty, but I'd prefer to use Excel to build it myself!' (#15)

'I think Open Workbench they use it in Asia for projects, you know, the project planning. There's limitations with it because it's really a time booking system!' (#17)

Issues and frustration were, however, mentioned when a lack of standard approach to the use of PM tools or methodology was taken:

'They don't follow anything at all! There is nothing! No standards, people just run whatever they want to do. All is different, no templates. People just create or do whatever they think is useful. Nobody really looks at dependency, interdependency of projects. Nobody looks at whether, how a project should do or not, whether it affect other projects, timeline, nothing, nothing!' (#2)

'…we always repeat errors, because of different people handle differently, or lack of exchange of information coming…' (#18)

Although frustration with the lack of PM tools or methodology availability was noticed, respondents were still using alternative methods, or even creating their own:

'Tools wise, we usually follow the bank's practices, for example, project status reports, we might use Clarity, which is required from the portfolio. And sometimes we also develop it ourselves.' (#9)

'What I realise at the bank, is that sometimes usage of tools is limited, due to legal or compliance bindings. In terms of project management, I have used MS Project, but mostly I found where we had, you know, a very scaleable self-structured

> methodologies, I've managed to create my own project management tools, using Excel.' (#10)

Despite the facility to use standardised organisational structured PM methods and tools, this did not necessarily have to be a factor in being able to deliver successful projects. Similarly the need to have formalised PM training prior to delivering projects was not a mandatory requirement:

> '…twenty years in projects… I've not gone for any formal training in projects. It's all through experience, and from the banking guide, you know, on how to run projects. So that's the basis of my involvement in projects. But so far to date, I can proudly say that none of the projects that I have managed have gone haywire or screw up, because of the way it was project managed.' (#11)

> '…there are many other people in the bank in the IT area. They don't have PMP [Note: Project Management Professional certification] but they do, they can be very good, they ARE very good project managers!' (#21)

Even if some of the respondents did attend formal company-provided training, there was a less than positive response. Participants commented on the lack of value, and the preference to locate necessary knowledge themselves:

> '…to be honest. Even though I attended some of these RBPM classes, I still don't really have a clue how these RBPM documents would be able to help me run my project better. I don't know. And none of these tools, that they have so called implemented, I don't really see how good it is, or how it can really help me run my projects.' (#2)

> 'I think even though we are IT people, but we do have training on project management related area. It's…but I think attending training is different from what you actually do…' (#21)

Further to the above illustration regarding the internal working environment, consideration also needed to be given to the influence from the internal project stakeholders, and the difficulties they might pose:

> '…there was some projects, where the stakeholders are not that easy. So managing the stakeholders is one major aspect, because sometimes they…change things along the way.' (#11)

> '…some guys will come up to you, project managers, and just say "implement this! Next week!" Without having any consideration, does it fit our model?' (#14)

There was also the influence or dependency on external vendors or consultants:

> 'A lot of third parties, a third party for design, a third party for servers, helping with the development…' (#1)

> 'There was no way we could deliver without both the suppliers together. But of course, I am the …middle man…' (#15)

Although there was some dependency on vendors and consultants, they were unable to provide a complete solution. There was a need to learn together with the respondents in order to come up with a workable solution:

> 'They [external consultants] come with the core setup concept, and of course they are experienced before they help other organisations implement the same system before. But they do not know much about <The bank> so we have to tell them how we work... So then together we'll customise it, and make it work for <the bank>.' (#16)

> '…But for this innovative project, I think the vendor, they are eager to work, make a contract with our bank, so that means they are quite helpful and deliver the knowledge. So it's not quite difficult to get some information from them. But honestly, are their system provided perfect? Actually no, but I think it's a continuous improvement.' (#20)

From an internal perspective, the organisational structure was complex as it spans geographies and cultures. The infrastructure which includes the provision of PM training, tools and methodologies, as well as senior management is not particularly conducive to the successful delivery of projects.

5.2.3. Nature of the Task

All of the research participants were project practitioners and are involved in the discipline of PM. The nature of the PM task concerns the successful delivery of projects, whereby project success according to the PMI (2008, p. 9) is 'measured by product and project quality, timeliness, budget compliance, and degree of customer satisfaction.'

Research participants spoke of their role which basically covered two major aspects. The first role was identified as being able to deliver a product or solution, and the second to solve problems. Participants described the need to deliver a product or solution as below:

> 'I see myself as the execution arm of strategy. So you have Group telling us what to do, but they never tell you how to do it.' (#6)

> '…developed some sales solution…We actually developed this system from scratch' (#16)

> '…you have to try to understand what they are trying to do with very limited information and then trying best use of your knowledge that you know about what the system can offer on a functionality wise and then provide some options, or solutions to them.' (#18)

As project practitioners, most spoke of the need to solve problems. The instruction or issue may have been provided by senior management (similarly as illustrated earlier) and the respondents would be expected to resolve the issue. In most cases there would be no guidance on how to resolve the issue, just the demand that the situation had to be resolved:

> '…if it's an issue you don't know how to find a clear answer how to do that online, so I have to try different approaches.' (#1)

> 'It was an IT issue, but in the end it was me that had to go around and …get everything done!' (#4)

> 'As far as they were concerned, you had to sort it out yourself!' (#15)

> 'So as a project manager, you're supposed to fix everything. Right? In order to make the project work. So now, it's like I have to see how…' (#21)

Further to projects being imposed by senior management, respondents were introduced to the project as new team members, or required to work on unique, first time projects:

> '…but within the bank there is literally no one. Since we were the first with this sort of setup I'd try to ask external party, but it does take a lot of time.' (#3)

> ‘Regulatory by definition views everybody on the same boat. So you just have to learn and read, or sometimes we invite some consulting companies to give us a seminar. Because it’s not something that has existed in the market for a very very long time…So we will only dive in where we identify where there will be direct impact to us.’ (#7)

> ‘It’s a new project team that I joined… the project, the system is new and the people are new…and so I was like a team lead.’ (#21)

New members to the team were not necessarily given any formal training or initiation to start them on the project:

> ‘We got more structured, more organised as we went through the project, I think. So initially, it was a bit disorganised, I mean I was just coming in, expecting someone to direct me. And no one did. I had to direct myself.’ (#17)

> ‘I’ve had a, like a mentor whose given me some links, like weblinks that I can go and learn, and get training from there… given me some access to workshop training, then you can see it on the public website and then you can access. And yes, so it’s pretty much self-training. But I think my team also supports me, like giving me some actual formal training outside, but outside the bank. Because I don’t think the bank supports that kind of workshop training.’ (#19)

5.2.4. Inherent in the Role

The PMI (2008, p. 13) defines a project manager as ‘the person assigned by the performing organization to achieve the project objectives’. Although not all the interviewees were titled project managers, they did all have a primary role in supporting the organisation to achieve the project objectives.

Further to those aspects which are related to the task, there are some aspects inherent in the role. Practitioners spoke about three prime attributes of their role: those of being facilitator and team builder, and the need to have domain knowledge.

The need to be a facilitator was highlighted by respondents as described below and also identified by Cleland (1995):

> ‘From IT’s point of view, I was the business. But from business’s point of view, I was IT. It was really weird <laugh>’ (#4)

> ‘All we can do is facilitate the conversation. Sometimes it works, sometimes it doesn’t ...but I can only advise them or I can only tell them the observations. Whether to do it, it’s out of my control, which is frustrating!’ (#6)

> ‘...we interface with the front office, we know what they are up to. We also interface with the risk global team and know what they are up to. And between the front office, and the global team, they don’t talk to each other.’ (#7)

As illustrated above, the respondent was also regarded as a ‘middleman’. It was also necessary to build up the team:

> ‘…people management is a component that also needs to be looked at for projects. If you want a successful project, your team of people must be well taken care of.’ (#11)

> ‘…the team was quite close, and then, yeah, we sort of find out information together, brainstorm ideas together, so I can think it’s a very wonderful experience. Although it’s hard work we have to! A lot of overtime, but it didn’t really matter!’ (#16)

> ‘I should say that the additional target that I want…that I want to meet a standard, that my project team, worked in an harmonic environment. So not much conflict, with the team, or with the other people, and not any complaints from the business team, or from others.’ (#20)

The role of project practitioner also identified the need to have a broad and varied understanding of domain knowledge in order to adapt accordingly to provide a solution or recommendation:

> ‘You are assigned, in maybe, looking up a particular area to enhance that area…so you have to go and manage that, get feedback.’ (#11)

> ‘…as you approach or talk to more business people, you start to realise something they don’t understand. Because before you say, “Oh, it’s very obvious” and why they don’t understand. But then as you talk to them, and you realise, you know, you can understand why they can’t understand!’ (#21)

Participants also described their involvement in projects as an 'outsider' or additional pooling resource:

> 'I'm not an expert in the particular products, or asset class, right? The reason why most of the clients want us is to help them look at the processes is because they want a third opinion...someone to, who is not involved in the process, who doesn't know the process very well, and to look at it from a totally different angle.' (#2)

> '...we also act as a resource pool, if for example, Finance resources project, if they don't have resources, might be, we want to act as another pooling resource.' (#9)

5.2.5. Knowledge Capability

Knowledge capability can be described as the ability to utilise knowledge assets to acquire, create, transfer, exploit and protect knowledge through knowledge processes (Gold et al., 2001; Lee & Choi, 2003; Tanriverdi, 2005). As this research concerns an investigation into knowledge within projects, we took a more focused look around these knowledge aspects. Two main sub-themes evolved from the analysis based around the knowledge infrastructure and the knowledge culture.

There are many different terms to define knowledge infrastructure; for the purposes of this research we have taken the description from Maier et al. (2005, p. 73) which states

> *An enterprise knowledge infrastructure is a comprehensive ICT [Information and communication technologies] platform for collaboration and knowledge sharing …that fosters the implementation of KM [knowledge management] instruments in support of knowledge processes targeted at increasing productivity of knowledge work*. (Maier et al. (2005, p. 73)

Participants spoke of the infrastructure in terms of physical information repositories and support from their colleagues:

> '...there are a lot of really good manuals that you can read, and learn fundamentals about it, plus, then play around with the system, you can then ask the people around you, and at that time can get a lot of details.' (#2)

> ‘They had what they call a bible, so that was like mini, mini, like hundreds of pages…it was a physical document, yeah <laugh>, that I could refer. They also had an online version as well...also another source that I could go to is to, you know, the people I was working quite closely with, within the team.’ (#19)

> ‘...also they had various, different number of sites, intranet sites that we could go into, and that I could source the information from. So that’s one source that I could refer to. The other source of information was on like, SharePoint sites. It’s not on a particular intranet as such, but on a location that is shared amongst the team that I also refer to...’ (#19)

However, as teams are moved around, sometimes together, from one project to another, there may be a lack of documentation to support knowledge sharing or retention:

> ‘It wasn’t documented, formally documented as it should have been…I wouldn’t say that the whole process was enshrined in project management theory <laugh>. It was a bit of “JFDI”… Just Flipping Do It!’ (#4)

> ‘…it’s just knowledge in the team. So our team…the implementation team was bigger before, while we had the Hong Kong rollout and then it shrink into maybe half the size, but half the size of the people, were from the original team... So we were all involved in the first site, and we…we…yes, it’s just in our heads. We don’t have anything <laugh> documented, or…or …yeah, we are just aware that...’ (#12)

Further, due to the size and complexity of the organisation, it was reported that an understanding of the full picture was difficult:

> ‘…someone will have one year’s experience and they will do their routine aspects and they will get much knowledge about the entire process as such, and they won’t understand the entire thing that they do, to be very frank. So it becomes difficult for us…Unless you do process improvement and understand that aspect and if we had documentation of those critical areas that would have helped us.’ (#5)

> ‘…this type of thing is a new model. So quite likely most of the people don’t have the clarity… no one in the meeting have the full picture, so we just need to brainstorm.’ (#9)

Knowledge culture may be defined as a 'way of organizational life that enables and motivates people to create, share and utilize knowledge for the benefit and enduring success of the organization.' (Oliver & Kandadi, 2006, p. 8). Experiences amongst the respondents varied, but many suggested the barriers to gaining knowledge concerned the structure of the organisation rather than colleagues' negative attitude to sharing knowledge:

> 'No mentoring or nothing. You basically, don't understand you ask!' (#2)

> 'Because it was a secret project at that time...We couldn't tell anybody we were retrieving this information. I didn't ask either when we were working on it, we couldn't tell anybody!' (#3)

> '...I think with the bank, the networking is really important if you want to obtain knowledge. Some people will not have formal way to communicate. I think there is still room for improvement for a formal way of centralising knowledge. Make sure it's cascaded down to the next project… It seems contained within people. You may need to connect people to ask for help, to share.' (#9)

In order to develop one's domain knowledge, several respondents described the need to gain knowledge through on-the-job experience:

> 'Getting your hands dirty, having a coach. You know, when you go to a new job, you have someone assigned to you, and provide you proper training. The bank spends a lot of money on training. So you can always make sure that you have both access to the training, the manuals, and someone you can go to, and give you some guidelines when needed, and start with some simpler projects, then larger projects.' (#8)

> 'I've done six offshoring projects. And so have better results than the rest. I certainly learned lessons from these and so the last one I did was very successful. And that was a global one.' (#14)

Several respondents expressed an appreciation that facilitating knowledge-sharing discussions was important, but also highlighted difficulties in being able to achieve it:

> '…we have to design discussions about it. And you have something like, Ah, this looks good, is it something that we all kind of agree with that we can update the Style guide with this new…style?' (#19)

> 'We need, really some people, or some kind of knowledge management specialist, people with dedicated time to delivering through, what is the common element we can share. I think the concept is there, but you're right. The technical, and very practical problem. What to share? Why are you interested? How can we create a critical mass to discuss?…I think high level wise there is definitely, something can be shared, but how to practically make sure people interested. Make sure efficient, make sure that others share, not just talking. You can really transform it into knowledge capital. We are lacking that dedicated person to try to formulate the approach, formulate the way!' (#9)

Although respondents spoke about the need to gain and share knowledge, including some of the barriers to this, a positive attitude and environment were generally portrayed:

> 'I would actually share with them my experience and tell them what it is from a very high level perspective, and to explain to them how…I would give them this idea…because I know a lot of people in the bank, so I can still find a way to ask this person, and then another person, another person, and at least at the end, and connected.' (#2)

> '…it's so difficult but I think our bank, we have a lot of people experienced, and willing to transfer. And the good thing about this bank is the turnover is lower, compared to other banks…which means the knowledge can retain, relatively better than other banks can do it.' (#12)

> '…for me doing a PIR (Post Implementation Review), helps me to focus. And it also helps me to remember…It's so useful, and I think…it's worth it! And if you share that information, everyone learns from it!' (#14)

> 'You mentioned about difficulties or the challenges, but we always get the knowledge somehow, but sometimes it could take quite a long time…' (#21)

As mentioned earlier, during the open coding stage one of the dominant themes was how the participants coped, improvised, resisted or invented new procedures within their working situation. This main theme continued throughout all the other participant interviews and hence was taken as the central phenomenon to further investigate.

Leading up to this central phenomenon of 'muddling through', several causal conditions were identified through the second stage of analysis. These are:

- the external environmental context, such as the competitive, regulatory and economic aspects;
- the internal environmental context which concerns the organisational characteristics;
- the nature of the task, i.e. project management;
- aspects which are inherent to the role of a project practitioner; and
- the knowledge capability aspects to which the project practitioner is situated.

As mentioned in the earlier methodology chapter, there was a continuous zigzag interaction between the literature, data collection and data analysis. As the central phenomenon of 'muddling through' appeared more apparent, a more in-depth literature review was undertaken and the main highlights follow.

5.3. The Central Phenomenon: 'Muddling Through', aka Bricolage

During the literature review to investigate the emerging phenomenon of 'muddling through', the concept of bricolage was identified.

The term 'muddling through' has been synonymous with Lindblom (1959) and his works entitled 'The science of 'muddling through' (Hällgren & Wilson, 2007; Wilson, 2011). His works criticised the rational decision-making model in relation to official policy making in the USA and proposed that policy making should be understood as method of successive limited comparisons. He states:

> *That they sometimes practice it effectively and sometimes not may explain the extremes of opinion on "muddling through," which is both praised as a highly sophisticated form of problem-solving and denounced as no method at all. For I suspect that in so far as there is a system in what is known as "muddling through," this method is it.* (Lindblom 1959, p. 88).

Maybe due to the fact that the word 'muddle' is commonly associated with 'a state of confusion' (Merriam-Webster's Advanced Learner's English Dictionary, 2008), 'disorder' (Longman Dictionary of English Language and Culture, 1992) and

'mismanage' (Oxford Encyclopedic English Dictionary, 1991), where 'muddle through' has been defined as 'to reach successful results without having a clear plan or using the best methods' (Longman Dictionary of English Language and Culture, 1992), 'succeed by perseverance rather than skill or efficiency' (Oxford Encyclopedic English Dictionary, 1991), and 'to succeed in spite of incompetence or lack of understanding, method or planning' (Penguin English Dictionary, 2003); subsequent descriptions of Lindblom's method were referred to as 'disjointed incrementalism' (Hirschman & Lindblom, 1962; Lindblom, 1979).

The 'incrementalism' approach has however have been criticised for being 'insufficiently goal orientated and ambitious…[and]…is appropriate in only a narrow range of decision situations: where the environment is stable, no crisis is impending, the organization's survival is not at stake, available resources are not desperately short, and where current policy problems resemble previous ones for which the organization has experience' (Woodhouse & Collingridge, 1993, pp. 154-155).

Claude Lévi-Strauss' seminal 1962 book, La Pensée Sauvage (published in English as 'The Savage Mind' in 1966), introduced the notion of 'bricolage' as an analogy to describe a particular mode in which human actors relate to their environments. To contrast the sensemaking approaches of the bricoleur with an engineer, Lévi-Strauss asserts that an engineer has the capability to create new knowledge as opposed to the bricoleur who is:

> *. . . adept at performing a large number of diverse tasks; but, unlike the engineer, he does not subordinate each of them to the availability of raw materials and tools conceived and procured for the purpose of the project. His universe of instruments is closed and the rules of his game are always to make do with 'whatever is at hand', that is to say with a set of tools and materials which is always finite and is also heterogeneous because what it contains bears no relation to the current project, or indeed to any particular project, but it is the contingent result of all the occasions there have been to renew or enrich the stock or to maintain it with the remains of previous constructions or destructions.* (Lévi-Strauss, 1966, p. 17)

Ciborra (2002) describes bricolage as:

> *Bricolage (from the late Latin bricola catapult) means tinkering through the combination of resources at hand. These resources become the tools and they define in situ the heuristic to solve the problem. 'Let the world help you': bricolage is about leveraging the world as defined by the situation. With bricolage, the practices and situations disclose new uses and applications of the technology and the things.* (pp. 48-49)

Baker and Nelson (2005, p. 333) claim 'Lévi-strauss offered no specific definition of bricolage and scholars have applied his insights to a vast range of phenomena, also without converging on a concise or consistent definition'. Stating the 'scanty prior use of bricolage in organization studies' they 'developed an integrative definition of bricolage as making do by applying combinations of the resources at hand to new problems and opportunities.'

Baker and Nelson (2005, pp. 334-336) introduce the following three elements to their definition of bricolage, which may have a wide range of (positive, neutral or negative) outcomes:

- Making do – implies a bias towards action and active engagement with problems or opportunities rather than lingering over questions of whether a workable outcome can be created from what is at hand. This also includes a conscious bias to test conventional limitations.

- Combination of resources for new purposes – the combination and re-use of resources for different applications than those for which they were originally intended or used.

- The resources at hand – the possession of 'odds and ends' which may be physical artefacts, skills, or ideas that are accumulated 'on the principle that they may come in handy'.

Bricolage as introduced by Lévi-Strauss (1962) is generally referred to as 'entrepreneurial bricolage' (Baker et al., 2003; Baker & Nelson, 2005) or 'intellectual bricolage' (Cleaver, 2002; Domenico et al., 2010) although other forms have evolved from his original works.

Freeman (2007) considers learning as a process of epistemological bricolage, where knowledge comes through practice and the interaction with counterparts. This 'making sense' consists of 'piecing together' different kinds of information and experience in different ways so as to create something new from what was acquired second-hand.

Smith and Culkin (2001) describe the example of organisations being paralysed due to information overload. There is the need to combine tacit insights with the expertise of a bricoleur in order to 'assemble the 'information jigsaw' of available evidence into a sensible, meaningful picture' (p. 263) to facilitate decision making. Freeman (2007, p. 485) posits that 'learning consists in "piecing together" what they know from different sources in different ways' [Quotations in original] and may be referred to as epistemological bricolage. Information from diverse sources of 'varying quality, creatively pieced together' facilitated causal links to be made, and was regarded as being more valuable than one single piece of evidence (Whitehead et al., 2004, p. 819).

Johannisson and Olaison (2007) introduce the concept of social bricolage as the spontaneous collective organisation of resources from one's social structures, networks and memberships in order to cope with problem situations. Building on the fundamental concepts underlining bricolage, i.e. making do, a refusal to be constrained by limitations, and investigating bricolage in social entrepreneurship from various disciplines, Domenico et al. (2010) introduced three new constructs: social value creation, stakeholder participation and persuasion to form the framework for social bricolage. In this respect, social value creation refers to making social targets a priority, and stakeholder participation concerns commitment and response from stakeholders to support environmental and social needs, whereas persuasion concerns persuading stakeholders to acquire resources and support for social value creation.

Social bricolage may be used synonymously with network bricolage, which Baker et al. (2003, p. 270) use to illustrate the use of personal and professional networks in defining

the concept of 'network bricolage' which is the 'dependence on pre-existing contact networks as the means at hand'. This is in contrast to 'networking' which is regarded as a 'resource seeking' behaviour when one attempts to seek new resources from strangers.

Institutional bricolage as described by Lanzara (1998) is a form of institution building which may involve recombining and rearranging existing organisational components such as policies, functions and structures. Cleaver (2002, p. 16) also uses the term institutional bricolage to 'suggest how mechanisms for resource management and collective action are borrowed or constructed from existing institutions, styles of thinking and sanctioned social relationships' and the 'adaption of norms, values and arrangements to suit a new purpose' (Cleaver, 2002, p. 20).

Lanzara (1998) posits that institutional tinkering, or bricolage is frequently viewed as a second-best strategy. However, as a method of coping with complexity, it is a way to build and innovate in situations characterised by high uncertainty, risk adversity, lack of trust, political conflict, resource shortage and high sunk costs.

Organisational improvisation can be defined as 'the conception of action as it unfolds, by an organization and/or its members, drawing on available material, cognitive, affective and social resources' (Pina e Cunha et al., 1999, p. 302). It has been regarded as a deviation from existing practice or knowledge and seen as becoming more accepted as a means of achieving (Chelariu et al., 2002; Moorman & Miner, 1998) in problem circumstances. From a project context, it involves moving away from an agreed plan in order to accelerate the implementation of actions (Leybourne, 2006).

Although organisational improvisation has seen an increase in beneficial evidence within the management and implementation of change (Leybourne, 2006), it has been treated as an organisation dysfunction: an unintended outcome or as an organisation design failure (Lewin, 1998). The impact on organisational practices has witnessed both detrimental and beneficial results and requires one to evaluate the situation and identify the factors which will facilitate effectiveness (Baker et al., 2003; Flach, 2014; Vera & Crossan, 2004).

Moorman and Miner (1998, p. 698) define organisational improvisation as 'the degree to which the composition and execution of an action converge in time' and consists of a combination of bricolage, creativity and intuition.

Cunha et al. (2012) assert that improvisation facilitates adaptation to change where alertness to weak signals and imperfect information increase the condition for entrepreneurial action to occur. The capability to identify the need for change and responsive action even with a lack of planning and available resources, i.e. through bricolage, is regarded as an important source of competitive advantage.

Some authors use the concepts of improvisation and bricolage interchangeably (Pina e Cunha et al., 1999) although Miner et al. (2001) argue that these are not the same construct. They posit that improvisation increases the chances that bricolage will occur as there is less time to obtain resources in advance. Bricolage is a construct frequently used to describe the resource set invoked by improvisation (Baker et al., 2003), but can occur in non-improvisational contexts (Miner et al., 2001).

Sense (2008, p. 38) asserts that 'practice connects knowing with doing and is highly improvisational, it can therefore be considered a bricolage of material and mental, social and cultural resources, where people are active bricoleurs'.

In relating knowledge with task situations, Madsen et al. (2008) present a framework to illustrate the four distinctive work situations which occur based on the different levels of task uncertainty and complexity. This framework is shown below and portrays that each situation requires different competencies, resources and organisational support.

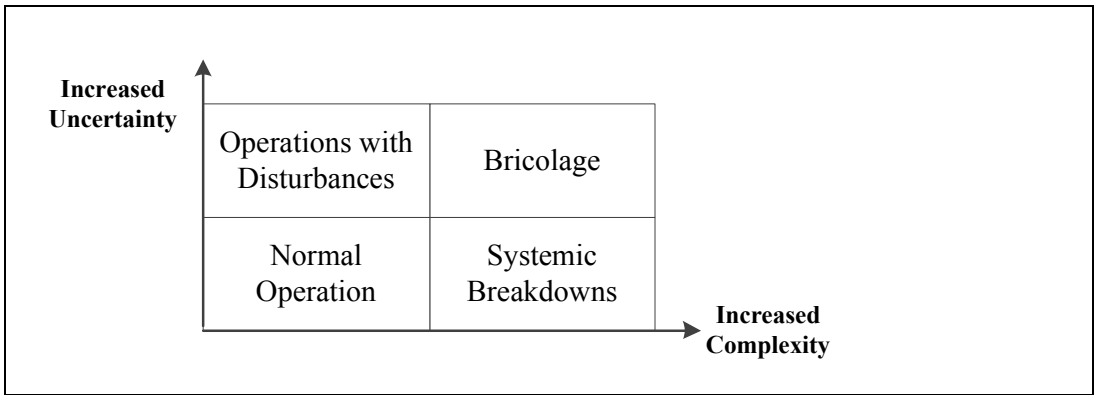

Figure 5.1: Dimensions of task situations. (Madsen et al., 2008)

In normal operation, where everything functions as planned and described, less experienced personnel refer to explicit knowledge such as standard operating procedures, quality instruction and manuals, whereas those experienced personnel had internalised the knowledge.

For situations of greater uncertainty and complexity there is a greater reliance on know-how and individual experience. Due to the combination of different technologies, skills and organisational units, this situation requires the imaginative use of available resources as individuals seek to resolve complex problems. The term bricolage is used to emphasise the social and intuitive dimensions and the need for knowledge encompassing different skills, disciplines and experiences (Madsen et al., 2008).

With regards to managing uncertainties, Grote (2004) describes two contrary and extreme approaches. The first approach would be for the organisation to minimise the occurrence of uncertainties by extensive planning and implementing tight regulation, thus reducing freedom of action. The second approach would be for the organisation to provide autonomy for staff to make their own decisions and provide plans as a resource.

Researching the healthcare profession, McDonald et al. (2005) found that doctors and nurses held diverging views on rules and guidelines in the operating theatre. Nurses saw guidelines as a key element in providing safe, good quality care. In contrast, doctors viewed guidelines as unnecessary and even potentially harmful.

Most organisations would probably adopt a mixture of the two extreme approaches described by Grote (2004) where both autonomy of actors and sufficient regulated resources would be necessary to work towards a common objective. Weick (1976) describes this concept as loosely coupled systems where any location in the organisation contains interdependent elements that vary in number, strength of their interdependency, and preserve some degree of determinacy (Orton & Weick, 1990).

With a foundation based on flexibility and problem solving capacity, bricolage draws upon existing knowledge, know-how and social capital which are combined and externalised in various arrangements so as to facilitate more innovative solutions (Andersen, 2008).

Thomas, George, et al. (2012) assert that the expert practice of proficient project managers requires more complex integration of thinking styles than current PM doctrine suggests. Taking an interpretative phenomenological approach to understand the lived experience of project managers, they posit that successful PM is often created from a bricolage of PM artefacts and experience in order to create new or develop alternative uses of existing tools beyond their original purpose.

Taking into consideration the above elements and definitions of the central theme of bricolage, the interview transcripts were reviewed with respect to the following:

- When (in what context) did instances of bricolage occur?
- What action was performed and how?
- What was the effect of the action?

We utilised the 'coding paradigm' of Corbin and Strauss (1990) to describe the nature of bricolage within the knowledge intensive environment of PM and the patterns of behaviour identified.

In order to understand the contextual conditions which may influence the central phenomenon and create the set of circumstances that affects the respondents, we first consider the environmental context from both an external and internal aspect.

5.3.1. Environmental Context – External

With regards to the external environment, the factors concerned include the regulatory, economic and competitive market environment.

As a global financial services organisation, even though the research was undertaken from Hong Kong, many of the projects discussed were influenced by global regulatory legislation. As quoted on an organisational website 'The demand and impetus to address financial crime and regulatory matters in our sector is unprecedented'. In addition to the earlier respondents' references an example of the regulatory influence are the '*Principles for effective risk data aggregation and risk reporting*' (Basel Committee on Banking Supervision, 2013), otherwise known as BCBS 239. Although presented as fourteen principles, this is a mandatory regulation.

> *Banks identified as G-SIBs [Global Systemically Important Banks] by the FSB [Financial Stability Board] in November 2011 or November 2012 must meet these Principles by January 2016; G-SIBs designated in subsequent annual updates will need to meet the Principles within three years of their designation.* (p. 11)

As guidelines, BCBS 239 only provide limited metrics and advice on how to monitor and measure the effectiveness of one's progress or implementation. Also as other banks have different systems, processes and interpretations, the requirements become ambiguous. This makes knowledge sharing amongst industry peers and colleagues challenging.

Further to this, the economic situation has a large influence, with respondents referring to the global financial crisis, the collapse of Cyprus, Latvia joining the European economy, to name only a few examples. At the time of this research there is global debate on the impact on the financial sector regarding the UK exiting the European Union (BBA, 2016) and the internationalisation of the China Renminbi (Eichengreen & Kawai., 2014; Maziad & Kang, 2012). The ramifications of these events are yet to fully materialise.

In addition to regulations being imposed on the finance industry, the competitive landscape has changed over recent years due to the migration of customers to digital channels (Bain & Company Inc., 2015) and their changes in attitudes and expectations,

which is causing increasing demands on innovative products being provided at a more rapid pace (PWC, 2014).

In this 'high velocity' environment of continuous change (Bourgeois & Eisenhardt, 1988), these external influences impose a high level of uncertainty on the organisation which are outside the control of the project team and organisation. These uncertainties and dynamic challenges of the external environment therefore make it difficult to accurately pre-plan project activities.

Since the fundamentals for traditional PM are based on a 'Initiate – Plan and define – Execute – Control and monitor – Close' cycle (Association for Project Management, 2006; Project Management Institute, 2008, 2013a), this would suggest that the prescribed PM doctrine may have limitations under such conditions.

As described by Jaafari (2001) in such environments where not all the project variables are identifiable at the outset, or additional variables may ensue during the project life, it is necessary to continuously re-evaluate the project objective and adjust accordingly. Project managers perform proactive complexity management, strategy-based decision making and integration of the project phases to incorporate the environmental variables. This entire process is experimental in the respect 'that the manager will try to see what will work' (p. 94). The process is applied intuitively based on one's interpretation of the challenges, one's knowledge, experience and reflective thinking. With the constant complexity, uncertainty and changes in technology and organisational structure there is a need for project practitioners to be adaptable and possess interpersonal skills as complementary to technical competence (Ramazani & Jergeas, 2015).

An example of this ambiguity and complexity can be illustrated with reference to the interview with respondent #7 who was working on externally driven regulatory projects.

> '…there are certain things beyond our control, for example, the clarity of the requirements, because the regulatory requirements, typically are very ambiguous.'
>
> '...we operate in so many jurisdictions, and very often different jurisdiction have different requirements – sometimes in conflict of requirements…'

> '…all these regulation changes doesn't exist in a vacuum, right. It typically has to be merged, or to be consolidated with existing requirements, existing systems that we have.'

In this case the respondent described how he would make do with the resources available and try to piece together whatever information was available in order to

> '…develop a clear business architecture, technical architecture, as the guidelines against those uncertainties, but it does add in lots of challenges to the project.'

In order to counteract such environmental turbulence, one has to use 'creativity, intuition, and the tacit knowledge built up over time and through experience' (Leybourne & Sainter, 2012, p. 6). Respondent #7 affirms this supposition as he explains:

> '…you have to learn on the flight. So it's not something that you can go to school to train for two years, and when you come out, you know everything…I secured the basic fundamental knowledge from school, or by reading some books, and then… once you have the basic knowledge, all the changes are not too far apart from what you learn. It's like slight change, here or there.'

5.3.1.1. Consequences of Bricolage – External Environmental Context

For environments where external influences impose a high level of uncertainty on the organisation, the consequences of bricolage can generally be regarded as positive for the organisation. External influences make it difficult to determine the clarity of requirements, and as changes for the project team will normally be contingent on other parties, 'we won't have time to have a holistic understanding' (#7). In these situations, respondent #7 gave an example whereby they

> '…just have to mix some more "tricks"…typically what do we do, we are a participant in the change, we will build a temporary solution to accommodate the change. Even manual solution to route the data into our system, so that we will buy our time, buy time to do the longer term fix.'

As to the impact on the respondent, #7 states

'…because the downstream functions are many…So you can imagine any changes is quite complicated, so typically we take the view is that if we can accommodate, we typically don't make a big noise. Because if everybody is going to make such a big noise, impossible for them to work.'

5.3.2. Environmental Context – Internal (Organisational Characteristics)

An organisation may be viewed as an open system of context (environment), process (organisational characteristics), and outcomes (performance) (Keats & Hitt, 1988, p. 572), where the organisational characteristics include structure, culture, power and politics (Zheng et al., 2010). Organisational culture relates to shared meanings, group artefacts, their norms (Schein, 2010) and has been defined as '…a complex set of values, beliefs, assumptions, and symbols that define the way in which a firm conducts its business' (Barney, 1986, p. 657). Organisational structure refers to the 'internal pattern of relationships, authority, and communication' (Fredrickson, 1986, p. 282) and may be viewed with regards to the dimensions of centralisation, formalisation and complexity.

5.3.2.1. Centralisation

This refers to 'the degree to which the right to make decisions and evaluate activities is concentrated' (Fredrickson, 1986, p. 282) and concerns the decision management authority. Mintzberg (1979, p. 182) states '[c]entralization is the tightest means of coordinating decision making in the organization. All decisions are made by one individual'. For the context of this research we refer to centralisation with reference to the project practitioner and its associated impact.

Some of the projects discussed by respondents in the study involved global projects. These were led by the head office in London and faced many of the 'usual' challenges of global projects involving spatial, temporal, cultural, work and organisational dispersions as highlighted by Nguyen-Duc et al. (2015) and Yang et al. (2015). These refer to the contextual factors which can influence difficulties in communications due to distance and time zone differences, misinterpretation due to cultural or language, as well as coordination issues.

With respect to written communications, Hansen (1995, p. 114) highlights the limitations of such correspondence. Following the written and oral communications of a project team to define a new product over a six-month period, it was identified that the 'points about the meeting minutes would be virtually impossible to discover from a reading of the minutes alone: they emerge only when we consider the oral interaction that surrounded their creation'.

It was, however, noticed that respondents expressed more frustration and discord with respect to work dispersion factors. Work dispersion factors concern the variation in: 1) engineering process, 2) task and expertise distribution, and 3) tool adoption and practices (Nguyen-Duc et al., 2015).

As the organisation's head office is based in London there were some issues highlighted. Respondent #4 gave their opinion

> '…that when the Group implements something from London, they don't take into account the cultural differences in the regions. So they will implement something globally, but they don't actually realise the impact of that in different places.'

Similarly, respondent #9 who was involved in a project to roll out a global platform, described some of the issues they encountered:

> '…a lot of the problems, people just thought it was easy because, to rollout the satellite sites, the global team thought it was just a replicate of what they rolled out in London, and they took it lightly. But actually, a lot of things had to be discussed, including the regulatory approval... They don't really get the understanding, there is a lot of local adaption required!'

From a local perspective, none of the local functional teams wanted to take the lead as the initiative crossed functional domains, i.e. Operations, Finance and Risk. Respondent #9 described how the communications were disjointed and since he was 'the so called business project manager, now everything will flow to me!' All the functional groups then pushed on the project lead responsibility saying 'The regulatory one, please handle that! The communication between the Finance and Risk, please handle that!'

In this case, the respondent (#9) then took active engagement with the project lead role without any additional resources, describing at the time 'we haven't really gone into detail, what needs to be prepared' to deliver the global platform and how he needed to 'analyse those gaps' between the global and local models.

In order to 'analyse those gaps', respondent #9 told of how he used existing documentation such as the IT system diagrams to gain an overview of the system processing flow and the requirements documentation to determine the necessary tasks to be discussed or deployed. Concurrently one would speak to those identified as project stakeholders, such as the system analysts, business analysts and other referred contacts, to gain more information about the proposed system.

The system was then 'broken down' to identify each of the related project 'components' and concerned parties. For each component, discussions were carried out with the concerned parties in order to gain a better understanding. During the discussions respondent #9 pieced together the details 'because talking to different people, we know… either in project tasks or different people's understanding and mismatch. So, there is something missed out.' And then one '…need[s] to tackle the problem, by problem.'

In addition to the basic RBPM framework provided by the bank, which respondent #9 described as being the 'first level' in tackling the problem, '…the second level is more experience and your personality. How I can get into the understanding?' Coming from a consulting firm '…even that's something not mentioned in company practice. In other similar types of project, it's similar. I can quickly say, ask certain questions that can flush those out.'

The successful outcome of this project was facilitated by the respondent being able to provide a solution based on insufficient contextual information. The respondent had to build a representation of the requirements based on formal and informal discussions from multiple and diverse stakeholders. From these scattered and extracted cues (Weick, 1995), together with one's own experience, the respondent had to 'make sense' and assemble the cues in order to provide a solution.

As a result the solution was deployed successfully in Singapore. With regards to the rollout for other locations, due to the successful deployment, other functional groups wanted to lead the project in order to obtain recognition:

> '…actually I know this one! It's my own area's attention, can you leave it to me! [since]…once you roll out a site, the model now become the same. So every time people just go through the same process.' (#9)

5.3.2.2. Formalisation

The degree of formalisation concerns 'the extent to which an organisation uses rules and procedures to prescribe behavior' (Fredrickson, 1986, p. 283). In this respect, the organisation has a relatively high level of formalisation in the maintenance of an organisation-wide 'Global Standards Manual' (GSM) which consists of the common standards and core principles used to conduct the business, irrespective of location or nature. The Standards are mandatory and overlay all the policies throughout the organisation and this is a fundamental component of the organisation's risk management structure. All executives need to attest they have read and understand its content, and are operating in accordance with its standards and principles on an annual basis. Any dispensation from the GSM requires approval from the Chairman or Chief Executive.

Organisational rules have been viewed as stable instruments promoting rationality and predictability (Weber, 1978) or as being dynamic, i.e. creating rules to retain value, modifying rules that encounter issues and eliminating rules that become obsolete (March et al., 2000). Rules consist of explicit or implicit norms, including the regulations and depict the behavioural expectations which guide an individual's behaviour and interaction (Desai, 2010; Mintzberg, 1979). These behavioural expectations may relate to 'social norms, tacit understanding, standard practice, and rules of thumb' (Olin & Wickenberg, 2001).

The organisation's policies set out the rules to protect against risk and facilitate the achievement of business objectives. Further to the organisational policies there are also country-specific policies and business procedure manuals. In order to indicate the magnitude of formalisation, there are over several thousand policy, procedures and

guidance notes with regards to regulatory compliance, financial crime compliance and reputational risk alone. An illustration of the case study organisational policy and procedural hierarchy is shown below.

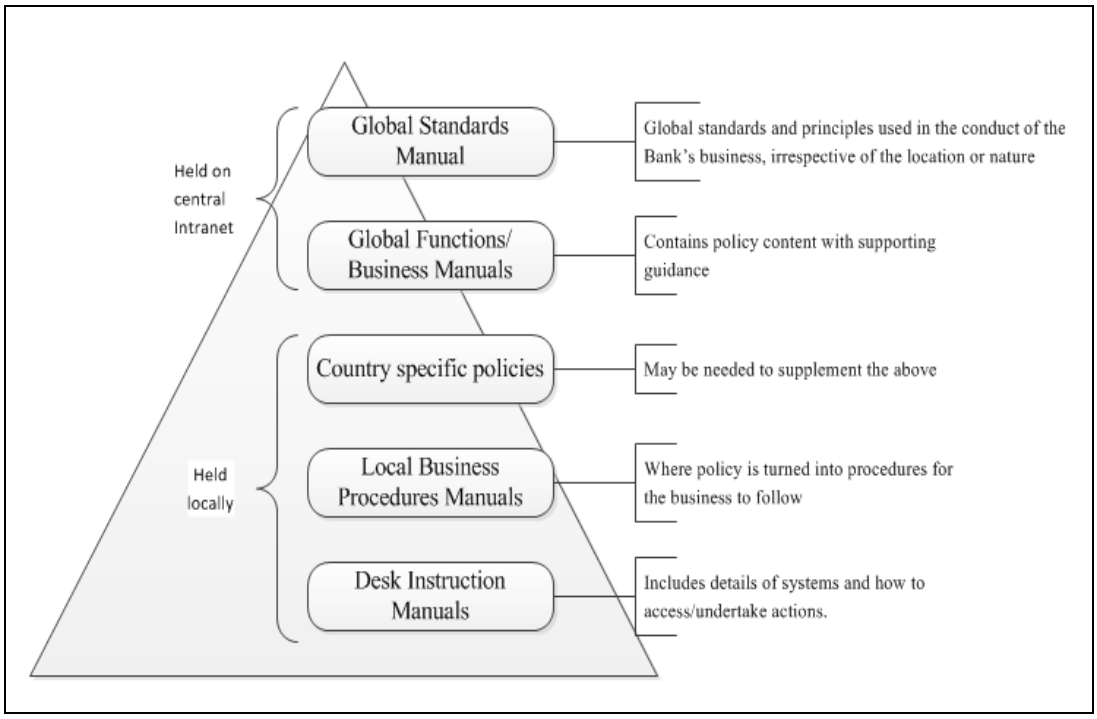

Figure 5.2: Policy and procedure hierarchy

Source: Adapted from material provided by the organisation

The organisation which served as our case study also provides a formalised channel, known as whistle-blowing (Financial Conduct Authority, 2015), by which any deviation of the rules may be reported to senior management. This arrangement is said to promote positive change within the organisation and improve society at large since it concerns 'the disclosure by organization members (former or current) of illegal, immoral, or illegitimate practices under the control of their employers, to persons or organizations that may be able to effect action' (Near & Miceli, 1985, p. 4).

From a research perspective we consider the formalisation of PM with respect to the associated policies, procedures, systems and tools being available and utilised (Project Management Institute, 2013a). There is ongoing debate as to whether adherence to

project standards does lead to better project performance (Joslin & Müller, 2015), where Thomas and Mullaly (2007) posit that many of the PM maturity models lack attention to the intangible and innovative capabilities necessary to manage projects in high uncertainty, high ambiguity knowledge-based environments.

The observation from respondent #2 supports Papke-Shields et al. (2010) whose research identified that despite PM frameworks being used in practice they are being applied inconsistently:

> 'even though the bank has tried to put in a lot of standardised tools, for project management…It depends really on where you are working…some departments I know follow it very clearly. Follow it step by step…but some don't…it depends on what kind of project. What I see is, in most of the time IT projects follow quite strict into using all these RBPM templates. But to be honest, even though I attended some of these RBPM classes, I still don't really have a clue how these RBPM documents would be able to help me run my project better…I don't really see how good it is, or how it can really help me run my projects!'

Respondent #8 also highlighted an issue with regards to the mandated PM tool:

> 'Clarity, it can be very powerful, but the overhead involved in the maintenance of it, it's also quite huge…Clarity is really boring, so I kind of ask people and attend some webinars, it's also got a lot of things there. I don't need to know all of them, so it's like, I need to know how to do this, so I go out and find out how to do this.'

Reviewing seventy PM tools with over 750 project practitioners, Besner and Hobbs (2006) determined that tools associated with organisational learning presented the highest potential for improving project performance. The relevancy of tools and techniques as emphasised in the PM standards has, however, been questioned by Thomas and Mengel (2008) as they posit that behavioural and personal competences are more relevant for organisational performance. The contribution of PM tools is context specific and a project manager's practical application to execute processes and practices is seen as a valuable tacit knowledge asset (Besner & Hobbs, 2006).

Respondent #5 also expressed surprise on joining the bank:

> ‘To be very frank, I was surprised when I joined this project. We hardly have any tools, industry tools. When, because when you come from consulting, they live on the latest, most advanced tools, but here it was quite surprising that they didn’t have any.’

Despite being disappointed with the lack of PM tools, this did not discourage the respondent. Together with the team they took a process improvement perspective and developed templates which provided a learning opportunity and the possibility to extend these templates to other projects:

> ‘It was little surprising, but in a short time we adjusted. And maybe in the new Malaysian project we’ll apply those tools. So that is a good learning for us, yeah.’

The lack of tools was not regarded as a deterrent or a major cause for frustration. Another respondent (#10) gave an example where:

> ‘What I realise at the bank, is that sometimes usage of tools is limited, due to legal or compliance bindings. In terms of project management, I have used MS Project, but mostly I found where we had a very scaleable self-structured methodologies, I’ve managed to create my own project management tools, using Excel.’

Respondent #10 also describes how:

> ‘We have created our own Wiki, we have converted all our Word documents into Wikis…We’ve created this concept of no more Word, no more Excel. The reason being, Word documents when you start emailing around, it gets mixed up, it gets lost. It’s very hard to maintain the version control…so the tools are in place in terms of knowledge retention, and I think we are getting there in terms of using it correctly.’

The above example from respondent #10 illustrates that despite being provided with access to the organisation’s PM tools and methodologies, it was felt that, based on the respondent’s knowledge of the bank and past experience, further improvement could be made using existing resources such as Microsoft Office and SharePoint. He said:

> ‘I felt that it’s better to have a hybrid model that suits the organisation, or department. So I helped tailor it based on my experience.’

The tools developed by the respondent, included templates, mentoring processes and online Wikis which promoted communications, learning and standardisation across projects.

Having consistent work practices in project environments is inhibited by the transition of team members on and off the team. Although such consistency has been said to be able to compensate for factors which may be detrimental to team performance, Chudoba et al. (2005) emphasise that excessive standardisation could obstruct creativity, innovation and agility which are essential factors for organisational competitiveness.

5.3.2.3. Complexity

Complexity has been simply referred to as 'the condition of being composed of many, usually interrelated, parts' (Fredrickson, 1986, p. 283). As covered in section 2.2.4 project complexity includes many aspects, for example, system scope and technology, organisational coverage and structure, risk and uncertainty. There is also a need to understand the nature of the interdependencies such as the reciprocal ties and the perception of how complexity changes over time (Brown & Eisenhardt, 1997; Chapman, 2016; Kang, 2007).

With regards to organisational structure, some of the respondents described their interactions with stakeholders and the need to use network and social bricolage to gain clarity of requirements or issue.

Respondent #5 spoke about the need to make many contacts:

> 'because of the complexity, the involvement of many systems and so we had to get in touch with many teams.'

and had a relatively positive outlook on the experience:

> 'I think knowledge is not a problem within <The Bank>. It's just that if you had documentation, probably that would have been easier, finding the right person may be a challenge…we have to do a snowballing.'

Respondent #17 also told how speaking to the actual operational colleague(s) doing the task did not necessary help in identifying or resolving an issue:

> 'In terms of someone who just does a task, someone that enters a journal into a system, for example. They don't necessarily understand that system of why they're doing something…'

What they would have to do is utilise their contacts or resources in order to locate someone who could assist to

> '…understand what kind of impact we're going to have on you from day one when we put the system in…' and also be able to get '…a sort of 10,000 feet view, and then from that I was able to understand.'

The voice of respondent #7 also supported other colleagues' examples on the need for network bricolage:

> 'If we are somehow able to, kind of understand this holistically, then we'll be in a much better position for meeting requirements, to forming solutions, but having said that, we are so big. Right. It's difficult.'

Whereby they would make do by seeking just enough knowledge in order to proceed with the prioritised items:

> 'We will only dive in where we identify where there will be direct impact to us. Then we will dive in that particular areas. We won't have time, to have a holistic understanding.'

For environments of high task complexity, the implementation of organic coordination strategies which are characterised by informal, cooperative and decentralised techniques has been acknowledged to enhance effectiveness (Mirani, 2007).

5.3.2.4. Power

With respect to project authority and leadership, two issues are well documented. The first concerns team building for any team or project lead, and the second concerns the lack of formal authority over stakeholders that need to provide essential information or services (Dunne Jr et al., 1978; Gillard, 2009; Melcher & Kayser, 1970; Thamhain & Gemmill, 1974).

This 'authority gap' (Hodgetts, 1968) was acknowledged by respondents as they described some of the challenges they had encountered in trying to achieve outcomes. They also provided examples of some of the leadership techniques utilised, such as relationship building, negotiations and informal influence.

The respondents generally described how projects were 'imposed' or assigned to them from group head office or their line manager, but without much guidance or support. In many of the projects described by the respondents there were difficulties in determining the initial requirements. For some cases there was no formal documentation such as user requirements or terms of reference. Even if supporting documentation was available, it might not have been fully applicable for the specific context due to country variation.

Respondent #6 tells of the Chief Operating Officer saying:

> 'You have to do it, but you have no extra resources to do it. So if, you can't find a way to do this, I will ask someone else to do it!'

Similarly, respondent #15 tells:

> 'My manager said <Name>, you handle this by yourself. I've assigned it to you. You're the project manager. It was like that!'

Further, respondent # 4 informs us of a case when

> 'All of the sites around the world used the management information data on an Excel template… however, the sites used to try and crack it, and change it… it was a mess! Absolute mess! The management. The head of <entity> Finance said "We need this...Your job is to find out!"'

In all three of the above cases the respondents took it as a personal challenge.

The reaction from respondent #6 was:

> 'Oooohh…I hate that! Because it seems like a failure to me, so I said Oh…<COO> I'm going to do it! <laugh>'.

Whereas respondent #15 describes her thoughts:

> 'As soon as the word "project manager" is mentioned, you know yourself. So it's all assigned to me. I'm the only one. Whatever happens I'm the one that has to deliver. Ok, ok, that's the way it was!'

Respondent #4 took a relatively relaxed response in saying:

> 'So it was my job to find a way of doing it, which we did!'

The challenge corresponding to project work is said to be connected with intrinsic motivation, and assignments which are regarded as professionally challenging have been posited to lead to beneficial effects on project performance (Thamhain & Gemmill, 1974). All three respondents were proud to report the successful completion of their projects. Respondent #4 admitted:

> 'I wouldn't say that the whole process was enshrined in project management theory <laugh>. It was a bit of JFDI… Just Flipping Do It!'

But proudly described that

> 'The whole thing from concept in my head, right, to global rollout took seven months! ... It wasn't perfect when it first went out, it wasn't perfect. But within the next 6 months we perfected it, so it was working very smoothly.'

Respondent #15 tells how her project completion

> '…was actually within the project timeline. Within! So I did receive some appreciation, and I felt I had done a good job too! <laugh>. I had learnt a lot too!'

Respondent #6 describes how

> 'I see it as a challenge! And I see the importance of doing it…I fulfilled the objectives, and the business, the most important thing is that the business thinks it's useful!'

In addition to some of the internal and external environmental aspects described above, there are also many softer environmental factors which contribute to a project's complexity (Bosch-Rekveldt et al., 2011; Geraldi & Adlbrecht, 2007; Jaafari, 2003). In order to manage and understand the 'information jigsaw' of available evidence from a variety of sources which all of the respondents described, research suggests that there is a need to combine tacit insights with the expertise of a bricoleur (Freeman, 2007; Smith & Culkin, 2001).

5.3.2.5. Consequences of Bricolage – Internal Environmental Context

The use of bricolage in the context of the organisational characteristics is generally positive for the respondent, as bricoleur, and the organisation. From the respondents' perspective the resolution of an organisational problem by the use of bricolage has provided personal benefits in terms of achievement, learning and recognition.

5.3.3. Nature of the Task

The nature of the task may be viewed from different perspectives (Svejvig & Andersen, 2015; Winter, Andersen, et al., 2006). This may be considered from the project manager's side who focuses on delivering on time, within budget and with specified quality, or from the perspective of the organisation which is more concerned with value creation (Andersen, 2016). The PMI takes a task perspective and states 'a project is a temporary endeavor undertaken to create a unique product, service, or result' (Project Management Institute, 2013a, p. 2) whereas the perspective from the APM (Association for Project Management) is more organisational where they define: 'Projects are unique, transient endeavours undertaken to achieve a desired outcome' (Association for Project Management, 2006, p. 2).

Tasks typically consist of several elements including an action (behaviour), the object of the action and the result of the action (Dierdorff & Morgeson, 2007). They may be categorised under three generic characteristics: task interdependence, task complexity, and task non-routineness (Wang et al., 2014), illustrated as follows.

Task non-routineness combines the elements of variety and difficulty and describes the extent to which a task is repetitive, analysable and predictable (Goodhue, 1995; Wang et al., 2014).

Respondent #12 described how disillusioned she had become in dealing with the unpredictability of the tasks:

> '…we don't really have a clear idea of where we are. But we know there are a lot of tasks! It's more like firefighting all the time, and it's more passive in terms of driving the timelines. Because things happen and we look after it, things happen and we look after it. And if there's any request we try to get it sorted. But we don't have an idea what's going to happen next, and how we're going to drive it!'

The respondent had to 'make do' due to lack of support from her senior who did not take a structured approach to managing project tasks. This did cause her undue stress which was relieved by dialogue with other team members.

Task interdependence is the extent to which one must work with other organisational units in order to integrate data from a variety of sources to accomplish a task (Goodhue, 1995).

Respondent #7 described how they took a 'divide-conquer approach…because I don't have the total picture'. For a central counterparty clearance project:

> 'there are changes needed to be done in the front office…once they're finished, they're done. But downstream a part of the very same regulatory initiative …we also have to make some changes, and our change is contingent on their change!'

The respondent made use of existing networks in coming up with a practical solution since

> 'all teams make a conscious effort about broadcasting what we need to do, what this change means…and… actually talk about these initiatives.'

Task complexity concerns the extent of interrelated and conflicting elements and the level of cognitive demand on the individual (Campbell, 1988). Respondent #5 illustrated the complexity of the task encountered. This involved '165 systems as of now which we are trying to…bring all those onto one system'. Fortunately, the respondent was able to obtain product-specific knowledge from 'system experts who have been there for 30 years' or 'done similar projects in other financial institutes'.

Referring back to section 2.2.4 and the pattern of project complexity (Geraldi & Adlbrecht, 2007), situations of high uncertainty may also arise due to the lack of factual information when creating a new solution or solving a new problem (complexity of faith). Respondents spoke of being involved in innovative, 'first time' projects using new technologies and concepts, and having to solve problems which were incorporated in the nature of the task. Under such circumstances Geraldi and Adlbrecht (2007) assert the need for trying different approaches and learning by doing. Also since the range of approaches to execute the project are relatively open, i.e. 'it is impossible to consider all characteristics of complexity' (p. 33), there is the requirement to 'trust prognosis and intuition to decide what is to be done (p. 34)' and the dependency on previous know-how.

In contrast, respondents also spoke about the issue of having too much information due to the number and interdependencies (complexity of fact) of the systems involved in a project. In such circumstances one needs to maintain a holistic view of the situation and not get too immersed in details. Geraldi and Adlbrecht (2007) recommend the support of 'computer-aided instruments…where mistakes are almost inevitable, but they are very expensive, and, hence, should be avoided' (p. 35). Respondents, however, were not privileged with such instruments and had to resort to their own resources. These resources normally came in the form of customising available software or reverting to colleagues and other social connections in order to obtain 'expert' opinions and knowledge.

The final pattern of complexity component refers to interaction. This involves interfacing with other locations or stakeholders, and concerns issues such as politics,

multiculturalism and the means of communication. This component was highlighted as the most dominant type of complexity perceived by project managers and is characterised by its tacitness. This relates to 'personal references such as different culture, disciplines', transparency indicators such as 'ambiguity, hidden knowledge or information' and empathy, which 'refers to a rather personal and intangible matter that makes a certain set of people work better together' (Geraldi & Adlbrecht, 2007, p. 41). As project practitioners, all respondents discussed their interaction with stakeholders not only locally but across various locations. This emphasises the need to understand the tacitness of their circumstances and how these were handled.

5.3.3.1. Consequences of Bricolage on the Nature of the Task

With respect to cross-project knowledge transfer, project similarity refers to the extent of task similarity and common project knowledge between projects and takes into consideration aspects such as workflows and implementation methods (Zhao et al., 2015).

Newell et al. (2006) assert that the transfer of project knowledge primarily relied on social, rather than technology related networks. One of the main reasons was that technical systems were appropriate for product knowledge (i.e. what was done), but not so efficient in understanding process (i.e. how and why it was done) knowledge.

With respect to the above examples, all the respondents performed bricolage, and made use of existing contacts in order to obtain information, or were involved in dialogue which assisted them in their projects.

5.3.4. Inherent in the Role

A work role may be described in terms of the 'combination of tasks, activities, perceived expectations and preferences' (Dubé, 2014, p. 18). Role expectations and role behaviour are themselves influenced by many factors such as work attitudes, leadership, job autonomy, personality, task engagement and ability (Dierdorff & Morgeson, 2007, p. 1228). This can be defined as 'an intermediary translation device between oneself and others of how one should act in a particular situation' (Allard-Poesi, 2013, p. 338).

Through the interviews and coding process it was highlighted that most of the respondents did not have an option to choose which project they would like to participate in. This is aligned with the PMI's PMBOK (4th edition) (Project Management Institute, 2008) where they state 'The project manager is the person assigned by the performing organization to achieve the project objectives' (p. 13). The latest edition of PMBOK (5th edition) states 'The project manager is the person assigned by the performing organization to lead the team that is responsible to achieve the project objectives' (p. 16). However, for the organisation, there is the likelihood that several project managers may be allocated within a single project:

> '<System> is the main system and they need to use the surrounding channel systems, like Internet Banking system, ATM channels, ATM banking systems, and also card systems, something like the supporting systems…there is a senior project manager there and also an IT project manager, and for the surrounding systems, they also have their individual IT project managers.' (#20)

The project manager may be regarded as some form of 'hero' by some (Blackburn, 2002), where Pettersen (1991) provides an integrated requirements profile to include twenty-one predictors covering a wide dimension of problem-solving skills, management skills, strategy and organisational know-how as well as specialised knowledge.

A project's success or failure is directly related to the leadership of the project's stakeholders (Cleland, 1995) and as the project manager's role concerns the management of such professionals (Gaddis, 1959) they are 'placed at the centre of their project' (Blackburn, 2002, p. 203).

In addition to senior management instructions, respondent #11 highlighted the overall pressure from stakeholders:

> '…there was some projects, where the stakeholders are not that easy…sometimes they change, they change things along the way.'

In such a case the respondent still acknowledged that

> ‘You got to come up with solutions, ideas, on being road blocked to the business…because it makes sense to the whole business itself’,

This may mean

> ‘…you come up with some kind of compromise and then make sure the project is completed and then we’ll start off with another thing and incorporate them, so these are things where ends up doing hard and fast way, you know, that is it and nothing more!’

There were also examples whereby the project respondent was ‘welcomed’ to take on the project. Respondent #4 told how

> ‘Everyone recognised it was a mess. I didn’t have to sell it much at all! They wanted a solution. Everyone said this is ridiculous we can’t get access to our data. … So it was my job to find a way of doing it, which we did.’

The issue of ownership, or rather lack of ownership, was illustrated by respondent #9 who was involved in derivatives operations. As the project would impact across functions, for example, Back Office Operations, Finance, Risk and others, no department wanted to take the lead:

> ‘For Finance and Risk, they are a bit disjointed…Because I’m the so called business project manager, now everything will flow to me! <laugh> And the Ops guy can say I only focus on my Ops side. The regulatory one, please handle that! The communication between the Finance and Risk, please handle that!’

There were examples where the project respondent appreciated the opportunity to take on the project, because

> ‘I think it’s a way for myself, personal achievement. I think it’s good, because I really can demonstrate, I can help coordinate…perform your recommendations, instead of just follow the global side.’

As the first site to have the system deployed, no one wanted to take the lead, but once this project was successfully completed and had to be rolled out to other sites:

> '…once you roll out a site, the model now become the same. So every time people just go through the same process… people start to think…mmh, actually I know this one! It's my own area's attention, can you leave it to me!'

Respondent #11 also provides another example whereby

> 'it's one's own initiative to come up with ideas…then present it as an item for consideration. And if the stakeholders were to buy in, then we go for it!'

When prompted about how these ideas would come about, the respondent (#11) said:

> 'Previous experience…I've done operational work as a user, as well as a supervisor, as well as managing, so these, sort of, give me the, I would say, the background of what needs to be done, how it should be enhanced, and what will the user want to see…because I understand what the users are looking for…so it's easier for me from that perspective to actually come up with solutions.'

In addition to entrepreneurial thinking and action, the use of previous experience in operations brings about the situation of institutional bricolage whereby the recombining and rearranging of procedures was required. Similarly another respondent described one of her projects which utilised institutional bricolage '…to create a Securities Operation Centre, which would centralise all the similar types of operation for each of these entities, departments into one processing centre' (#2). This centre is still operating within the bank despite being deployed around ten years ago.

Respondents spoke of the need to be self-reliant and a self-starter. They highlighted their use of current personal and professional connections as the means to draw upon unplanned resources which were readily at hand. One respondent (#8) told:

> '...It depends on who you meet, depends on the situation, if you jump into a role and the person's still there, then of course, it's up to you to approach the person, to arrange some handover, and depends on how thick your skin is, you go and ask as many questions as you like! But if you go into a role, where the person has already gone, ok, you have to rely on your own to find out who still knows something about it, and find it out that way!'

On providing an example the respondent advised that 'There's no way I can fully understand how the system operates, right?' Therefore when posed with a situation:

> 'I spoke to a friend I know. He's very good in <System>, he's very very knowledgeable in <System>. Then I said I got to make a decision, I don't know which one is better. So I said, this is the case, this is what we want to achieve, the IT gave me two options, <laugh> Right, so. Then he helped me, explaining enough details, this option has this and that, that option has this and that'

The respondent told how the friend was not related to the project: 'No, it was nothing to do with him! <Laugh>'. Confidently the respondent told that she did 'not really' have any difficulties in trying to obtain knowledge within the bank:

> 'Put it this way, if there's something I know I need to know, even if I don't know myself, so then I try my ways, different ways to obtain the knowledge. It might of course, it will take a longer to find out.'

Similarly, respondent #6 told:

> '…everything is about contacts, everything is about network. Nothing is written, especially on implementation. You can't just go to FIM (Functional Instruction Manual) and say, this is the process, this is the people you need to talk to know. It's nothing like that. It's always depends on people's knowledge, how long you've been here, which person you know, which team you know to get things done quicker. I know that… because we always end up doing things that no one wants to do <laugh>.'

Roles are also associated with identity within the organisation, whereby an individual's identity emerges from collectives, i.e. organisation, team, memberships, and may take on multiple roles or be perceived (Ashforth et al., 2008). Further to this, Berger and Luckmann (1967, p. 94) posit 'the individual is inducted into specific areas of socially objectivated knowledge'. From a project practitioner perspective this means that one not only needs to be concerned with the technical or 'routine' aspects of project knowledge, such as being able to produce a project or resources plan, but it also involves the cognitive and affective 'knowledge' aspects such as the values and attitudes deemed directly and indirectly appropriate for the role (Berger & Luckmann, 1967).

5.3.5. Knowledge Capability

Knowledge capability can be described as the ability to utilise knowledge assets to acquire, create, transfer, exploit and protect knowledge through knowledge processes (Gold et al., 2001; Lee & Choi, 2003; Tanriverdi, 2005). In order to exploit such capabilities the organisation needs to efficiently manage its knowledge operations in order to leverage the technical, structural and cultural infrastructure (Gold et al., 2001). Factors which may influence such efficiencies can be analysed from a socio-technical perspective to include organisational culture, structure, people and information technology (IT) (Lee & Choi, 2003).

Protection of knowledge is related to the security-orientated processes and 'designed to protect the knowledge within an organization from illegal or inappropriate use or theft' (Gold et al., 2001, p. 192). These protection mechanisms may include property rights or be incorporated into the infrastructure. Although protecting knowledge is an important aspect, this was not covered in the interview guideline and no specific issues were noticed by the author or raised by the interviewees.

For the purposes of this research we concentrate on the working environment from a social perspective. Some cultural aspects such as leadership style, organisation structure and values were discussed earlier in section 5.3.2, but culture also concerns the types of knowledge required and its related activities (Sandhawalia & Dalcher, 2011).

It has been suggested that organisational culture has a strong influence on knowledge-sharing behaviours within project environments (Wiewiora et al., 2014) where collectivist cultures promote a positive effect on sharing tacit knowledge (Keskin et al., 2005).

Culture also concerns the attitudes to creating and sharing knowledge and the presence of trust mechanisms (Choi & Lee, 2003; Gold et al., 2001). Koskinen et al. (2003) and Maurer (2010) assert that the greater the level of trust, the easier it becomes to gain access and support from informants willing to transfer tacit knowledge.

Respondent #7 portrayed a positive attitude regarding the organisational culture and the support for obtaining resources, stating:

> ‘I honestly don’t really have any issues so far. I’ll just make some calls, I’ll check somebody, I will find it. It’s not that I need to spend a month or two...’

And with regards to communications:

> ‘I think it’s very good. You can always setup a sharing session, which we often have. And you can always grab people, or call them up, book a meeting with them. I suppose the challenge is because of time lag.’

The high sociability (Goffee & Jones, 1996) level within the organisation was described by respondent #8 who provided an example of when she spoke to a colleague, unrelated with the project:

> ‘I said I got to make a decision, I don’t know which one is better…Then he helped me, explaining enough details, this option has this and that option has…’

Respondent #6 also supports this high level of sociability although stating a limitation:

> ‘In here, you really need to know the people. Sometimes, because I know the people I can just pick up the phone and say can you just do it for me!’

This willingness to exchange knowledge amongst colleagues, despite the need to know who to contact, indicates a positive level of trust (Joshi et al., 2007; Nahapiet & Ghoshal, 1998; Szulanski, 1996) within the organisation. Trust is also commonly associated with a positive relationships (Levin & Cross, 2004; Mayer et al., 1995) and asserted as being critical for the successful delivery of projects (Buvik & Rolfsen, 2015; Maurer, 2010).

The process capabilities of knowledge acquisition, conversion and application are described with examples below.

5.3.5.1. Knowledge Acquisition Processes

Knowledge acquisition processes relate to obtaining knowledge through learning and also the enhanced use of existing knowledge through collaboration (Choi & Lee, 2003; Gold et al., 2001).

The use of knowledge repositories for example Microsoft SharePoint, shared networked drives and intranet was described by all respondents to obtain explicit knowledge such as project details and various procedural information. Respondent #18 portrayed some limitations regarding such repositories since

> 'with different projects, it's really difficult. You cannot link up, know where to go to find, to understand, or to do self-study, so you always have to rely on experience and your ingenuity to analyse the system… it's very time consuming.'

Other limitations described by the respondent was the lack of a standardised document filing mechanism across project teams and countries. Many would use project names which 'keep changing' and '<the bank> has a lot of free wording, labeling and terms'. Similar difficulties were also described by other respondents such as 'disorganised' (#17), and 'we don't really have time to read all the requirements' (#7). Respondent #7 also highlighted the dynamic

> 'challenge with <department> in that the many changes you have to learn on the flight. So it's not something that you can go to school to train for two years, and when you come out, you know everything.'

And how one

> '…secured the basic fundamental knowledge from school, or by reading some books, and then everything else, all pick up at work. Now, I think that the good thing is that once you have the basic knowledge, all the changes are not too far apart from what you learn. It's like slight change, here or there.'

This example extends the illustration of Baker and Nelson (2005) where they highlight bricolage as labour inputs of self-taught skills that have little regard for craft or professional boundaries. The learning of key PM skills and competencies is mainly obtained through trial and error methods rather than formal training and education (Ramazani & Jergeas, 2015). The attainment of such self-taught skills was also described by other respondents.

Respondent #1 described how attending a training class was only the beginning of a learning journey to deliver their products:

> 'I had, like, the background that could easily allow me to learn this kind of framework, and I took the training…just a step to learn the framework, so there had been a lot of late nights learning, and reading and working and trying…So web is your first friend and then do your stuff and check it works, to work on projects and face some issues, and ask support sometimes, read documentation, everything.'

The respondent later supplemented that:

> 'I do like to learn this specific stuff…we didn't have such a powerful tool before …and…at the end of the day if I didn't learn it, I wouldn't be able to deliver… research and trying, trial and error...It's how we started in University. They only give you the guidelines, the roadmap, like, this is how we do this, and do that, and then you have to take your journey alone'.

Respondent #2 talks about being new to the team:

> 'I didn't have any training, for becoming a project manager. Everything was just learning on the spot of course…basically I was just learning it from the other project managers, who had been running similar projects, on how, what are the steps, what are the templates, what order, the project plan, and all those other things…at the same time, trying to improve some of these steps as well.'

Another respondent (#8) tells how she did not have any formal training, but covers all the PM processes although admits one may not be familiar with the 'official' process names or documents:

> '…I learned my project management without any frameworks. I picked it up, and then I think I'm pretty good at delivering projects on time…if I was audited, with project management. I might not have all the boxes ticked, because I might not have delivered a piece of document…but …we've done what they've asked us to do. You know, have you got this? …Ah you mean that. But we don't call it this way, but we do this. Ah! Which is the same thing!'

The examples above illustrate how the lack of formal training did not necessarily hinder respondents' effectiveness or efficiency in delivering projects. Carbone and Gholston (2004) assert that project managers have long been expected to learn on the job and without formal PM training. This could lead to unrealised benefits in comparison with 'a

more focused and comprehensive approach' (p. 16). Actually, several respondents did not express positive opinions on being trained or contrary to common acceptance felt that the standardisation of PM frameworks or methodologies would enhance the likelihood of project success (Leybourne & Sainter, 2012; Papke-Shields et al., 2010).

This also affirms the postulation that current PM training approaches meet neither the needs of project practitioners nor of the organisation (Chiocchio et al., 2015; Thomas & Mengel, 2008; Winter, Smith, et al., 2006) and there is a lack of empirical evidence that trained or certified project managers are more successful than 'accidental project managers' (Thomas & Mengel, 2008, p. 305). This 'creates a need to develop reflective and critical thinking by going beyond routine and generic technical orientations in project education' (Ramazani & Jergeas, 2015, p. 46) and incorporating 'situational-appropriate workshops' with a focus on soft skills (Chiocchio et al., 2015). As stated by Prusak (1997, p. x) '…exposure and seasoning is a far more important learning mechanism than training'.

5.3.5.2. Knowledge Conversion Processes

Knowledge conversion processes relate to presenting existing knowledge in a useful format to promote access, structure and distribution. This also involves the mechanisms to identify, integrate and transform tacit knowledge through routines and group interaction (Gold et al., 2001).

The need to perform these knowledge conversion activities in the gathering and piecing of information from a variety of sources provides an example of epistemological bricolage and is illustrated by respondent #2:

> 'there are a lot of really good manuals that you can read, and learn fundamentals about it, plus, then play around with the system, you can then ask the people around you… lots of the documents were on the intranet and also our department …have some central servers and repository where we can get those documents.'

Similarly respondent #3 provides another example of epistemological bricolage:

> '…looking at documentation, then later we obtained a demo site from Microsoft to play with… some free courses…play around… surfing the web…ask people… ask external party, Microsoft email… student interns…'

The need to draw knowledge from different sources and the need to resort to internal and informal contacts matches with the research of Lundmark and Klofsten (2014) who identified that, from an individual basis, knowledge sources within the organisation were more important than external knowledge sources. Further to this, Lundmark and Klofsten (2014, p. 78) also determined that 'time to reflect and think, time to experiment/trial and error, and intranet/internal documentation are regarded as the most important knowledge sources' for project individuals. This research corroborated this statement.
Another tactic explained by respondent #7 was that

> 'We just have to mix some more "tricks"...Typically what do we do, we are a participant in the change. We will build a temporary solution to accommodate the change. Even manual solution to route the data into our system, so that we will buy our time, buy time to do the longer term fix.'

Practitioner #17 spoke about extensive interviews in order to 'piece together' information and experiences in order to determine the best solution:

> 'I was given some names and basically interviewed lots of people, I basically gathered a lot of information that had already been drawn up, by different individuals within the bank…some individuals in London, for example, who had done very extensive papers, white papers, on the subject, and some in the States and the UK. Then pulling something together that was relevant for Hong Kong.'

The 'piecing' of information and utilising their resources drawn from experiences prior to joining the bank was described by respondent #5:

> 'I came from the business analyst background, I've seen many migrations happening…so I had that experience that helped me grasp things quickly and I could understand the problems, because I've already seen some different angles especially from business analyst angle as well as from the project management experiences.'

In addition to the team, a respondent (#11) emphasised:

> ‘If you have domain knowledge, then you will know exactly the issues that are at hand, and what needs to be done. And whether the proposals, or the changes that we want to do. Whether they will be feasible or not, ok. Then you need to have the knowledge of the system that is being used.’

Respondent #7 described how

> ‘The business sometimes come in to present a much higher view. So the goal is that it try to help everybody in the bank have a better picture what we are up to… it’s very good, because it’s very high level, it doesn’t take too much time.’

But the use of network bricolage helps to gain more detailed knowledge:

> ‘You can grasp the sense of what this is about. But when it comes to detailed knowledge, honestly, we don’t really have time to read all the requirements…If you want to know more, you can always talk to people.’

This supports the claim from Thomas and Mengel (2008) that there should be less emphasis on the traditional tools and control techniques and more emphasis on ‘[m]aking sense, generating meaning, and learning’ (p. 308).

Respondent #9 raised the topic of collaboration:

> ‘In this bank, it seems, quite collaborative. You need to have people to help you, support you, and collaborate. Each issue you need multiple people to be involved. So I think it’s kind of culture… you need to have the level of networking, you need to have people influencing skills…I think it more facilitative skill or collaboration skill people are looking for…’

The need to collaborate with other stakeholders was also mentioned by respondent #19:

> ‘We have sort of good collaboration with the business as well…walkthroughs with the business… there’s walkthroughs with the testers as well…with engineers as well, to ensure that it’s up to their UI (user interface) style standards as well’.

Collaboration also facilitated learning; this involved participating with other team members as well as vendor relations. Respondent #5 concurred with the importance of collaboration:

> 'We had to…because of the complexity, the involvement of many systems and so we had to get in touch with many teams. I think you are right, we had to double up consciously and unconsciously, so information is built up.'

Respondent #10 talked about how 'I learnt this through discussions with my peers...So I started talking to people, looking at industry standards, looking at what best suited us…'

Working with external vendors was also a valuable learning resource as illustrated by several respondents. 'With ongoing conversation with the vendor, I was learning as we were going along…I had to look after myself, or sometimes the vendor helped' (#3).

Respondent #20 discussed making do with the knowledge dependency on external vendors despite limitations:

> '…because they are the specialist on this…we need to communicate, work closely with our external vendor…But for this innovative project, I think the vendor; they are eager to work, make a contract with our bank, so that means they are quite helpful and deliver the knowledge…But honestly, are their system provided perfect? Actually no, but I think it's a continuous improvement.'

5.3.5.3. Knowledge Application Processes

Knowledge application processes relate to the actual use of the knowledge and the mechanisms to support its effective storage and retrieval. It also concerns the sharing of knowledge and expertise in order to promote competitive advantage (Gold et al., 2001).

The earlier examples illustrated many of the knowledge repositories that exist within the organisation such as shared networked drives and the intranet. There were mixed opinions on how effective the current processes were, with several respondents describing improvements they had implemented.

Respondent #10 mentioned that

> 'In terms of knowledge retention, I think the bank has the tools in place, for example, we have a very strong collaboration tool, which is SharePoint. I don't

> think it's utilised as much as it should be. People think SharePoint is just a document storing tool. It's actually very much more than that! You can have, actually which I do with my teams, we have created our own Blog…'

Another respondent (#14) described how one of their earlier departments was using a formal project methodology based on Six Sigma processes to run their projects. No major issues were highlighted but the respondent tells:

> 'It was optional for me to use it. I have used it before, but I think adding my own flavour, additional items, helped… I work on so many projects; I can see the different styles and methodologies, at different projects… So I always pinch the best of…things from theirs and create my own best of breed.'

Respondent #5 described how when they first joined the bank '…things were not streamlined'. Using a combination of knowledge obtained through their previous consultancy work and the knowledge of the organisational domain 'experts', the processes were refined to enable 'a single version in all those project management things… (and) …have single source of document'.

Such combination of knowledge was also integrated externally as described by respondent #16 in the development of a sales solution product:

> 'We actually developed this system from scratch…it was something new to me…so we have to find out a lot of information for ourselves from Internet, reading manuals and, yes, just talking to different people, and especially the consultant has given us a lot of guidance and help in this area…We learn a lot through the process. The engagement with the different teams, direct engagement with the business...we learn from them, and they learn from us as well.'

The importance of networking was also emphasised by respondents.

> 'The networking is really important, if you want to obtain knowledge. Some people will not have formal way to communicate. I think there is still room for improvement for a formal way of centralising knowledge. Make sure it's cascaded down to the next project or …It seems contained within people. You may need to connect people to ask for help, to share.' (#9)

Respondents also spoke of various aspects regarding documentation with both positive and negative experiences. There were difficulties in locating and interpreting documentation due to non-standard filing conventions and templates. Conversely some respondents believed there was sufficient documentation available, but lack of time to review it all.

Lack of documentation was highlighted by some respondents. However it has been acknowledged in the literature that knowledge transfer from past projects is a widespread issue which incurs numerous issues (Hanisch et al., 2009; Todorović et al., 2015).

Recognising that learning from projects provides potentially valuable experiences which can be applied to future projects or generate new knowledge (Bartsch et al., 2013), there are many challenges, e.g. emphasis on meeting deadlines, dissolution of the project team, which normally limit resources to reflect on previous assignments (Grabher, 2004; Hobday, 2000). Even if documentation has been retained there may be an issue whereby the format is inconsistent, or may not be suitable for the required project (Todorović et al., 2015).

5.3.6. Emotions (Inherent in the Role)

The review of bricolage as a central phenomenon has taken into account the internal and external environment scenarios which may lead to this activity. Emotions and feelings are fundamental and indispensable in the process of reasoning and decision making (Damasio, 2003) and hence we also take into consideration the role of emotions and influence on bricolage.

> *As personal experience is accumulated, varied categories of social situation are formed. The knowledge we store regarding those life experiences includes:*
> *1. The facts of the problem presented;*
> *2. The option chosen to solve it;*
> *3. The factual outcome to the solution, and, importantly,*
> *4. The outcome of the solution in terms of emotion and feeling.*
>
> (Damasio, 2003, p. 145)

As there is much discussion on emotional forms, the author takes a 'basic' approach as posited by Izard (2011) whereby 'positive and negative experiences…are arbitrary in that any emotion might motivate adaptive or maladaptive cognition and action' (p. 371).

Sensemaking is linked to emotions and past experiences. It is commonly recognised that sensemaking occurs when a flow of activity has been disrupted and brings upon a surprise (Cannon, 1999; Dougherty & Drumheller, 2006; Maitlis & Sonenshein, 2010; Weick, 1995). Canon's (1999, p. 416) study of failure experiences identified that '[p]eople's memories of negative outcomes were found to trigger strong emotions, affecting sense-making and distorting reasoning'.

> *The reality of flows becomes most apparent when that flow is interrupted. An interruption to a flow typically induces an emotional response, which then paves the way for emotion to influence sensemaking. It is precisely because ongoing flows are subject to interruption that sensemaking is infused with feeling.*
>
> (Weick, 1995, p. 45)

From a negative perspective, this concerns 'pain points', or descriptions from respondents which may include emotions such as frustration, anger or sadness.

One of the main causes of frustration came from a lack of PM understanding from a stakeholder perspective. As an example, respondent #12 talked about

> '…my previous boss. She's not a very, how do you say, not really a project management person. She wouldn't distinguish the different phases of a project so clearly; <laugh-mild> and doesn't have a timeline of how each of the different phases is going to be carried out. So we don't really have a clear idea of where we are. But we know there are a lot of tasks! Like, it's more like firefighting all the time…we don't have an idea what's going to happen next, and how we're going to drive it. So I think it also depends on the manager.'

Respondent #14 told how sometimes stakeholders enforced projects on them with impractical deadlines:

> '…some guys will come up to you, project managers, and just say 'implement this! Next week!' Without having any consideration…So those are the projects I'm not keen on. Those are the projects that generally fail; those are the projects that generally need a lot of tidy up and rework later on.'

Another issue concerned the project requirements. Respondent #12 described how

> '…when we gather the requirements from the user, the user may not be able to commit when they can confirm the requirements… And then implementation will just go to slip. And when it slips, it cuts into the UAT [user acceptance test] or testing period…or they may not be able to test everything completely before they provided the sign off…And then when things went live, user finds there are problems, and everything falls into day 2, or BAU [business as usual] issues.'

Another cause of frustration was lack of support. Some examples were provided earlier, and this could involve other departments, own team or own managers. With regards to one's own team this was mainly due to lack of resources at the time or project phase when the respondent joined the team, e.g. close to a delivery deadline.

Frustration due to other departments could be caused because they did not want to be involved, or possibly because it appeared they were trying to cover a flaw in their processes, or a lack of knowledge which may have been expected of them. There were also several examples whereby lack of support was due to the head office directive or organisational restructuring which caused a lack or loss of knowledge:

> '…from GLTi perspective, they structure themselves as regional and global. So …it's been quite difficult for us now because sometimes a complicated project we have to engage more expertise, which is from Global. And then our direction is still to give the priorities of the work to the regional GLTi. So we struggle and sometimes we also compare the costs between these two teams, and choose the best team, so it's a lot of overhead, a lot of struggling.' (#18)

> 'That funding thing took me a short amount of time…a project manager left, and I was given their project.' (#17)

Another theme of frustration was due to the availability of appropriate tools. Respondent #2 described when

> '…they were trying to stop us using MS Project to write, run this project, and they tried to force us to use Clarity…there was a lot of people crying out on how difficult it is to use Clarity, don't know how to use it even though they had learned it…is so slow, and it's not standardised.'

Concerned stakeholders also refused to use the tool which was 'mandated':

> 'Even though we give them logins, they say: What's the point? I'm a business owner, I'm a trader, I don't care! All I want to do is tell you my problem and that's it!…I don't need to use it…It's not benefitting me!'

Despite there being many examples of frustration, difficulties or challenges which have been portrayed by the respondents, many view it as part and parcel of the role.

Respondent #12 highlighted:

> 'It can be business PM or IT PM, they're really helping to fight over the problem, and help everything to restore in line…sometimes when there are problems coming up, it can be…it can be a show stopper, but if you can demonstrate the skills to turn around and put everything back on track, that would be something like, yes, that would be something that would be considered as a bonus point. But of course the problems shouldn't be caused by you? Right! <laugh>'

5.3.7. Resources

A resource may be regarded as 'anything which could be thought of as a strength or weakness of a given firm…[and]…at a given time could be defined as those (tangible and intangible) assets which are tied semi-permanently to the firm' (Wernerfelt, 1984, p. 172). It may include 'all assets, capabilities, organizational processes, firm attributes, information, knowledge, etc. controlled by a firm that enable the firm to conceive of and implement strategies that improve its efficiency and effectiveness' (Barney, 1991, p. 101).

Lévi-Strauss (1966, p. 17) describes the bricoleur as a '[j]ack of all trades or a kind of professional do-it-yourself man', that acts on his 'stock' of material and immaterial resource elements collected independently of any particular project with the central

principle that they may be useful at any point in time. Freeman (2007, p. 486) describes the bricoleur as someone who 'acquires and assembles tools and materials as he or she goes, keeping them until they might be used…open for manipulation for whatever purpose is at hand'.

As originally presented by Lévi-Strauss (1966) not much definition is provided with respect to what constitutes resources except to state '[h]is universe of instruments is closed and the rules of his game are always to make do with "whatever is at hand"… the remains of previous constructions or destructions' (p. 17). Subsequently, Baker and Nelson (2005, p. 336) define the resources at hand as those 'that are available very cheaply or for free, often because others judge them to be useless or substandard'.

With regards to the bricolage concept, the resource dimensions of materials, labour and skills are presented by Baker et al. (2003); Baker and Nelson (2005); Desa (2012). This is outlined below with some examples:

- Materials – technology, machinery, hardware and software, presumed 'single-application' with new use;
- Labour – employees, contractors, customers, suppliers, volunteers, friends and family;
- Skills – knowledge of efficient processes or new technologies, self-taught skills.

With respect to the organisation, respondents spoke of a variety of 'cheap or free' resources they had utilised in the delivery of their projects. Some examples are provided below.

Material resources include software which may be presumed to be 'single-application':

- 'I've managed to create my own project management tools, using Excel' (#10);
- 'Because we don't want to use, spend any more money on buying…we found something called PerfectForm (#6);
- 'Tools wise, we usually follow the bank's practices…and sometimes we also develop it ourselves' (#9).

Labour resources include acquiring or working with other parties in order to gain 'free' resources:

- Respondent #3 learnt about PM by 'partnering with IT' and gained resources working with the vendor in order to obtain a 'demo site' and attend 'some free courses';
- Respondent #1 obtained access to 'two [project management] tools that was mainly provided by third party, not by the bank… they own the license and they give us access';
- Respondent #6 utilised the knowledge of 'an ex-IT auditor working for me, an ex-IT person. So it's a perfect combination';
- Respondent #20 spoke of working with a vendor because 'they are eager to work, make a contract with our bank, so that means they are quite helpful and deliver the knowledge'.

Skills resources include self-taught skills:

- 'I learned my project management without any frameworks... and then I think I'm pretty good at delivering projects on time' (#8);
- 'I work on so many projects; I can see the different styles and methodologies, at different projects… So I always pinch the best of…things from theirs and create my own best of breed' (#14);
- 'Twenty years in projects…I've not gone for any formal training in projects. It's all through experience' (#11).

Many of the respondents described multiple incidents of utilising bricolage resources. For example respondent #16 described how she 'just learn on the job' and how they worked with the vendor 'although we have not implemented this system, they do have some ideas'.

This example illustrates how some of the respondent undertook bricolage activities individually, or collaboratively with other parties – internal or externally.

The author regards the above resource dimensions of materials, labour and skills as being limiting and does not attempt to fit all bricolage activities under such categorisation. Further examples follow throughout this paper and are later discussed.

5.3.8. Sensemaking

During the conversations and interviews, respondents spoke of 'the lack of communication, or clarity' (#12) and the need 'to understand the situation… one has to get their hands dirty' (#15). There were also themes concerning stakeholders where 'everyone's still learning and understanding there are issues' (#9), and the need 'to understand what people do, and what people understand, don't understand' (#21).

These themes highlight some of the attempts by respondents to combine their experiences with information from the field in order to 'make sense of an uncertain situation that initially makes no sense' (Weick, 1995, p. 9) and to understand novel, unexpected or confusing scenarios (Maitlis & Christianson, 2014). This process of social construction (Berger & Luckmann, 1967) by which people notice, attempt to interpret and explain meaningful stimuli from their environment is known as sensemaking (Maitlis, 2005; Weick, 1979).

5.3.8.1. Introduction

Sensemaking can be defined as 'the ongoing retrospective development of plausible images that rationalize what people are doing' (Weick, 2005, p. 397) and has been depicted in terms of the individual, group and organisational level (Harris, 1994; Louis, 1980; Weick, 1993, 1995). This segregation of levels has been opposed by many (Brown et al., 2015; Dervin, 2003; Drazin et al., 1999; Gioia & Chittipeddi, 1991) where Dervin (2003, p. 139) posits that there is complex interaction between the levels where there would be an 'impossibility of separating them'.

Sensemaking concerns the processes by which individuals and organisations continuously interact with their environment and seek to understand the ambiguous, equivocal or confusing issues or events which they find themselves affected by (Brown et al., 2015; Mills et al., 2010; Weick, 1995).

These sensemaking processes can generally be described as encompassing the elements of: 1) scanning – for information gathering; 2) interpreting – entailing matching

information for structure and understanding; and 3) action – based on the scanning strategy and interpretation (Daft & Weick, 1984; Thomas et al., 1993; Weber & Glynn, 2006).

In normal, everyday situations individuals are guided by scripts, i.e. 'a coherent sequence of events expected by the individual' (Abelson, 1976, p. 33) which 'provide the individual with predictions of event sequences and outcomes' (Louis, 1980, p. 240). When the script does not appear to match the situation and the reason for the outcome, the sensemaking process is activated to identify a retrospective explanation and creates insights to determine a knowledge-based course of action (Louis, 1980; Shariq, 1998).

Sensemaking provides a 'framework for explaining observed reality, and for determining saliency and appropriateness' (Choo, 2001, p. 200). Its central focus is the ongoing construction of reality and consequences through the influence of seven interrelated properties (Mills et al., 2010; Weick, 1995). These properties which act as 'sensitizing concepts' (Blumer, 1954, p. 7) as outlined by Weick (1995, p. 17) are: 1) grounded in identity construction; 2) retrospective; 3) enactive of sensible environments; 4) social; 5) ongoing; 6) focused on and by extracted cues; and 7) driven by plausibility rather than accuracy. These properties and how they relate to the research will be covered in more detail later in this chapter. Prior to that we discuss how sensemaking is regarded with respect to the practice of project professionals.

5.3.8.2. Sensemaking and Project Practice

Schon (1983) describes the environment of professional practice where 'professional knowledge is mismatched to the changing character of the situations of practices' (p. 14). 'Problems are interconnected, environments are turbulent, and the future is indeterminate' (p16) and 'practitioners are frequently embroiled in conflicts of values, goals, purposes, and interests' (p17).

From an individual's perspective, Schon (1983) posits the limitation of the 'technical rationality' perspective which portrays the process of problem solving as a selection amongst available solutions.

> *In real-world practice, problems do not present themselves to practitioners as givens. They must be constructed from the materials of problematic situations that are puzzling, troubling, and uncertain. In order to convert a problematic situation to a problem, a practitioner must do a certain kind of work. He must make sense of an uncertain situation that initially makes no sense.* (Schon, 1983, p. 40)

To illustrate, Schon (1983) provides the example of building a road which appears to be deliverable from a technical perspective, e.g. structural design, but may have issues due to concerns on the destruction of a neighbourhood community. Under such conditions where '…situations are confusing "messes" incapable of technical solution' [quotations in original], practitioners who 'involve themselves in messy but crucially important problems…describe their methods…of experience, trial and error, intuition, and muddling through' (pp. 42-43).

Sensemaking from a project practitioner's perspective relates to the social aspects such as understanding stakeholder requirements, interpreting design guidelines and finding solutions to problems. This viewpoint focuses on 'the processes of organizing projects rather than on the structure of projects or the capabilities and resources required to execute them' (Alderman & Ivory, 2011, p. 19). There is also an emphasis on the 'processes of action and interaction that enable individuals to make sense of organizational activities and how they interact to effect the emergent projects' (Thomas, 2000, p. 42).

In the emergent context of complex projects, Alderman et al. (2005) suggest that sensemaking is a necessary process which facilitates the project manager as well as other stakeholders to make sense of the multiple meanings and their associated outcomes which need to be accommodated. They posit that the sensemaking process facilitates the project manager to better understand and overcome the project challenges where the conventional rationalistic PM approach would have been inadequate (p. 384).

Sensemaking is important in projects from a cultural perspective due to the inherent differences in core assumptions. Fellows and Liu (2016) assert that it can: 1) promote common understanding; 2) build trust and commitment; and 3) facilitate the recognition

of project interdependencies. Sensemaking studies have been undertaken in a variety of project scenarios of which a few are illustrated below.

In new product development, incorporating sensemaking capabilities will provide the team with 'the right tool' to understand the uncertainties of the environment (Ashmos & Nathan, 2002) in order to structure and share customer information, tacit knowledge, insights and ideas amongst team members (Akgün et al., 2007).

With the example of the implementation of strategic change projects, Gioia and Chittipeddi (1991) present 'a process whereby the CEO makes sense of an altered vision of the organisation and engages in cycles of negotiated social construction activities to influence stakeholders…' (p. 434). They describe the process to include: information gathering; assessing potentials and possibilities based on personal interpretations from previous institutional experience; commencement of the strategic initiative; assessing the activities and undertaking modifications based on feedback; then finally, gaining wider commitment and stronger impetus for the entire change effort.

Many respondents told of being new to the project team or the organisation. This newcomer experience involves a sensemaking period of socialisation, which is the 'process by which an individual comes to appreciate the values, abilities, expected behaviors, and social knowledge essential for assuming an organizational role' (Louis, 1980, pp. 229-230) and 'how people acquire new skills, beliefs systems, patterns of action, and sometimes personal identities' (Dubé, 2014, p. 20).

In project environments of complex, large-scale and high ambiguity, collective sensemaking may be stimulated where the ability to determine the product or service outcome may be hindered by the changing requirements which occur as the project progresses or issues are encountered (Drazin et al., 1999). Sensemaking in turn may then be translated into action, which then triggers the act of bricolage. Long-term service-led projects which are driven by a client's business plan also need sense 'to be made of future possibilities by reflecting on anticipated situations in order to influence design decisions made in the present' (Alderman et al., 2005, p. 384).

Weick (2004, p. 76) remarks that actors being 'thrown' into the midst of a complex situation where one cannot avoid taking actions and where one's effects cannot be predicted '…will cope more or less adequately in a pre-interpreted world depending on how skillful they are at bricolage, making do, updating transient explanations, staying in motion in order to uncover new options, improvisation, and tolerating ambiguity'. As actors pursue solutions under environments of imperfect understanding, diagnoses and actions co-evolve based on the feedback from the changing situation, evolving information and the associated decisions (Rudolph et al., 2009).

In order to examine how project practitioners make sense of their working environment and how they try to understand moments of ambiguity or uncertainty we refer to Weick's seven interrelated properties of sensemaking. Examples were frequently observed in the interview material and illustrated in the following sections:

5.3.8.3. Grounded in Identity Construction

Earlier we discussed some of the aspects which are inherent in the role of the project practitioner. This role is primarily concerned with identity within the organisation whereas an individual's identity emerges from collectives, for example organisation, memberships, and the team (Ashforth et al., 2008). Weick (1995, p. 20) asserts 'identities are constituted out of the process of interaction' in that who we think we are, i.e. identity, within an organisation determines what we enact and how we interpret. This affects the image one portrays to those around us, their response which affirms or denies one's identity (Weick et al., 2005) and the need for self-enhancement, self-efficacy, and self-consistency (Craig-Lees, 2001). When one or more of these human needs comes under threat the sensemaking process may be triggered in order for one to restore their identity (Maitlis & Christianson, 2014) as illustrated below.

Respondent #1 spoke about working on a flagship website that 'you can show it to your friends or like credited, it's something you can be proud of!' He also spoke of the personal motivation to learn not only because he liked to learn: 'I do like to learn new stuff. I do like to learn this specific stuff!', but also because 'at the end of the day if I didn't learn it, I wouldn't be able to deliver!' There was also the personal need to be

acknowledged for one's capability and to be trusted: 'You have to be at the level where you can deliver so you can gain more trust to enhance your reputation.'

The threat on internal identity asymmetry – the belief that one's identity is mistaken, or seen to be incongruent with who they really are (Meister et al., 2014, p. 488) – was also used as a tactic by a senior executive who bellowed 'You have to do it, but you have no extra resources to do it. So if you can't find a way to do this, I will ask someone else to do it!' As a result, respondent #6 retorted 'Oooohh…I hate that! Because it seems like a failure to me, so I said…I'm going to do it!'

Identity threat may also come when an identity is newly acquired. This may take the form of entering a new organisation, taking on a new role or being assigned to a new project (Petriglieri, 2011).

Respondent #16 described joining a new team:

> 'I remember my manager gave me a piece of work, and a lot of terms, asked me to find out some information…My manager was telling me like, I want to see how, how much you know about this subject…So we have to find out a lot of information for ourselves from Internet, reading manuals and, yes, just talking to different people…'

One of the respondents (#2) with over 10 years' PM experience with the bank described the move between projects and the need to utilise existing resources:

> '… every time I go to a new business, I'm new to the business, but I guess it's also because of the nature of my work… I need to learn about different processes in a very short time, so I know how to navigate and find ways to get things that I need to know. So I guess with all my years in the bank as well it helps me a lot because I do have a very large network of people that I know in the bank. So I can actually ask them.'

Although we have focused on the individual identity of project practitioners, threat to identity can also exist at the organisational and industry level (Maitlis & Christianson, 2014). Brown and Starkey (2000, p. 113) posit '[c]ollective identity is crucial in making sense of one's environment, particularly in contexts of rapid and unpredictable change'

and lack of such will hinder one to accurately assess the outcome of one's actions for the organisation.

5.3.8.4. Retrospective

Sensemaking is a comparative process in that referring to similar or familiar past experiences allows one to interpret current events (Mills et al., 2010). Weick (1995, p. 26) posits that 'Whatever is occurring at the moment will influence what is discovered when people glance backward'. The theme of a reflective practitioner is illustrated by Lévi-Strauss (1966) and his description of a bricoleur who has the ability to make do with whatever is at hand:

> *Consider him at work and excited by his project. His first practical step is retrospective. He has to turn back to an already existent set made up of tools and materials, to consider or reconsider what it contains and, finally and above all, to engage in a sort of dialogue with it and, before choosing between them, to index the possible answers which the whole set can offer his problem.* (p. 18).

Respondents spoke about how they used their past experiences in order to tailor their approach to resolve a challenge.

Respondent #10 told of how working with Agile PM for the last six years enabled them to bring in that knowledge since

> '…it's better to have a hybrid model that suits the organisation or department. So I helped tailor it based on my experience at the Publishing team…'

Respondent #14 also spoke about the availability of a PM methodology which was optional for her. As a result, she spoke of how '…adding my own flavor, additional items, helped…' Further she told how

> '…I work on so many projects; I can see the different styles and methodologies, at different projects…business led projects, or IT led projects…So I always pinch the best of…things from theirs and create my own best of breed.'

The reflection on personal experiences, which is a key sensemaking element (Parry, 2003), was also covered by respondent #11 stating that

> '…because I've been in Operations...as a user, as well as a supervisor, as well as managing, so these…give me the, I would say, the background of what needs to be done, how it should be enhanced, and what will the user want to see. These sort of give me, I would say, the foundation of doing what I need to do.'

Sensemaking is a 'recurring cycle comprised of a sequence of events occurring over time' where inputs comprise of past experiences, cultural assumptions, local interpretation schemes and others' interpretation (Louis, 1980, p. 241). The inclusion of prior knowledge and social context and participation is a necessity to make sense and facilitate the understanding of projects (Kjaergaard et al., 2007; McLeod et al., 2012; Shariq, 1998).

5.3.8.5. Enactive of Sensible Environments

Enactment can be defined 'as the process in which organization members create a stream of events that they pay attention to' (Orton, 2000, p. 231). This illustrates the dynamic creation of an environment where 'the people are very much a part of their own environments and in doing so create the materials that become the constraints and opportunities they face' (Weick, 1995, p. 31).

This can be illustrated by one's motivation to learn and interact with other colleagues in order to make the best of an opportunity or challenge, as opposed to just being passive. Respondent #1 passionately told of how they

> '…would like to learn this new thing, and again to deliver, so at the end of the day if I didn't learn it, I wouldn't be able to deliver…yesterday 11pm. I was cheering and happy because we have finalised things we didn't expect!'

Apart from being motivated to learn, respondent #1 was also part of a 'pioneering' team involved in learning and delivering with a new technology:

> '…resources, we have been providing it more because we have been the first guys to learn it, so we are doing the recommendations, the how tos, the kind of information flows…'

Being proactive was also described by respondent #21 in the process of delivering a project. She described how many colleagues just stayed at their desks staring into their computers with 'less people interaction and understanding'. There were scenarios where colleagues would discuss frustrations on how an 'obvious' straightforward concept could not be understood by other colleagues. What she would do was

> '…approach or talk to more business people… then as you talk to them, and you realise, you know, you can understand why they can't understand!'

This facilitated the product to be developed based on an improved and iterative understanding of business requirements and system limitations.

A final illustration of the reciprocal influence between action and environment was described by respondent #10. In an attempt to build up cross functional knowledge of the regional team, restructuring was undertaken which included extensive travelling between locations. This case of institutional bricolage produced a negative outcome in that

> 'What we realised though, through that exercise was that we were swapping them so fast, that they weren't actually working long enough in one specific stream, to build up that knowledge, so they weren't learning anything!'

These examples illustrate the primary role that the respondents take in producing the structures, constraints and opportunities in which they find themselves (Orton, 2000; Weick, 1988).

5.3.8.6. Social

Sensemaking involves the 'conversational and social practices (methods) through which…' (Gephart, 1993, p. 1469) '…organization members interpret their environment in and through interactions with others, constructing accounts that allow them to comprehend the world and act collectively' (Maitlis, 2005, p. 21).

This social construction of reality is illustrated by respondent #9 who states:

> 'In this bank, it seems, quite collaborative. You need to have people to help you, support you, and collaborate. Each issue you need multiple people to be involved… you need to have…networking…people influencing skills…'

The respondent then describes a product development workshop for the attendees to identify and determine roles, as well as gather a common understanding:

> 'This project really requires people to sit together to come up with a base concept…because everyone is quite new, so usually we need to have sessions that all people can sit together, and then go through the same type of process, or issues, all together. And then make sure that everyone is comfortable.'

Several brainstorming workshop rounds were required since 'the project manager needs to track the actions, or issues, and risks for further discussion' and also since 'we…don't really understand whether this is your problem or my problem, or whether we have a problem. Even we don't know! So we want to flush this out'.

Respondent #16 also gave an example of a new product development project where

> 'We actually developed this system from scratch. We start with nothing. So the whole team got together, got some consultants…to help us do it.'

Then the respondent described how

> 'We learn a lot through the process. The engagement with the different teams, direct engagement with the business…in the process, when we talk to them, we try to get requirements from them. So…some of them are sort of amazed. Oh…this is how it can be done, so for them, so the whole process is very satisfying, like, we learn from them, and they learn from us as well.'

The above illustrates that sensemaking does not occur in isolation since an individual's thoughts are always influenced by others and organisational socialisation which includes the norms, values and expected behaviours (Louis, 1980). As posited by Weick (1995, p. 40), 'sensemaking is never solitary because what a person does internally is contingent on others'.

Inter-subjective sensemaking through social interaction and negotiation is also seen as a major factor in facilitating successful project outcomes by the collective understanding of user requirements and improved communications (Alderman & Ivory, 2011; McLeod et al., 2012).

5.3.8.7. Ongoing

'To talk about sensemaking is to talk about reality as an ongoing accomplishment that takes form when people make retrospective sense of the situations in which they find themselves and their creations' (Weick, 1995, p. 15). For strategic change projects, Gioia and Chittipeddi (1991) describe the overall process to 'involve reciprocal processes of cognition and action, and entail cycles of understanding and influence' (p. 447).

Respondent #7 described their involvement in regulatory projects where 'there are certain things beyond our control, for example, the clarity of the requirements… typically are very ambiguous'. Since these projects 'typically are very very long-term projects', priorities normally focus on more immediate issues. This means that

> 'you don't have the key players always identified in this process, the information about the implication of the consultation is not fully understood by downstream.'

In this case there is a need to ask

> 'What does it mean to our architecture? What does it mean to our data requirements? …to different system? ...what is the meaning to the business…to the operation? You need…these details before a solution can be derived.'

Similarly, respondent #8 views her involvement in projects

> 'as no difference to if I want to renovate my own home…So I would be concerned with, what do I want my home to look like, that is, the business requirement. How much it'll cost me, when are you doing it, and who'll be doing it? ...You know, that's the kind of care and attention I pay to my projects.'

'To understand sensemaking is to be sensitive to the ways in which people chop moments out of continuous flows and extract cues from those moments' (Weick, 1995, p. 43). Several respondents spoke of difficulties such as 'don't have the total picture' (#7), 'didn't know how large was the size of the issue!' (#15), or that '…it's very hard to see the overall architecture of such a huge organisation' (#17).

In this respect, communication is a critical element of sensemaking and organising, and can be regarded 'as an ongoing process of making sense of the circumstances in which people collectively find ourselves and of the events that affect them' (Weick et al., 2005, p. 413). Participants spoke of the need

> '…to know at high level, what this means to us. So we will only dive in where we identify where there will be direct impact to us.' (#7)

And when speaking to project stakeholders to

> 'understand what kind of impact… when we put the system in, and …understanding where they sit in the organisation.' (#17)

Respondents also spoke about the delivery of projects as a cycle of delivery, learning and implementing improvements:

> 'It's as well ongoing, so it's not something you can deliver in one day and leave. It will have continuous improvement and it will have phase 2, and phase…' (#3)

The need for continuous improvement was also referred to by other respondents (#4, #16, #20) in the refinement and successful delivery of a product to the market. As knowledge and better understanding were gained through interaction with stakeholders, the development of the product evolved accordingly.

As depicted by Schon (1983, p. 50), the practitioner may occasionally encounter unexpected outcomes during routine activity. One could either ignore the situation or use 'tacit recognitions' and 'reflect on the understandings which have been implicit in his action' in order to make sense of it and determine further action.

Reflection can be defined as 'the practice of periodically stepping back to ponder the meaning to self and others in one's immediate environment about what has recently transpired' (Raelin, 2001, p. 11); and gives 'rise to on-the-spot experiment' by thinking and trying out new actions (Schon, 1987, p. 28).

This process of reflective practice can enhance individuals' sensemaking in the cross cultural project context by the 'recognition of the emergent and iterative nature of situations' (Fellows & Liu, 2016, p. 9) and enhance learning through PM (Raelin, 2001).

5.3.8.8. Focused on and by Extracted Cues

'Extracted cues are simple, familiar structures that are seeds from which people develop a larger sense of what may be occurring' (Weick, 1995, p. 50). In situations of ambiguity or uncertainty, the extraction and interpretation of environmental cues facilitates one 'to make sense of what has occurred, and through which they continue to enact the environment' Maitlis and Christianson (2014, p. 58).

The lack of sensitivity to identify critical cues and perform subsequent action may lead to undesired outcomes (Weick, 1993). Klein et al. (2010, p. 306) posit that '[m]ost failures can be traced to a breakdown in team sensemaking where critical cues were ignored and the teams failed to synthesise the existing information'. The identification of cues may come from a variety of sources which may be considered 'hard, objective data' from formal systems or 'limited, soft information' which may be obtained 'through personal contacts and causal information encounters' (Daft & Weick, 1984, p. 289).

Participant #9 told about one of their projects which was a local adaption where

> 'the global team thought it was just a replicate of what they rolled out in London and…don't really get the understanding, there is a lot of local adaption required.'

The project manager explained that there was a lot of 'disjoint' between the roles and responsibilities, as well as the communication and regulatory issues. In order to deliver the project, the respondent had to combine formal meetings and documentations with informal discussions and analysis. By these channels the respondent was able to identify

> '…some gap for regulatory approval, because talking to different people, we know. Actually, there are some other item, either in project tasks or different people's understanding and mismatch. So, there is something missed out. Then I drill into detail…to tackle the problem, by problem.'

Another respondent (#6) described the process of extracting and interpreting cues as

> '…just have to do investigation, ok, fine. If the process starts here, I'll talk to this person, and this person will lead me to someone else, so basically it's like treasure hunting tour!'

Participant #7 also provided an example where they needed to scan (collect data) and interpret (give meaning) (Daft & Weick, 1984) in order to take action:

> '...we do not require a very detailed knowledge…we will only dive in where we identify where there will be direct impact to us. Then we will dive in that particular area. We won't have time to have a holistic understanding.'

The size and complexity of the organisation also led to respondents needing the ability to extract the appropriate cues as explained by respondent #17:

> '<the bank> is quite complex so it's a case of some, some of the time, you have to step back and not to get too much into detail and lost in stuff that would waste a lot of time…understanding at a high level what is important and then getting into some aspects of the detail that impacts your world…it's being able to decipher that.'

Surprise concerns the difference between one's over-met or under-met expectations and subsequent experience (Louis, 1980). 'In making sense, or attributing meaning to surprise, individuals rely on a number of inputs. Their past experiences with similar situations and surprises help them in coping with current situations' (p. 247). Surprises may be considered as a failure to notice and attend to relevant cues, though Cunha et al. (2006) posit that cues may not necessarily be overlooked, but are a prevalent characteristic of complex environments where organisations should aim to develop resilience through dynamic adaptive capabilities and bricolage.

This resilience towards surprises was demonstrated by respondent #8:

> 'One of my success factors is I can solve the surprises very quickly because I know the answers. Or I know enough to be able to find the answers quickly…like renovating your home, there is always surprises, and you just go and fix it!'

Such an attitude to learn and be resilient to surprise is referred to by Ciborra (1996, p. 116) as being 'a valuable core capability'. Weick (1993) also supports the necessity for bricoleurs since they routinely perform in chaotic conditions and are able to maintain order with whatever materials are at hand when confronted with surprises.

5.3.8.9. Driven by Plausibility rather than Accuracy

Earlier in this chapter we referred to enactment whereby organisational members both form part of their environment and also create the constraints and opportunities which they face. The consequence of enacted environments also develops into an individual's 'plausible map' where observed actions are cognitively plotted against observed outcomes. The new experiences are influenced by expectations and old experiences become categorised (Weick, 1988).

> *Even if accuracy were important, executives seldom produce it. From the standpoint of sensemaking, that is no big problem. The strength of sensemaking as a perspective derives from the fact that it does not rely on accuracy and its model is not object perception. Instead, sensemaking is about plausibility, pragmatics, coherence, reasonableness, creation, invention, and instrumentality*. (Weick, 1995, p. 57)

Accuracy is secondary to plausibility in any analysis of sensemaking. Individuals and organisations are exposed to multiple cues, with multiple meanings, and need to be able to appropriately filter, interpret and act upon the mass of information (Bettis & Prahalad, 1995; Craig-Lees, 2001; Weick, 1995).

> *Man in his daily life is only partially – and we dare say exceptionally – interested in the clarity of his knowledge, i.e., in all insight into the relations between the elements of his world and the general principles ruling those relations*

> *…Furthermore, he does not search for the truth and does not quest for certainty. All he wants is information on likelihood and insight into the chances or risks which the situation at hand entails for the outcome of his actions.* (Schutz, 1970, p. 76)

The development of a 'plausible map' concerns knowledge as a tacit understanding that has been acquired through learning, practice and experience. This knowledge influences the quality of one's performance which relates not only to the quality of the knowledge that one possesses, but also to the certainty to which one believes they know (Hunt, 2003).

In being driven by plausibility one is looking for cues to substantiate one's sensemaking, where there is a continuous process of reinforcing and elaboration of activities in order to strengthen knowledge (Bechky & Okhuysen, 2011). This also helps to reduce the risk in the distortion or elimination of what is accurate (Mills et al., 2010) or having a 'sure-but-wrong belief' (Hunt, 2003, p. 105).

From a project perspective, this highlights the need to consistently evaluate the effectiveness benefits of projects which are intangible (Nogeste & Walker, 2005), concerns 'subjective judgement from different perspectives' (Müller & Jugdev, 2012, p. 768) and change and evolve over time (Bennington & Baccarini, 2004).

An example of the change in effectiveness benefits is the case of the London Millennium Dome. Its construction met all the criteria in terms of time, cost and scope when it opened on New Year's Eve to celebrate the new millennium and described as a major achievement. However during its first year of operation it experienced severe financial difficulties and eventually ceased operations. The financial difficulties were largely due to a shortfall in income caused by negative perceptions about the dome and lack of awareness of its content (National Audit Office, 2000). The regeneration and opening of the Dome in 2007, now known as The O_2, has since 'become a highly successful entertainment venue and a beacon for a new community on the Peninsula' (National Audit Office, 2008, p7).

Respondents described how they used a 'divide-conquer' approach to their projects in order to obtain a 'high level…picture' (#7) or took a 'levelled' approach by obtaining a 'first level…understanding…' and then to '…drill into detail...to tackle the problem, by problem' (#9).

Respondent #11 also spoke about not getting too involved in details and accuracy by 'sensing' the limitations of the team in terms of knowledge resources and how this would affect the project delivery. There was the capacity in '…outsourcing particular parts or components of this project to a specialist' rather than getting the team to 'focus' on something 'which is not their strength'. The respondent did emphasise that

> '…they could have done it, if they wanted. Yeah. But it would have been a strain on them, so rather than putting the strain on them, what we did was, we identified some people … to come in, just to do that part.'

Plausibility may also lead to inconsistency within the organisation since different meanings may be regarded as plausible by different stakeholders with respect to a common event, action or policy (Mills et al., 2010).

One scenario encountered by respondent #9 concerned a transformation project. As a global initiative directed by the European headquarters, there were many operational and regulatory issues in Asia and a lack of common understanding on product deployment:

> 'We haven't really gone into detail, what needs to be prepared, discuss with Compliance, discuss with Legal, and then we discuss with regulator. So we need to prepare a lot of material, assessment ourselves, and in particular some enhancements required back to the system as well.' (#9)

In addition to unexpected events, there has been a suggestion that sensemaking may be triggered by either positive or negative emotions whereby plausibility is substantiated by reducing equivocality or facilitating practical action to move things forward (Maitlis et al., 2013; Weick, 1995). The provision of plausible alternatives may come from contrived mental dialogues between oneself and other stakeholders. This dialogue is guided by an individual's schema which serves to evaluate past and present experiences, as well as facilitate expectations for the future (Harris, 1994).

Respondent #7 spoke about the lack of the full picture due to the complexity of the project and lack of stakeholder support. This did not, however, stop him from delivering projects since they were able to 'grasp a sense' of the requirements in order to work on a solution. The respondent also described how one made do with the information in hand due to lack of resources 'if you want to know more, you can always talk to people…The usual will be we don't have enough time!'

Respondent #14 also described having to make do with only limited knowledge where

> 'you have to bridge the gap…to try to understand what they are trying to do with very limited information and then trying best use of your knowledge that you know about what the system can offer on a functionality wise and then provide some options, or solutions to them.'

The above situation of identifying plausible solutions is depicted by March and Simon (1958) and their concept of bounded rationality. Here in knowledge intensive environments characterised by overload, ambiguity and politics, members aim for satisfactory outcomes rather than seek to achieve an optimal solution (Haas, 2006).

5.3.8.10. Summary and Discussion of Sensemaking

In summary, all seven of Weick's properties of sensemaking were identified during the study. The importance of sensemaking is clearly apparent for project practitioners to develop understanding and practices in knowledge intensive environments.

Earlier it was stated that sensemaking commonly occurs when a flow of activity has been disrupted and brings upon a surprise (Cannon, 1999; Dougherty & Drumheller, 2006; Maitlis & Sonenshein, 2010; Weick, 1995). It should, however, be noted that such surprises or unexpected events do not necessarily trigger sensemaking. The trigger is subjective upon various factors such as one's experience, perceived impact and emotions in relation to individual, social or organisational identity, as well as personal or strategic objectives (Dougherty & Drumheller, 2006; Maitlis & Christianson, 2014; Maitlis et al., 2013).

Two prominent themes that were highlighted in reviewing the sensemaking process were learning and communications. The need to learn appeared in the forms of:

Learning from 'error' – the practice of moving members between teams across locations was 'adjusted' since 'we were swapping them so fast…they weren't learning anything!' (#10). In another scenario, two support teams supporting the 'same' product were originally segregated according to global versus regional implementations. As conflict and knowledge disparity had arisen between the two teams an initiative was introduced

> 'to break down the 'wall'…to combine regional and global into one…as a true globalisation of the team, so now we do not have this struggle' (#18).

Learning together with stakeholders (internal and external) – in order to provide a plausible solution to resolve a problem or produce a product. In working with external parties 'they do not know much about <The bank> so we have to tell them how we work... so then together we'll…make it work for <the bank>' (#16).

In the provision of a service, it was also about understanding '…are their system provided perfect? Actually no, but I think it's a continuous improvement' (#20). Another respondent also described how she had to get two competitors to work together on the same project. 'There was no way we could deliver without both the suppliers together…[and]… definitely needed both suppliers to cooperate together' (#15).

From an internal aspect respondents spoke of '…getting everyone together in one room and to talk about what they want to see, or have in a product' (#19). There was also the situation with a new project whereby the stakeholders 'don't really understand whether this is your problem or my problem, or whether we have a problem. Even we don't know. So we want to flush this out' (#9).

Learning from disparate pieces of information – in addition to working jointly with internal and external project stakeholders, there was the continuous need to obtain information from indirect sources to piece them together to arrive at a plausible solution.

This normally came from one's personal contacts and conversations with other colleagues since 'it's just knowledge in the team…it's just in our heads' (#12). 'Because I know the people I can just pick up the phone and say "Can you just do it for me?"' (#6) Another respondent (#17) described how he used his prior knowledge, 'gathered a lot of information that had already been drawn up…different individuals within the bank…then pulling something together…on what would be the best solution for Hong Kong.'

Knowledge intensive work environments are characterised by a variety of problems and solutions (Haas, 2006). For organisations taking a command and control approach, i.e. clearly stated goals, explicit rules and highly specific roles, for project teams this can result in disappointing outcomes (Ashmos & Nathan, 2002). Sensemaking around cues to explain and anticipate events and then to synthesise existing with newly identified knowledge is critical in prioritising issues and determining the most appropriate action (Haas, 2006; Klein et al., 2010).

Communication is one of the most important skills required of a project manager in order to promote positive project outcomes (Association for Project Management, 2006; Thamhain & Gemmill, 1974). The PMI (2013a, p. 287) simply defines project communications management as including 'the processes that are required to ensure timely and appropriate planning, collection, creation, distribution, storage, retrieval, management, control, monitoring and the ultimate disposition of project information.' The PMI focuses more on the explicit communications such as the project plan, communications plan, and work performance reports.

The Association for Project Management (2006, p. 102) defines communication as '…the giving, receiving, processing and interpretation of information. Information can be conveyed verbally, non-verbally, actively, passively, formally, informally, consciously or unconsciously' and states that the primary objective is 'to gain a common understanding'. The APM focuses more on the softer aspects of communications advising that '[t]he project manager should recognise that…different audiences have different communication needs' and highlights '[i]nformation that may be critical to the well-being of the project is often informally available before it is available through formal channels.'

This theme of information availability through informal channels was also prominent in this research and discussed earlier in section 2.3. Examples from the respondents are briefly summarised below.

Respondents spoke of the availability of explicit knowledge within the organisation through the intranet, formal documentation and project repositories. However, for various reasons, respondents had to revert to informal methods to obtain knowledge and make sense of the situation:

- Lack of project-closing governance – 'It wasn't documented, formally documented… It was a bit of… Just Flipping Do It!' (#4);
- Lack of knowledge management culture – 'It's just in our heads. We don't have anything documented!' (#12);
- Lack of priority – 'We all try to focus on the current deliverables, so what happens is your focus shifts from that documentation to these things' (#5);
- Lack of requirements to deliver – 'Lots of loopholes, or lots of gaps, so then we have difficulty in formulating our requirements' (#7);
- Change in user requirements – 'or even the users, they may change their minds. 'Oh, actually, I want something else!' (#12);
- Delivery of an innovative product – 'It's a continuous improvement… All these (feedback) we sum up' (#20);
- Dynamic environment – 'There is new stuff every day and you get exposed to bigger areas every day' (#1);
- Team member transfer between projects – 'People move within the organisation from different teams, so after every two years, you will see people moving to other…' (#5).

Despite the above reasons for lack of documentation, the majority of respondents advised that this was not a major problem:

> 'The experts are typically very willing to share with their colleagues.' (#7)

> ‘You have system experts who have been there for 30 years and they understand all aspects of it. So if you have any problems… go to them as well. So it depends, I think, knowledge is not a problem within <The Bank>.’ (#5)

In order to gain knowledge, they would either undertake a resource seeking approach to locate new useful contacts, or utilise social bricolage which is the reliance on one’s existing contacts (Baker et al., 2003).

Due to the lack of clarity in requirements as illustrated above, there is also the necessity to develop a shared understanding of the project outcome. This would require the clear communication and negotiation of individual and collective perceptions and expectations (McLeod et al., 2012).

As posited by (Weick, 1995) the seven interrelated properties of sensemaking should only serve as a guide since they ‘suggest what sensemaking is, how it works, and where it can fail’ (p. 18). Many fields of research have evolved since the seminal works of Weick. Further to the earlier coverage concerning the individual (Harris, 1994; Louis, 1980) and the social constructionist approach (Gephart, 1993; Mills et al., 2010) framed in a retrospective process (Weick, 1988, 1995), there is increasing interest in forward looking or prospective sensemaking (Colville et al., 2016; Gephart et al., 2010; Sandberg & Tsoukas, 2015; Stigliani & Ravasi, 2012).

This research recognises the abundance and differing approaches of sensemaking research and therefore supports the view taken by Maitlis and Christianson (2014, p. 108) that ‘we will understand more about sensemaking and what it enables in organizations if we study the same central process, albeit in different ways, with different actors, in a variety of contexts’ and therefore referred primarily to ‘classical’ sensemaking perspective (Weick, 1988, 1995).

Chapter 5 has presented the analysis of the data and the subsequent identification of the central phenomenon. Chapter 6 which follows provides further discussion on this phenomenon, highlights the contribution to knowledge, limitations of the study, and recommends areas for future research.

CHAPTER 6. CONCLUSIONS AND DISCUSSSION

6.1. Introduction

Interviews with the respondents identified common traits of how they 'lived' out their experience as project practitioners. Each of them expressed how they had to cope with particular situations in order to deliver their projects.

With respect to the situations experienced by the respondents, these occurred around five causal themes: 1) environmental; 2) organisational; 3) nature of the task; 4) role; and 5) knowledge capability.

The organisation is subject to several external influences such as the economic and competitive environment. Technology and regulatory factors permeate across the causal themes as they influence the ways of working in terms of policies, procedures and processes.

As a multinational organisation there is inherent complexity due to geographical locations, organisational structure and the related systems which form part of the organisational characteristics. These related systems also refer to the accessibility and management of knowledge repositories and project management tools.

Further to systems related aspects, organisational characteristics are also influenced by people related influences such as management style, learning and development aspects such as training, and the relationships with stakeholders. Stakeholder relationship does not only refer to the understanding of user requirements, but also involves vendor relationship. Vendors and consultants were also a source of 'free' knowledge and resources in terms of providing tools, seminars and advice.

The nature of the task concerns the delivery of a product or solution to achieve a desired outcome. This concerns routine problem solving and being placed in new scenarios which have not been encountered before. Examples of such scenarios could be the

assignment to pioneering projects which require new functionality, processes or technology.

With respect to factors which are inherent in the work role, this includes the combination of tacit knowledge and associated skills such as facilitating idea generation. This also concerns other relational factors such as building the team or stakeholder engagement.

Knowledge capability involves socio-technical aspects, and taking advantage of the technical, structural and cultural infrastructure in order to facilitate the acquisition, creation, transfer and exploitation of knowledge through knowledge processes.

As depicted by Schon (1987), professional practice is more complex than relying on 'technical rationality' to solve problems which are characterised by unique events. There is a need for the project practitioner to make sense of multiple meanings and the tacit social aspects such as understanding user requirements.

The consensus on much of the sensemaking literature indicates a continuous cycle of information gathering which forms the basis for interpretation that engages one to take action. Occurring in a social context influenced by the rules and resources that define that context, the knowledge gained from the action outcome forms part of a feedback loop and generates the cues for further sensemaking which in turn leads to new actions (A. D. Brown et al., 2015; Daft & Weick, 1984; Gary et al., 1985; Parry, 2003; Rudolph et al., 2009; Thomas et al., 1993; Weick, 1995).

Whether or not to react to feedback is both a control and epistemological concern. Since action is a method for learning and obtaining understanding about an unfamiliar environment, resistance to action could inhibit understanding and increase errors (Weick, 1988). The making of sense and the interpretation of whether an event, or cue is triggered as a threat or opportunity is subjective upon many factors such as past experiences, perceived impact, rules, emotions and 'gut-feeling' (Dougherty & Drumheller, 2006; Louis, 1980; Maitlis & Christianson, 2014; Maitlis et al., 2013; Weick, 1995; Williams et al., 2012).

The model which evolved from the grounded theory approach portrays the project practitioner within this social context. Being exposed to multiple cues, with multiple meanings, the respondent needs to interpret and filter the mass of information in order to determine appropriate action (Bettis & Prahalad, 1995; Craig-Lees, 2001). The moment sensemaking is translated into action; this triggers the process of bricolage and a series of feedback loops. Here, the respondent takes on the role of bricoleur continuously scanning and interacting with the environment in order to construct their strategy (Denzin & Lincoln, 2000) and 'making do by applying combinations of the resources at hand to new problems and opportunities' (Baker & Nelson, 2005, p. 333).

The central phenomenon, i.e. bricolage which evolved from the research is the coping strategy which results from the project practitioners crafting their methods in response to their synthesising of diverse cues; in combination with their skills, knowledge and interpretation. This model of the project practitioner as craftsman and strategist, where the sensemaking process precedes bricolage, is illustrated below.

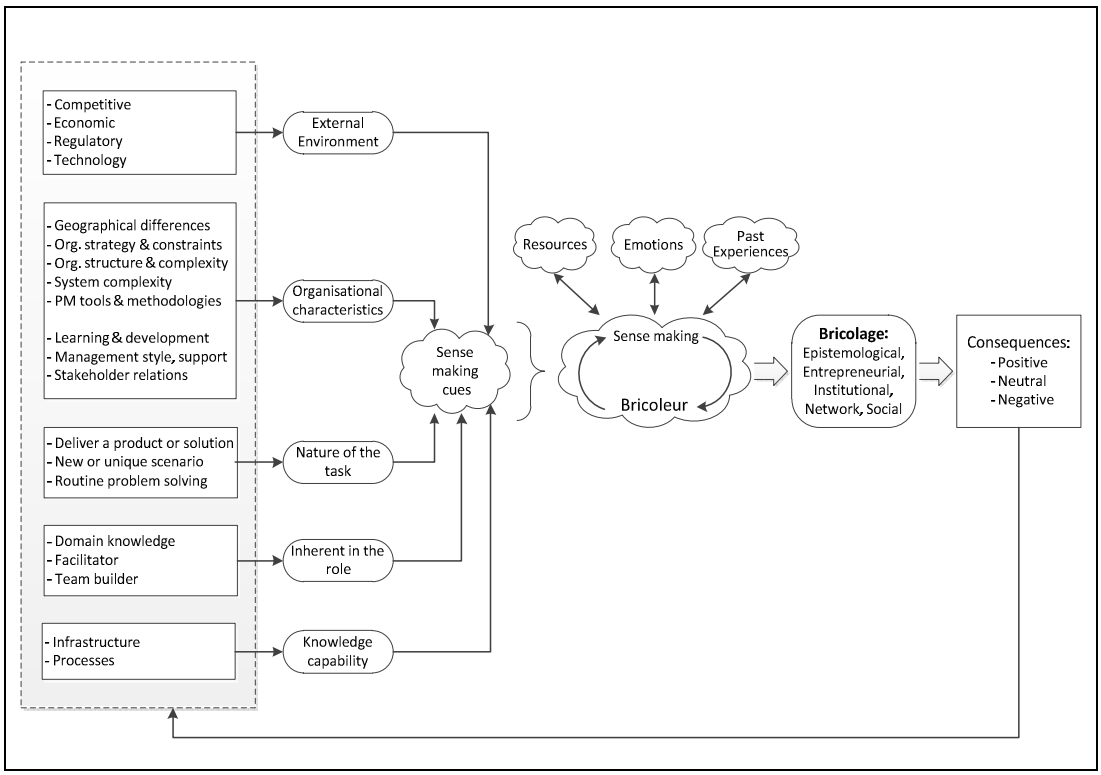

Figure 6.1: Model of the bricolage phenomenon within knowledge intensive projects

Source: Author

6.2. Discussion

The central phenomenon, bricolage, was identified to occur at both the individual and collective level. At the individual level, respondents referred to using past tacit knowledge to create improvements. Some examples were demonstrated by:

- creating a 'best of breed' PM methodology based on past experience with other methods (#14);
- creating a PM tool in the form of a Wiki since SharePoint is 'very much more than that' (#10);
- using existing free 'PerfectForm' software to create another application (#6).

'Collective bricolage' (Bechky & Okhuysen, 2011) includes the social bricolage activities of tacit knowledge sharing and epistemological bricolage to gather and piece together information. In these cases respondents spoke about working in groups, such as project teams, with vendors and other stakeholders in order to discuss, negotiate, design and create a product, where the initial product requirements were not fully understood or agreed, or to solve a problem.

Lanzara (1999, p. 347) describes bricolage as 'usually associated with second best solutions, maladaptation, imperfection, inefficiency… [where the]…outcomes of it are hybrid, imperfect, transient artifacts, which…do their job and can be improved'. It has also been highlighted that excessive application of bricolage may 'create a new set of limitations that suppress growth' (Baker & Nelson, 2005, p. 356).

Although some negative consequences have been observed, the study generally supports the facilitation of organisational bricolage practices. Respondents demonstrated conscious effort not to be restricted by limited resources and selectively undertook bricolage activities which were able to deliver a variety of process improvements and innovative products.

As project and resource environments differ considerably, the skilled application of bricolage may be referred to as 'bricolage capability' (p. 357) and its selective application

has been demonstrated to achieve strategic advantage (Baker, 2007). This supports the view that bricolage should be recognised as a feasible approach to consider in the process of innovation and product development (Garud & Karnoe, 2003).

Stinchfield et al. (2013, p. 913) suggests that bricoleurs are 'content to avoid the spotlight and operate…to get by'. This being the case, they assert that engaging in bricolage activities allows the organisation to survive under resource constraints, but 'is unlikely to lead to the development of a highly profitable firm' (p. 916). Our research counters this assertion as several of the respondents described the emotions associated with the positive outcome of their bricolage activities as 'it's something you can be proud of' (#1), 'it's a very wonderful experience' (#16), and 'quite impressive' (#20). These projects related to a flagship website (#1), a customer relationship management system for Asia and the Middle East (#16) and an innovative product development launch which allowed the organisation to take the lead in the market (#20).

Given similar events, resources and environmental conditions, individuals may attempt a unique response in order to enhance competitive advantage (Barney, 1991). The reaction to a surprise, or deviation from expectations (Louis, 1980) generally triggered a reaction from respondents, which may be realised in the form of bricolage activities such as to acquire more knowledge, determine a shared understanding, or perform emergent action, for example, interim solutions or 'firefighting' remedies. These remedies, or strategies (Wright, 2005) as described by respondents, primarily came about due to information inadequacies and were undertaken instinctively. These instinctive actions are based upon the tacit knowledge of the respondents and informal 'gut-feeling' which facilitates experienced project managers to filter and sense relevant cues (Enberg et al., 2010) as well as detect early warning signs (Williams et al., 2012).

The discussion of the sensemaking cues that may activate bricolage activities follows in relation to their causal themes; some of the activities do, however, overlap across themes.

6.2.1. External Environment

The external environment described by respondents portrayed high uncertainty and dynamic challenges brought upon by the uncontrollable pressure on the finance industry to include regulation, competition and economic factors. Such factors bring into question the accuracy of pre-planning activities and the need to best utilise existing resources. The full impact of these factors downstream is unknown and respondents told of difficulties in being unable to fully clarify requirements and present a solid business case.

Under such conditions respondents spoke about: 'every day there is new stuff' (#1) so there is need to 'learn on the flight' (#7); 'there is always surprises, and you just go and fix it' (#8); and 'perform your recommendations, instead of just follow the global side' (#9). This attitude from the respondents recognises that surprise is an inherent element in complex environments (Cunha et al., 2006). It also coincides with the views of Leybourne and Sainter (2012, p. 6) who advocate a more 'organic' approach in using 'creativity, intuition, and the tacit knowledge built up over time and through experience', rather than adhering to a traditional process and control approach. This would suggest that bricolage may be considered as an element of resilience in such environments and further investigation may produce some interesting findings.

6.2.2. Organisational Characteristics

As described earlier the organisation is highly formalised in terms of maintaining a Global Standards Manual and housing several thousand policy, procedures and guidance notes. These policies set out the rules to protect the organisation against risk and facilitate the achievement of business objectives.

Research into product development projects indicates that project managers took a relaxed attitude to breaking rules which hindered project progress (Olin & Wickenberg, 2001). Ravishankar and Gurca (2016, p. 54) also depict '[a]n important characteristic of the bricoleur is the conscious disregard for extant practices and methodologies'. Our study contradicts this view since, although our respondents may have displayed some frustration in rule obedience, i.e. using the PM methodology and tools provided, they did

generally follow the rules. This is most likely due to the highly institutionalised notion of procedural discipline found in certain industries such as banking; it can thus be said that the nature and degree of bricolage – even though it is considered by organisational actors as an essential part of their work practice – is highly contingent upon the institutional characteristics of the organisation or industry in question.

Many of the respondents spoke of their bricolage activities in terms of using other available tools, e.g. Microsoft Office, to supplement the project methodology requirements or even creating their own tools in order to streamline the process. In no instance were the expected PM requirements, such as status tracking and reporting, compromised. This illustrates that bricolage was carried out by the respondents at the operational or procedural level, rather than at the policy and rules level.

The respondents generally showed respect for the organisational policies and rules, and some respondents actually expressed negative reactions concerning the lack of rules and standardisation. They described how the lack of rules caused 'Chaos [as] things were not streamlined' (#5), 'Absolute mess!' (#4) and 'Nobody looks at … whether it affects other projects' (#2). In fact, as a follow up to each of these situations, the respondents undertook acts of bricolage and created rules in the form of process improvements and supplementary infrastructure to support knowledge sharing.

It has been asserted that bad rules may exist, even to the detriment of the organisation (March et al., 2000) as the concerned part(ies) may be protecting their own interests. This example from respondent #2 illustrates this situation.

> 'It's not about resources issue. You can put in a lot of resources, but it's not going to resolve the problem. The biggest problem that they have right now is in the people at the top is not buying into these ideas, and they are actually trying to…argue with each other about who is responsible, and this and that, and blaming each other.' (#2)

Rules are required to adapt with their changing environment (Desai, 2010; March et al., 2000), where organisational lessons learnt from experience are captured in routines that guide behaviour (Levitt & March, 1988). As mentioned, bricolage does facilitate the

dynamic adaption of rules to the environment, but one needs to take heed that if rules are changed too fast competences may be unable to develop accordingly and subsequently lead to poor performance (Desai, 2010). This situation was experienced by a respondent (#10) in their attempt at institutional bricolage as illustrated below; but was promptly remedied soon after the side effects were discovered.

> 'Initially, we were thinking of cross functional knowledge where we had people travelling here and there. What we realised though, through that exercise was that we were swapping them so fast, that they weren't actually working long enough in one specific stream, to build up that knowledge, so they weren't learning anything!' (#10)

Projects are basically assigned to respondents by local senior management or centrally from the head office. If the project was assigned centrally, some respondents spoke of the shortcomings of written correspondence (Hansen, 1999) and dispersion factors (Nguyen-Duc et al., 2015) where there may be 'two groups of people communicating in English, which is both of their second languages' (#4) and 'it's going to be hard to bond all these 200 people together in a team' (#10). In such situations where people interact in 'a highly complex, intricate, and sometimes even chaotic way…' Thamhain (2004, p. 537) asserts that '…multidisciplinary efforts… requires experiential learning, trial and error, risk taking, as well as the cross-functional coordination and integration of technical knowledge, information, and components'.

The projects which were centrally assigned tended to follow a more structured approach in terms of the need to follow the standard project documentation and procedures, although such structured processes were also utilised for some local projects. Respondents described the need to apply hard (technical) skills to plan the project and use standardised tooling to manage and report project status. They did, however, use supplementary tools such as Excel (#10, #15, #19) or PowerPoint (#9, #14, #15) or Visio (#5, #12, #16) whilst implementing the project in order to 'tick the [governance] boxes' (#6). Respondents spoke of limitations in using the prescribed tools such as 'the response is …very slow' (#21) or 'because people don't like the style, people find it clumsy' (#9) and also of frustration when 'they tried to force us to use (it)' (#2).

There is still recent debate as to whether adherence to rules such as PM standards does lead to better project performance (Bredillet, 2010; Hodgson & Paton, 2016; Morris, 2014) where Joslin and Müller (2015) posit a positive relationship between usage of project management methodology (PMM) and project success. They state that '[o]rganizations that have a more comprehensive PMM need experienced project managers to ensure they achieve high success rates' (p. 1388). Our research contradicts their conclusion and tends towards the view of Wells (2012) whereby limitations of the PMM was viewed as a hindrance to project delivery.

There is a view that there should be more reliance on tacit knowledge and experience rather than PMM (Thomas, George, et al., 2012; Wells, 2012) and that most methodologies lacked consideration for the intangible and innovative elements (Thomas & Mullaly, 2008). This view is supported by our research as our respondents tended to use their experience in order to supplement the provided methodology and even create their own tools to deliver their projects.

6.2.3. Nature of the Task

Building from Geraldi and Adlbrecht (2007) pattern of complexity, Azim et al. (2010) posit that the soft (people) aspects play a dominant role in the management of complex projects. Respondents described the need for the hard (technical) skills to plan the project, but the implementation of the plan as observed from the respondents mainly calls for social aspects such as interpersonal communication skills and stakeholder management.

Soft skills do not only contribute to the delivery of projects, but may also manifest as an early warning sign for project problems. As projects are complex social settings consisting of teams working amongst emerging behaviours and unpredictable goals, problems which arise are often subjective and interpersonal (Cicmil et al., 2006; Williams et al., 2012).

This proposition is supported by some examples of early warning signs which were handled by respondents to include: constantly changing requirements (#7); being unable to confirm requirements (#7, #19); working in silos without understanding the impact on

other parts of the organisation (#6); unable to define or agree roles and responsibilities (#2, #9); unable to negotiate a problem owner (#9); unclear project strategy (#2, #12) and lack of documentation (#5).

In order to handle the above warning signs, respondents described how their coping strategies were not based upon formal assessments or reviews, but based around soft and tacit aspects such as communication, dialogue, negotiation, building up trust and brainstorming.

6.2.4. Inherent in the Role

Berger and Luckmann (1967, p. 94) assert that in order '[t]o learn a role it is not enough to acquire the routines immediately necessary for its 'outward' performance. One must also be initiated into the various cognitive and even affective layers of the body of knowledge that is directly and indirectly appropriate to this role'.

This implies that in addition to the knowledge of PM tools and techniques, one must also understand the norms, values and even emotions associated with the role. In fact many of the respondents were not formally trained in the PM tools and techniques, and even if they were, they generally expressed limitations and doubts about their usefulness. Our research affirms the postulation from Chiocchio et al. (2015); Thomas and Mengel (2008); Winter, Smith, et al. (2006) and indicates that the lack of formal training did not hinder respondents' effectiveness or efficiency in delivering projects and that it was customary for practitioners to learn on the job (Carbone & Gholston, 2004).

The lack of empirical evidence that trained or certified project managers are more successful than 'accidental project managers' (Thomas & Mengel, 2008, p. 305) 'creates a need to develop reflective and critical thinking by going beyond routine and generic technical orientations in project education' (Ramazani & Jergeas, 2015, p. 46). Respondents illustrated with their lack of training, but successful outcomes, that '…exposure and seasoning is a far more important learning mechanism than training' Prusak (1997, p. x).

6.2.5. Knowledge Capability

With respect to knowledge capability, respondents described the necessity to locate tacit knowledge from both formal and informal social networks. The formal social network concerns the closed organisational structures imposed through defined relationships such as the PM office or the use of document repositories. Conversely, the informal social network emerges through the lack of structure from shared experiences and interests (Allen et al., 2007; Garmann Johnsen, 2011; Mueller, 2015).

Further to the use of the intranet and internal project repositories, respondents used network bricolage as they greatly relied on their informal networks to acquire knowledge and seek advice and opinions. This study supports the findings concerning knowledge intensive projects of Lundmark and Klofsten (2014) who asserted that colleagues at the individual level represent the most important knowledge source and external parties, such as partners and suppliers, are positively associated with providing creative contributions to a project.

No particular distinction was confirmed as to whether such knowledge acquisition was top-down (management) or bottom up (peers) (Mueller, 2015), but it was observed to have been obtained across disciplines as posited by Senaratne and Sexton (2009) and involve 'N-form' communications, i.e. acquired 'laterally' through interaction amongst knowledge agents (Hedlund, 1994). Azim et al. (2010) also identified communications as one of the most important soft skills occurring horizontally and vertically within and external to the organisation.

This knowledge acquisition and sharing phenomenon illustrates contradiction to the 'M-form' concept (Chandler, 1962; Williamson, 1985) of hierarchical knowledge as experienced by many of the respondents where projects were appointed by line management or head office. In such cases there was limited dialogue or particular guidance on how to approach the project, but just the management instruction to deliver the solution or service.

All respondents spoke of the importance of acquiring knowledge and utilising epistemological bricolage to resolve problems and determine solutions. Although there generally appears to be a positive attitude amongst the respondents on their ability to locate knowledge, this could be more positively influenced by the organisation as respondents expressed some difficulties in acquiring tacit knowledge, such as identifying who has the required knowledge.

Boundary spanning, which is the 'actions undertaken so as to establish linkages and to manage interactions with parties within the external environment' (Marrone, 2010, p. 914), was evidenced amongst the practitioners in the acquisition of relevant knowledge. It was also noticed that respondents tended to use their strong ties, i.e. personal connections, that 'have greater motivation to be of assistance and are typically more easily available' (Granovetter, 1983, p. 209), to obtain both explicit and tacit knowledge. Some of the interactions involved those not directly related to the project, which also gives weight to the view that 'scanning for ideas and information entails interactions with people who are not necessarily project stakeholders' (Brion et al., 2012, p. 710).

The use of weak ties was also described by respondents and mainly demonstrated in the need to locate product-specific knowledge where ties had expert knowledge or a specialised role (Granovetter, 1983), for example subject matter expert. Despite tie relationships – characterised as a combination of time, emotional intensity, intimacy and reciprocal services (Granovetter, 1973) – having been demonstrated to facilitate knowledge acquisition (Levin & Cross, 2004; Szulanski, 1996) there is still debate as to which form best promotes efficient sharing of knowledge. 'Weak and strong interunit ties have their respective strengths and weaknesses in facilitating search for and transfer of useful knowledge' as posited by Hansen (1999, p. 105).

With regards to management support, it was observed that respondents' management only occasionally provided support in relation to providing contact information, and rarely served as a knowledge source to provide project-related advice. A formal 'brokerage' (Pemsel & Wiewiora, 2013) or 'intermediary' (Bresnen et al., 2003) role (as individual, management or PM office) to facilitate cross-project learning was not available across the whole organisation and similar to Mueller (2015), respondents used their own initiative to

develop informal practices such as coffee/beer meet ups and associating themselves with other organisational groups or communities. These informal practices were used to supplement the lack of relevant information available from formal practices such as project documentation and information repositories.

In order to promote positive outcomes from projects it is vital that project practitioners learn from one project to another (Ahern et al., 2014; Kotnour, 1999; Williams, 2008). Research suggests that there is a natural inhibition to knowledge sharing (Davenport & Prusak, 1998; O'Dell & Grayson, 1998) where actor motivation is an especially important factor (Bakker et al., 2011; Mueller, 2015; Williams, 2007) within project-based environments (Boh, 2007; Lianying & Jing, 2016; Mueller, 2014).

Motivational aspects such as financial reward (Osterloh & Frey, 2000) or fear of job (ownership) loss (Szulanski, 1996) may hinder learning. However, respondents did not express these issues and were generally active in using existing contacts or seeking appropriate contacts in order to locate and re-use knowledge resources.

Respondents described how such 'knowledge seeking' activities were not perceived as a sign of weakness (Ajmal et al., 2010; Petter & Randolph, 2009; Wiewiora et al., 2013) or as an indicator of power (Ardichvili et al., 2006). They were generally willing to share knowledge, but highlighted obstructions such as the need to meet project deadlines (#7), being swiftly transferred to other projects (#1), and difficulties in identifying common knowledge, i.e. 'what to share?' (#9).

Szulanski (1996) describes impediments to knowledge transfer as including the characteristics of the knowledge itself, as well as source, recipient and context. In order to counter barriers to tacit knowledge transfer, respondents described a variety of techniques they utilised which are also reported in the literature. These included their involvement in communities of practice (Wenger & Snyder, 2000), mentoring activities (De Long & Davenport, 2003), team member movements (Galbraith, 1990), describing their techniques or best practices (O'Dell & Grayson, 1998) and communication channels (Argote & Ingram, 2000) which could be applied to other situations.

Further to the proactive engagement by respondents to facilitate knowledge transfer, turnover in terms of human resources leaving the organisation will negatively affect the availability of tacit knowledge in projects (Mueller, 2015; Parker & Skitmore, 2005; Reich et al., 2008) and subsequently affect project performance. One respondent (#9) highlighted the need to replenish network resources since 'there is really a challenge to keeping up to date the contacts… when I start to see Sametime [corporate messaging system], half the people are gone!'

For situations of information inadequacy, which may be caused by either ambiguity or complexity, Pich et al. (2002, p. 1019) argue the need for 'a combination of learning (the capacity to conduct new and original planning in the middle of the project) and selectionism (the pursuit of multiple candidate solutions until the best can be identified)'. For the organisational scenarios presented, selectionism is not an option due to constrained resources. This research therefore suggests an approach which incorporates 'adapting and learning over time' (Pich et al., 2002, p. 1020) and the need for sensemaking and bricolage. There is also the recognition that the perception of complexity is also dependent upon the practitioner's experience and the context of the project (Azim et al., 2010).

A summary of the outcomes and consequences of bricolage activities as described by the respondents is outlined below.

6.2.6. Outcomes and Consequences

When we refer to outcomes we need to take into consideration enactment, i.e. '…people are very much a part of their own environments …and in doing so create the materials that become the constraints and opportunities they face' (Weick, 1995, p. 31). This would infer, especially with respect to collective sensemaking, that outcomes are also dependent on one's role amongst parties in a negotiation.

6.2.6.1. Positive Consequences

The outcome for some of the projects described involved the delivery of a product or the resolution of a problem or issue. In a dynamic environment the proactive action to deliver new products or services is more likely to promote competitive advantage in contrast to organisations relying on existing products and services (Thomas et al., 1993).

Although the use of PM tools and methodologies was limited by some departments, respondents spoke of several instances where bricolage provided a positive outcome, such as:

- the free availability of a superior PM tool from a vendor due to a joint project;
- the provision of testing or trial software (and training) from a vendor which was free of charge;
- identifying the availability of free software from another department, which was then customised for another application;
- the use of Microsoft Office software as a supplement to the mandated PM tools. It was perceived that although this may involve some duplication of resources it was worth the effort.

The utilisation of social and personal networks generally provided positive outcomes:

- vendors proved a valuable source of resources due to the provision of software, free training, knowledge sharing, free consultancy to work on a solution;
- personal contacts (both internal and external) provided advice and dialogue on recommended solutions or assisted with various activities.

Working on interim solutions:

- provision of a temporary model for discussion to assist in clarifying requirements and gain more time to work on an optimal solution in times of crisis;
- in the form of trial and error this facilitated the building up of knowledge for the respondent and team, where joint work was carried out.

Trial and error is posited as one of the emergent characteristics of bricolage (Duymedjian & Rüling, 2010; Garud & Karnoe, 2003) and is 'mandatory for assessing the unknown or incompletely known utilities, whether relative or absolute' (Simonton, 2015, p. 11).

6.2.6.2. Negative Consequences

In situations of negative consequences, these appeared to be based around group activities.

One respondent (#4) described the bricolage activities of some regional locations of the same Finance entity. The situation was that the locations used to hack into a regional software so that they could have a local instance which could cater for their local requirements. This caused a discrepancy in the consolidated regional figures. The respondent was assigned to this project to settle this issue which was subsequently resolved.

Another situation arose when a respondent (#10) was trying to build up the team and also promote knowledge sharing. In an attempt to achieve this, colleagues were relocated around the region. It was only after a delayed period that the negative effect on the staff was noticed; as they were moved around too frequently they did not manage to exchange any knowledge. Other negative effects which may have occurred, but were not explicitly mentioned, concerned the impact on costs and other personal influences, e.g. being separated from family.

Both of the scenarios presented concern institutional bricolage, which involves the recombining or rearranging of existing organisational components such as policies and structures (Lanzara, 1998).

6.2.6.3. Neutral Consequences

Neutral consequences are basically situations where insufficient information is provided by the respondents in order to directly conclude an effect. As an example, one respondent told of their manager's lack of PM discipline and hence assigned PM tasks on an apparently impromptu basis. For the respondent this would cause frustration as she would 'make do' (Baker & Nelson, 2005) to complete the tasks on a firefighting basis, but this situation continued until a change of management occurred – the manager was later internally promoted to work in another location within the bank.

6.2.7. Summary of Discussion

The discussion illustrates how respondents relied more on relational ties and tacit knowledge gained through experience rather than on formal training, knowledge repositories and organisation-wide PM tools and methodologies, in order to deliver their projects.

In contrast to the literature which portrays bricolage as 'usually associated with second best solutions' (Lanzara, 1999, p. 347) and 'unlikely to lead to the development of a highly profitable firm' (Stinchfield et al., 2013, p. 916), respondents were able to attune their sensemaking and bricolage capability in order to provide solutions and products for strategic advantage.

Our research does not challenge the view that the technical aspects of PM, such as work definition, scheduling, resourcing and the adherence to procedures for project tracking and control, are crucial (Thamhain, 2004), but proposes more emphasis on the tacit aspects which support the project practitioner being a 'social architect who understands the interaction of organizational and behavioral variables, facilitates the work process and provides overall project leadership for developing multidisciplinary task groups into unified teams, and fostering a climate conducive to involvement, commitment and conflict resolution' (p. 534).

6.3. Contribution to Knowledge

This study recognises the increasing concern that the traditional rationalist approach to PM has limitations in environments which can be described as 'dynamically complex' (Cavaleri & Reed, 2008, p. 73). Primarily positivist, the current bodies of knowledge tend to treat projects in isolation (Morris & Geraldi, 2011) by providing 'general explanations and solutions for practice' (Smyth & Morris, 2007, p. 425) and with a focus 'to promote explicit over tacit knowledge' (Bredillet, 2008, p. 240).

With regards to this growing concern and the realisation that human behavioural issues affect project complexity (Azim et al., 2010; Morris, 2013) this research aims to contribute in two ways. Firstly, in terms of epistemology, the research takes a phenomenological approach which allows one to investigate and understand more thoroughly the contextual aspects surrounding the PM practices in a knowledge intensive environment. Secondly, this research aims to contribute to the lack of literature regarding the 'lived' experience of project practitioners (Cicmil et al., 2006; Oleary & Williams, 2013; van der Hoorn, 2015) and the role of tacit knowledge and bricolage in complex knowledge intensive projects.

The theoretical and practical implications of this research, as well as recommendations for future research follow below.

6.3.1. Theoretical Implications

The grounded theory approach illustrates the value of conducting inductive research to discover and provide insights into the experiences of the research subjects. This facilitates our aim to better understand the phenomenon of how project practitioners 'muddle through' the complex and sometimes messy scenarios encountered in their environment within a knowledge intensive financial services organisation.

As with some other authors (Hodgson & Paton, 2016), this study challenges the rationalistic approach to PM and the reliance on bodies of knowledge, training

programmes and universal methodologies. The study demonstrates the need to combine technical knowledge of a product or service with organisational domain knowledge.

The study does not dismiss the traditional rationalistic approaches to PM (Cavaleri & Reed, 2008; Chipulu et al., 2013) but illustrates the essential role of tacit knowledge in the delivery of positive project outcomes. The research identifies that in project environments where high uncertainty and uncontrollable influences exist, project practitioners take an 'organic' approach (Leybourne & Sainter, 2012) and resort to bricolage activities.

Bricolage has been used synonymously with 'muddling through' (Carstensen, 2011; Marshall & Bresnen, 2013), but they are two different concepts. As discussed in section 5.3, the term 'muddling through' is commonly associated with confusion and disorder where successful results are obtained by perseverance despite a lack of understanding, skill, plan or method.

Although the consequences of bricolage may have either positive or negative outcomes; unlike 'muddling through', there is a conscious creative act on behalf of the bricoleur to use whatever tools are at hand in order to come up with an optimal solution, process or product.

The research illustrates the emergent and dynamic characteristics of bricolage (Ravishankar & Gurca, 2016; Baker and Nelson, 2005) whereby respondents 'construct meaningful strategy' (Wright, 2005, p. 94) for coping with uncertainty and unexpected situations that were not based upon formal assessments or reviews, but based around 'innovative recombination of elements' (Campbell, 2005, p. 56).

These bricolage activities recognise the limitations of knowledge repositories for knowledge re-use (Newell, 2004) as the respondents turned to their social networks for assistance. This is in contrast to Petter and Randolph (2009) who posit that the more experienced project managers tended to rely more on formal repositories.

As the model emerged from the grounded theory approach, our findings supplement extant research into the bricolage concept in organisational environments characterised by resource constraints (Halme et al., 2012; Senyard et al., 2014) and project orientation (Salunke et al., 2011). Although research in bricolage has appeared in the PM (Klein et al., 2015) and the financial services (Leybourne, 2006) literature, it has generally been treated as an aspect of improvisation and hence the concept remains under-developed. Improvisation and bricolage have been used interchangeably (Pina e Cunha et al., 1999) but they are not the same concept. Improvisation increases the chances that bricolage will occur and can exist in non-improvisational contexts (Baker et al., 2003; Miner et al., 2001).

The model presented identifies integrative components of the bricolage phenomenon from an individual perspective (Lévi-Strauss, 1966) and the study also provides some insight into collective bricolage (Bechky & Okhuysen, 2011). Bricolage may result in either positive or negative outcomes and hence there is a necessity to understand the benefits and limitations of bricolage capabilities. As the bricolage concept was not the initial focus of the research but emerged from the study, this area of research could be further investigated in future research.

6.3.2. Practical Implications

It is recognised that knowledge – both explicit and tacit is fundamental to our understanding of PM. Being able to learn within and across projects in order to develop the capability to manage such knowledge is a major contributor to maximising value from PM and providing organisational competitive advantage (Ayas & Zeniuk, 2001; Bakker et al., 2011; Bresnen et al., 2003).

The intangible nature of bricolage makes it a difficult concept to teach. There is contradictory research where Fellows & Liu (2016, p. 1) assert that bricolage is of most importance at the early stages where ‘ambiguities are greatest’, but Leybourne (2006, p. 369) posits that bricolage is more evident towards the end of a project as ‘budgets are exhausted and the completion date is near’. This research has however identified that bricolage is of significance and may occur throughout the project cycle from

understanding stakeholder requirements, finding solutions to problems and the delivery of the product. As there is only limited research about organisational bricolage, there is also limited research-based knowledge on how best to share experiences and expand this phenomenon.

By extending the awareness, management acceptance and support for bricolage, more members of the project team can be involved to extend the network of knowledge to facilitate the navigation and connectivity of appropriate knowledge. The research supports the assertion that 'environment affects performance' (Thamhain, 2004) since it was observed that factors related to the work itself, such as personal challenge, accomplishment and recognition, were significant drivers for the respondents to consciously perform bricolage activities. In this respect, it is recommended that organisations promote an open environment which reduces communication barriers and increases the tolerance for conflict and risk taking. Support for such an ambient environment should not only rely on senior management, as line management of the project manager and team(s) also has a major role as a change agent (Halme et al., 2012).

Further, our research supports the assertion of Mueller (2015) which states 'project teams aren't informal but some of their practices are' and where deviations from the project plan are managed by informal methods due to the shortcomings of contemporary PM tools (Hällgren & Maaninen-Olsson, 2009). In such environments it is recommended that management builds up trust and autonomy so as to promote personal responsibility such that individuals become empowered to develop informal knowledge-sharing mechanisms with an aim to improve existing practices.

The conscious act in undertaking bricolage introduces an inherent "formalisation" whereby the tacit understandings and solutions of a bricoleur provide learning experiences and opportunities which may eventually lead to the production of explicit knowledge such as lessons learnt and post implementation reviews. Bricolage activites and the knowledge acquired not only benefit the individual themselves, but can also benefit the project team and facilitate organisational learning (Weick, 1991).

The research has highlighted how individual bricolage has facilitated practitioners in their ability to deliver projects, but has also brought attention to how collective bricolage, e.g. working with external vendors, was utilised in order to produce new products and venture into new markets.

The research also suggests the need for the organisation to enhance the flow and application of tacit knowledge. This could be promoted by more soft skills training, e.g. communications, team building and facilitation, as well as increasing the opportunities for colleagues to connect, interact, and share knowledge and experiences. Such opportunities could be facilitated by the use of conversation techniques such as The World Café (Brown, 2001) and Open Space (Owen, 1997) and promoting communities of practice (Wenger and Snyder, 2000).

The bricolage perspective builds on the concept that individuals and organisations under similar or same event(s), constrained resources and environmental conditions can provide unique responses and services in order to enhance competitive advantage (Barney, 1991). This research builds on the extant research which posits that the conscious use of existing resources which may have otherwise been regarded as invaluable (Baker & Nelson 2005) can be regarded as a strategic capability (Baker et al., 2003; Baker & Nelson, 2005).

Berger and Luckmann (1967) describe how one comes to believe that the meaning of their practices, routines and resource environments are fixed and institutionalised (p331), but since the meaning of a resources environment is socially constructed then the actor needs to be able to locate and recognise how resources can be made available and adapted to their requirements. In order to facilitate this, the organisation should encourage experimentation and dialogue and look towards developing its dynamic capability which can be defined as 'a learned and stable pattern of collective activity through which the organization systematically generates and modifies its operating routines in pursuit of improved effectiveness' (Zollo & Winter, 2002, p. 340).

6.4. Recommendations for Future Research

The research involved interviewing experienced project practitioners, with over five years' experience. Further research could take into consideration the application and consequences of bricolage based on those less experienced, or more experienced, such as those with less than two years' or those with more than ten years' experience.

It has been posited that the ignorance or lack of sensitivity to identify critical cues and perform subsequent action may lead to undesired outcomes (Klein et al., 2010; Weick, 1993). As surprise is an inherent feature of complex environments (Cunha et al., 2006), further to predicting surprises, which was discussed by one of the respondents in terms of business contingency management, one could investigate how such resilience to surprise can be developed.

Recent literature suggests that bricolage may also be employed as a cost and risk reducing initiative and be incorporated into strategic planning (Ravishankar & Gurca, 2016, p. 54) and a key dynamic capability (Smith & Blundel, 2014). Further research could take this into consideration as to the feasibility and outcomes for a formal bricolage strategy.

Garud and Karnoe (2003) and Ravishankar and Gurca (2016) posit that geographical proximity plays a critical role in collective bricolage. Our research suggests, as with much academic research (Koskinen et al., 2003; Nonaka & Takeuchi, 1995; Weick, 1995), that proximity is more advantageous for the building of trust, shared repertoires and the transfer of tacit knowledge through planned and spontaneous conversations. As many of the respondents spoke of projects being carried out over several locations, further research could be conducted to investigate the phenomenon of collective bricolage in a virtual team environment.

This study has identified a basket of subjective factors which can contribute to project practitioners undertaking bricolage via the process of sensemaking. One of the main factors affecting bricolage activities is past experiences which motivate the individual to take action. Since the bricolage phenomenon evolved from an initial investigation to explore the 'lived' experiences of project practitioners, future research could focus more

on the motivational factors for action. This could include various demographical differences such as age and length of project practitioner experience. One could also consider more individual aspects such as past experiences of practitioners.

As a global SIB (Systemically Important Bank) the regulations imposed by the financial authorities would be under greater control and scrutiny than banks which are not regarded as such. In this respect, further research could be undertaken in other global or domestic SIBs, or other financial institutes where there is less regulatory imposition, such as a local financial institute. Also as this research took place with consideration of knowledge intensive projects within the financial services industry, research could be extended to knowledge intensive projects in other sectors such as the consultancy, legal or medical profession.

6.5. Conclusion

The use of bricolage in the organisational context indicates an overall positive outcome for both bricoleur and the organisation. However, since bricolage is bound to tacit knowledge it is also contingent on staff turnover. Some of the coping process identified by Espinosa et al. (2006) on global bound projects, i.e. coordination, communication, task programming, team cognition, shared knowledge and beliefs, as well as trust, have also been facilitated through the act of bricolage.

The research presents the complex social environment of project practitioners characterised by messiness, ambiguity and unpredictability brought about through a highly competitive and regulated industry. Under such conditions of complexity, it would be impossible to present a single framework which provides guidelines to guarantee successful project outcomes. However, the developed framework hopes to facilitate a better understanding of the criteria and dynamics of the resource constrained environment in order to promote more positive outcomes for both the practitioner and the organisation.

The research illustrates some of the 'hidden' activities undertaken by project practitioners in their quest to deliver their projects successfully. In addition to the provision of training to support technical knowledge and the linear, rational PM process, it is posited that the

organisation should also promote a 'bricolage friendly' working culture. This can be facilitated by enhancing trust and openness, tolerance for trial and error, 'organisational navigation' and organisational learning.

6.6. Limitations

Using grounded theory building, this inductive study was undertaken in a global financial services organisation. As a single case study, the findings would not be expected to be generalisable across other service organisations, and may not even be applicable to other financial organisations.

The 'small' sample size of twenty-one interview participants is 'typical' in grounded theory studies (Creswell, 2007, p. 64); however, one would need to consider if this would be a good representation of project practitioners within the organisation.

Another limitation with regards to inductive research is the potential bias brought upon by the researcher. Being employed by the organisation which served as the case for our study, it would have been impossible for the author to approach the research with a 'blank mind'. In order to mitigate such limitations, best practice was followed in collecting and analysing data as well as in preserving a chain of evidence which could be followed or reinvestigated by external researchers.

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