PERSPECTIVES ON KNOWLEDGE RETENTION AND LOSS FROM EXPERT ATTRITION – AN ORGANISATIONAL CASE STUDY

by

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Thesis submitted in fulfilment of the requirements of the degree of
Doctor of Philosophy

2016

ABSTRACT

Knowledge loss is a crucial issue facing the ageing workforce. This dissertation aims to explore the loss of critical knowledge that can happen when experts depart the workforce. The dissertation specifically focuses on experts' perspectives on knowledge loss.

The dissertation's major theoretical contribution involves constructing an experts' perspective conceptualisation that is guided by Nonaka and Takeuchi's (1995) SECI Model. A framework is developed for managing and retaining knowledge based on the identification of critical knowledge areas that have been lost.

The dissertation provides a case study of a single manufacturing arm of an organisation in the mining industry in Australia. A case study approach using a semi-structured interview method was used for this study. A total of 30 individuals were interviewed. An interpretivist framework was adopted to articulate the subjective 'reality' of how the experts perceive their knowledge contribution to the organisation. To provide an explanatory insight into the experts' perspectives on knowledge loss, sample of eight cases of experts were written. These emphasise themes pertaining to the key concepts in a given domain: expert knowledge; knowledge contributions; and knowledge management and support.

The findings provide a strong understanding of the knowledge contribution and knowledge capabilities of experts in the organisation that is being studied. The findings are also indicative of how the experts view the potential loss of knowledge that may occur upon their departure from the organisation. The findings are particularly relevant to the broader manufacturing sector, as well as the mining industry, in seeking to manage critical knowledge which can be retained in the wake of expert employee departures. The dissertation findings contribute to the extension of the SECI KM Model by capturing the experiences of the expert's *workworld* that is critical for organisational memory, knowledge transfer, and learning. The dissertation also makes a number of practical recommendations about expert knowledge retention for learning and transferring knowledge.

DECLARATION

I, Selvi Kannan, declare that the PhD thesis entitled *Perspectives on Knowledge Retention and Loss from Expert Attrition – An Organisational Case Study* is no more than 100,000 words in length including quotes and exclusive of tables, figures, appendices, references and footnotes. This thesis contains no material that has been submitted previously, in whole or in part, for the award of any other academic degree or diploma. Except where otherwise indicated, this thesis is my own work.

Selvi Kannan Date

ACKNOWLEDGMENTS

First and foremost, to my parents whose life experiences helped me appreciate many things in life. Thanks for always being there for me.

My sons, Ruben and Shaun, I cannot thank you enough for your acceptance, patience and humour that supported me in continuing this journey.

Humble thanks to Damien, who opened the door for me.

To Stephen Smith, President and CEO, John Wiley & Sons Inc, who was a charismatic, fast-forward and inspiring leader who seeded the awareness of how experience was critical to an organisation, back in the 1990s.

Special thanks to Professor Pam Green, Professor Christopher Selvarajah and Professor Philip Taylor in being part of my learning journey. Professor Eric Stein and Professor Bruce Tranter who never failed to be the listening ear from time to time—many thanks.

I thank my supervisors, Dr Shah Miah and Professor Michael McGrath, for guiding me through to completion. This would not have been possible without both of you and I am very grateful.

Last but not the least, I am grateful to all who have crossed my path and taught me the true meaning of perseverance and motivation.

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CHAPTER 1 – INTRODUCTION

1.1 Background And Context

A major challenge facing 21st century organisations is the question of how to retain employees' acquired knowledge and expertise, at a time when the workforce is ageing and when there is less likelihood of career longevity. Long-serving employees who develop organisational knowledge over time and possess deep, specialised expertise in their field of work are known as 'experts' (Jorgensen, 2005; Leonard, Swap, & Barton, 2014). Organisations cannot afford to lose the valuable knowledge of departing experts who are reaching the end of their careers (Jorgensen, 2005; Lahaie, 2005; Ebrahimi, Saives, & Holford, 2008; Streb, Voelpel & Leibold, 2008).

The problem of retaining valuable organisational expertise presents a major challenge for several reasons: the ageing workforce means that large numbers of employees are rapidly approaching retirement; there is a decline in career longevity (Aiman-Smith, Bergey, Cantwell, & Doran, 2006; Festing & Schäfer, 2014); and there are a large number of entry-level recruits who possess limited or no skills.

Knowledge and skills are considered to be critical strategic resources (Bender & Fish, 2000; Martins & Martins, 2011). For organisations, the loss of those resources has a number of implications:

a) Some tacit knowledge may be lost permanently.
b) Replacing organisational knowledge incurs direct and indirect monetary costs.
c) Loss of knowledge can lead to inefficient processes, procedures, and loss of competitiveness. This can ultimately expose the organisation to competitive risks (Delong, 2004).

Replacing the job-related knowledge, skills, and abilities of departing employees is straightforward in some cases, but it can be much more difficult to replace knowledge gained from extensive experience (Strack, Baier, & Fahlender, 2008) or elite expertise (Pobst, 2014). Management scholars have argued that knowledge held by employees is a key competitive resource (Penrose, 1959; Barney, 1991; Drucker, 1993; Davenport and Prusak, 1998; Argote & Ingram, 2000; Darroch, 2005; Marjanovic, 2013). Given that key thinkers have pointed to the importance of skills and experience as a key competitive resource, it

makes sense for organisations to investigate knowledge acquisition, knowledge transmission and knowledge loss with a view to retaining knowledge resources.

This dissertation aims to explain the phenomenon of knowledge loss by capturing the perspectives of workplace experts. In particular, the dissertation aims to provide an understanding of what an expert views and values about their knowledge contribution in relation to their work practice, actions and decisions and how they view this as knowledge contribution as a loss to their organisation upon their departure.

1.2 The Research Problem: Knowledge Loss

A number of environmental factors contribute to the unprecedented exodus of older workers from the workforce. These factors contribute to net knowledge loss, and that loss has consequences at global, economic and industry levels. At the organisational level, an understanding of the loss of critical knowledge for organisational sustainability and its implications for organisational performance is essential to an understanding of knowledge management (KM). Environmental factors such as workforce ageing, a trend in the decline of career longevity, and a reduction of skills amongst entry-level recruits, combine to place more pressure on organisations to consider how they manage organisational knowledge.

Green (2015a) has argued that Australia's challenge is to maintain competitiveness through knowledge and ingenuity. The author notes that the manufacturing industry has been instrumental in nurturing generations of science and engineering experts, and now faces the challenge of knowledge loss as many workers who were initially trained in manufacturing have moved to other sectors due to manufacturing's decline. This has left the industry with under-skilled and under-experienced workers at a time when Australia is heavily reliant on the decades of experience required to spearhead innovation (Green, 2015b).

1.2.1 Challenges Associated with the Ageing Workforce

Population ageing has shifted workforce dynamics in the majority of developed economies (including Australia) over the last two decades. The ageing of the workforce presents a socio-economic challenge for the distribution of both work and income. This challenge is predicted to affect the Australian workforce until at least 2050 (Australian Productivity Commission, 2013).

Baby boomers (those born between approximately 1943 and 1960) constitute the older tier of Australia's ageing workforce. The baby boomer generation will be retiring in increasing numbers by 2051 and the number of baby boomers retiring is estimated to be between 2.5

and 7.2 million (Productivity Commission, 2013). The oldest baby boomers had reached 65 years in 2012, and 65 years is the age when Australians have traditionally retired from full-time employment. In 2015, many baby boomers had already retired, were commencing retirement, or were planning retirement, while yet others were planning to continue working for as long as practical (Chandler, 2012). The most recent Intergenerational Report commissioned in Australia (2015) predicts that the number of workers aged 65 years and older will increase by 17.3% (Henry, 2011). The implications of an ageing workforce are far-reaching. By 2051, an older workforce will affect trade and Australia's average income growth (Diewert, 2012; Gruen, 2012; Australian Government Productivity Commission, 2015). Shifting workforce demographics are already having a notable effect on organisations across a variety of industries and geographies (Leibold & Voelpel, 2006).

Importantly, the ageing workforce has implications for KM and knowledge retention within organisations (Ebrahimi et al., 2008; Jorgensen, 2005; Lahaie, 2005; Streb et al., 2008). The increasing number of employees who are departing due to retirement, places the organisation at risk of sustaining competitive business (Lesser & Rivera, 2006; Jennex, 2014). Long-serving (most of them belonging to the ageing workforce cluster) employees possess a combination of tacit and explicit knowledge that has become the most 'strategically significant resource of organisations' (Calo, 2008, p. 404). Glick (2007) similarly argues: 'As the baby boomer generation prepares for retirement, organisations want to be sure that the knowledge and experience gained by them does not walk out the door when they do' (p. 11).

In relation to knowledge, the issue of the ageing workforce is exacerbated by a number of other challenges that are faced by organisations. These challenges include: (a) a reduced number of graduates entering industries with specialist qualifications; (b) many employees are seeking work-lifestyle balance (Dychtwald, Erickson & Morison, 2006); (c) the cohort born between 1977 and 1997 (also known as 'the millennials') seem to stay less than three years in a job, which itself poses a risk to factors (including knowledge retention, experience accumulation, and organisational engagement) that can impact the success of an organisation (Meister, 2012). Furthermore, the manufacturing sector itself faces challenges. For example, there have been lower levels of education attainment in the manufacturing sector, and this is because there has been an overall decline in individuals with the appropriate qualifications within this sector. Research undertaken by the Department of Employment reports that some organisations consider that graduates lack practical skills and experience, even though there are graduates with relevant qualifications (Australian Government Department of Employment, 2014; Australian Government Depart of Employment, 2015)

1.2.2 Domain-Specific Knowledge within the Mining Industry and Manufacturing Sector

The mining industry has long been economically important for Australia. The *Key Performance Measures Report* (2015) reported that the mining sector contributed 9.8% of GDP, and the manufacturing sector contributed 7.5% of GDP (Productivity Commission Australia, 2015; Manufacturing Skills, 2012). Despite the declining mining industry and manufacturing sector, Australia still leads in capital investment and output, and is the fourth largest employer across the entire economy (Barnes, Soames, Li, & Munoz, 2013).

The factors discussed in the preceding section suggest that the domain-specific knowledge possessed by specialists and experts represents a critical factor in understanding organisational competitiveness. Given that mining and manufacturing are process-driven industries, they require a workforce with domain–specific knowledge with high levels of experience (Kim, Hwang, & Suh, 2003). The Australasian Institute of Mining and Metallurgy (AusIMM) (http://www.ausimm.com.au/) has identified production workers in the mining industry and manufacturing sector (including mining engineers, metallurgical engineers, and geotechnical engineers) to be the sector's key specialists. The AusIMM noted that (since its inception in 1893) the Australian mining industry has faced numerous specialist workforce issues such as decreasing engineering specialist role opportunities that risk 'loss of good people who may not return and can never be replaced' (Catchpole, 2015, p.1). Those 'good people', or specialists, have not only had domain-specific knowledge, but they have also had years of experience. The fact that only 27 percent of mining engineering graduates specializing in geology enter this industry suggests that there could be a potential impact on the transfer of skills and experience (Sims, 2015). Especially affected in the domain-specific knowledge were the areas of earth science, metallurgy and mining (Sims, 2015).

The environmental factors discussed in the earlier section present combined pressures on organisational knowledge management and retention. When experienced employees retire or depart from an organisation, organisations can potentially suffer a net knowledge loss. This is even despite the fact that new recruits may be able to match experienced workers in terms of qualifications. A number of questions are raised here, including: Is this experiential knowledge vital for an organisation's performance? What knowledge gaps will occur? Is there a framework by which organisations can assess the value of experiential knowledge and address the learning-related challenges needed to fill the gaps? Could organisations that ignore the loss of knowledge expose themselves to potential risks in terms of reduced

efficiency, increased training costs, and declining competitiveness? These questions will be addressed throughout the thesis.

1.3 Organisational Context: The Knowledge Boundary of Experts

The unique insights, and peculiar characteristics of the organisational culture developed over time are what renders acquired knowledge difficult to replicate or replace when employees transfer out of their positions (Leibold & Voelpel, 2006). As Nyilasy and Reid (2009) argue, practitioners autonomously create knowledge within the boundaries of their work practice. This accumulated knowledge becomes expertise.

The term 'expertise' refers to an expert's use of domain-specific knowledge, skills, and experience (Warr, 2002; Ericsson, 2006a) that result 'from the accumulation of a large body of knowledge' (Chi, 2006, p. 167). Kanfer and Ackerman (2004) point to a strong positive association between an adult's age and their knowledge level. For organisations, the implications are clear: as employees 'age' with the organisation (age here refers to longevity, as well as the specialisation in a role or field), they acquire a knowledge set that is personalised and tailored to the organisation's operations, structure, and culture (Leibold & Voelpel, 2006).

1.4 Aim of the Dissertation

As suggested earlier, the ageing workforce poses unique challenges for the organisational competitiveness that many organisations now face, and these challenges include the current or planned retirement of an entire generation of mature and highly experienced workers. In their workplace studies, Edwards (2011) and Martins and Martins (2011) concluded that the biggest contributor to employee turnover is knowledge loss. Prior to this, Wiig (1997) had argued that little research exists on experts' contributions to organisations, as well as on the loss of knowledge that can happen when experts depart organisations. Since then, a number of scholars have addressed this gap in the literature about knowledge loss (Delong, 2004; McQuade et al.'s, 2007; Jennex, 2014). This slow identification has mainly been because much of the early KM research focused on the taxonomy of knowledge and KM systems (including both tacit and explicit knowledge), and barely canvassed the human aspects of managing knowledge and retention (Sigala & Chalkiti, 2007). Although there is now considerable KM literature concerning the capturing, codifying, and storing of knowledge, there is still little literature that focuses explicitly on knowledge, skills, and experience. The gap applies to literature on workforce knowledge and workforce types— specialist fields,

generational factors, or the use of KM as a lens or conceptualisation through which to understand knowledge loss.

The purpose of this dissertation is, therefore, to address the organisational impacts of departing experts, particularly on the retention of organisational knowledge from an expert's perspective rather than from the organisation's perspective. The dissertation studies the role, involvement, engagement, and contribution of knowledge of experts in an organisation. The experts' perspectives on the contribution of their knowledge to the achievement of organisational success are explored. In an interactive form, the researcher engages with the experts to understand, from their perspectives, what knowledge they contribute to the organisation and how they see their departure as impacting the organisation. Senge (1990) and Roy (2012) have argued that more needs to be done to close the gap between organisational knowledge and learning. This dissertation aims to fill that gap.

This dissertation aims to contribute to the KM field by exploring how the knowledge loss that is caused by the departure of experts can impact on organisational success. In doing this, the dissertation will use a KM model as a lens.

1.5 Rationale and Study Method

Retention, turnover, and intent to leave are major obstacles to organisational success in Australia and globally (Glick, 2007; Newk-Fon, Venable, & Dell, 2012). The dissertation focuses on the impact that departing experts can have on organisational culture, expert knowledge dissemination, knowledge retention, integrity, and continuous learning. As the themes emerge from the experts' perspectives, the KM lens offers additional insights in order to help generate strategies for the protection of vital organisational expertise resources.

The existing literature has three major shortcomings. Firstly, the research conducted on knowledge loss is scarce in terms of both theoretical contributions and empirical evidence. Secondly, the literature has largely focussed on explicit and tacit knowledge, and on 'recipe-remedies' or ad-hoc solutions for KM issues. For example, McQuade et al. (2007) undertook a research project to identify the potential loss of organisational knowledge and expertise that takes place when expert employees retire. The authors interviewed experienced workers and experts who had already retired or were approaching retirement, specifically examining interpersonal communication skills. The findings provided insights into transferrable training and succession planning. The authors comment, though, that 'there is no substitute for experience in the company' (p.766).

Thirdly, there is opportunity to tie in a theoretical model with the practitioners' perspectives. For example, a recent study by Jennex (2014) used applied research based on systems analysis to assess the risk of knowledge loss arising from employee departures. The findings offered a guide to capturing knowledge before it is lost. These studies show that there is no single structured approach to research. Additionally, the complex nature of knowledge and organisational contexts requires a research approach that is not limited by strict boundaries. Both McQuade et al.'s (2007) and Jennex's (2014) studies failed to apply a KM model to provide understanding on knowledge loss.

Furthermore, empirical research on KM in both the mining industry and manufacturing sector is limited. As the mining industry and manufacturing sector experience major challenges and changes, the need to retain expertise and knowledge is acute. Thus, the notion of effective and customised knowledge transfer through learning and sharing within an organisation becomes fundamental for ensuring ongoing organisational effectiveness (Lahaie, 2005; Piktials & Greenes, 2008; Wagner, 2009).

To contribute to the KM field, the dissertation takes a case study approach to a real social organisational world in order to elicit stories of how experts contribute through their work practice. This qualitative methodology is ideally suited to gaining an understanding of the practitioners' perspectives; and facilitating the process of capturing the fluidity and complexity of knowledge, along with the extent to which knowledge can impact an organisation (Nyilasy & Reid, 2009). Scholarship in the KM literature reveals the complexity of knowledge, while stories provided by the experts provide in-depth and persuasive information (Yoo, Kreuter, Lai, & Fu, 2014) in the real context (Briody, Meerwarth, & Trotter, 2012). These stories allow for an understanding of how knowledge is bounded by context, the complexity of knowledge contribution, and the building of expertise. Furthermore, the stories that unfold provide insights into the ways that the expert's work journeys, critical incidents, motivations, and learning all significantly contribute to, and affect their knowledge contribution. This approach encourages interpretation and reflexivity, which scholars and practitioners can further apply in order to take the discussion of managing knowledge beyond the tacit and explicit forms of knowledge.

An organisation from the mining industry with a manufacturing arm was selected for the current research for several key reasons, namely:

1. The mining industry and manufacturing sector are both significantly affected by the ageing of the workforce (Productivity Commission Australia, 2013).

2. Both the mining and manufacturing industries attract a number of professional experts (mainly engineers and geologists) with high levels of domain-specific knowledge (Green, 2015a).
3. Both the mining industry and manufacturing sector in Australia are currently in a state of transformation (Green, 2015a).
4. The focus organisation was willing to permit the research study by allowing the researcher to conduct in-depth interviews with employees.
5. The contribution to be made by the dissertation as a whole to the theoretical and practical KM literature.
6. The organisation in question is unique because it also has a manufacturing arm.

1.6 Research Questions

The current research sought to investigate the implications of the departure of experts, by retirement, resignation, or redundancy. A series of sub-questions sought a deeper understanding of experts and how they contributed contextual organisation-specific knowledge and experience with respect to the business performance of the organisation. Thus, the main research question was:

> How do Gothamfield's expert employees perceive their knowledge contribution to this organisation, and how (following their departure) will the loss of this knowledge affect the organisation?

The research sub-questions were as follows:

1. What do their knowledge, skills, and experiences mean to the experts?
2. What is the experts' understanding of how others in the organisation perceive their knowledge contribution?
3. How do the experts perceive the prospect of the loss of their knowledge when they leave the organisation?

1.7 The Significance of the Dissertation

Inayatullah (2003) noted that ageing should be considered neither a burden nor a foundational problem, but rather a resource for systemic and civilisation revitalisation. The subjectivities of this ageing demographic require understanding so that organisations can appreciate the challenges inherent in the future, and can take action to sustain their competitiveness. The phenomenon of an ageing workforce requires a shift in thinking and the adoption of diverse workforce measures using KM practices and processes to harness

and create inter-capability relationship between the generations, talents, and expertise. A contribution this dissertation makes involves drawing on the literature of experts, organisational knowledge and learning, to provide an integrated understanding of the knowledge held by these experts. The literature review in Chapter 2 demonstrates not only the complexity of this knowledge, but also the extent of knowledge that is held by a particular individual.

Generalising from the research case studies on the experts, the key findings of the dissertation contribute to the field of KM literature, particularly because, as noted, there is only a limited body of existing literature dealing with this specific KM domain. Furthermore, the organisation case study contributes to the understanding of KM as a socio-technical concept, where human, organisational and technological aspects are combined. The theoretical contributions gleaned from this dissertation's literature review lead to findings that extend the Socialisation, Externalisation, Combination and Internalisation (SECI) model (Nonaka & Takeuchi, 1995). Using the SECI KM model as a lens enables an understanding of the knowledge contribution and potential loss that can occur within the context of the organisation.

1.8 The Organisation of the Dissertation

Pseudonyms were used to maintain the confidentiality and anonymity of the participants. Table 1 shows the pseudonyms adopted for the organisation, the region the organisation was operating from, and the experts.

Table 1: Pseudonyms

Pseudonym of Organisation		Gothamfield	
Pseudonym of Region Organisation is Positioned		District 1	
Code Number in NVivo	**Pseudonym in Case Study**	**Code Number in NVivo**	**Pseudonym in Case Study**
FP01	Gabriel	FP16	Marcus
FP02	Expert	FP17	Menzies
FP03	Mia	FP18	Franz
FP04	Eric	FP19	Expert

FP05	Roberto	FP20	Expert
FP06	Adriano	FP21	Expert
FP07	David	FP22	Cadet
FP08	Expert	FP23	Management
FP09	Expert	FP24	Management
FP10	Pablo	FP25	Management
FP11	Dennis	FP26	Expert
FP12	Expert	FP27	Cadet
FP13	Expert	FP28	Cadet
FP14	Expert	FP29	Cadet
FP15	Expert	FP30	Cadet

The organisation of the dissertation is to address the key research question. The chapters outlined below address the literature, the case study approach, data collection, analysis, findings, and recommendations. These chapters aim to provide a holistic understanding of the expert's perspective on knowledge loss. The discussions focus on the perspectives of the experts, who are particularly aware of what knowledge capabilities they possess and what it means to the organisation.

Chapter 2 – This chapter provides a review of the literature that is relevant to the main research question. The literature is organised by reviewing the key theoretical concepts: (1) expert knowledge; (2) knowledge contributions; and (3) KM and support.

Chapter 3 – This chapter elaborates on the case study approach and thematic methodology applied in this dissertation. The chapter also discusses the strategy and process used and the appropriateness of the method used.

Chapter 4 – This chapter sets the context for the organisational case study. The context of the region, the mining industry and manufacturing sector, the backdrop of the ageing workforce, and the organisation being focussed on in this dissertation are discussed.

Chapter 5 – This chapter presents a sample of eight individual cases of experts employed with the organisation. The aim of providing the individual case studies is to obtain the

experts' perspectives on the temporality of their knowledge, skills, and experience; and provide a holistic understanding of the practitioners' perspectives on the knowledge loss that could take place when they depart the organisation.

Chapter 6 – This chapter details the results of the data captured, as well as the coding of the data. Both of these data-related initiatives develop categories and concepts within the data and identify the relationships between the categories.

Chapter 7 – This chapter constructs a conceptual framework, using the literature review and SECI KM framework, to analyse and interpret the findings.

Chapter 8 – This chapter shows that the findings lead to meaningful recommendations for similar types of businesses, address the loss of expert knowledge, and demonstrate that future research will add to the existing KM literature.

1.9 Chapter Summary

This chapter has provided an overview of the context for this dissertation. The chapter has also provided a brief outline of the relevant literature in the area of organisational knowledge loss from the perspectives of experts in a mining and manufacturing organisation in Australia, with a view to identifying a research gap that the current study can fill. The following chapter sets the boundaries for the dissertation.

CHAPTER 2 – LITERATURE REVIEW

2.1 Introduction

The aim of this dissertation is to increase our understanding of expert knowledge loss and the consequences of such loss for organisations. Thus, this literature review will provide a discussion of theories and concepts from the core literature of expert knowledge integrated with organisational contexts. These theories and concepts form the basis of this dissertation. At the same time, the literature review seeks to justify the original contributions made by the thesis.

The review is composed of three main sections. The first section examines expert knowledge and attributes. The second section demonstrates the significance of expert knowledge for organisational performance. The third section provides a discussion of experts' contributions to organisations, and how these contributions demonstrate the value of an individual's commitment and learning to ensuring organisational sustainability. These three main sections form the basis of a KM framework to support organisational knowledge retention and application.

The researcher aims to draw on the relevant literature to establish the justifications for the experts' perspectives concerning their knowledge contributions and the potential knowledge loss that could take place upon their departure. Martins and Martins (2011) have argued that loss of knowledge can lead to tacit knowledge being lost permanently, and this loss has both direct and indirect implications for the organisation. For example, this loss can lead to inefficient processes and procedures that could, in turn, adversely impact an organisation's competitiveness. The literature review aims to determine what an individual expert's critical knowledge contribution to an organisation is. Drawing on the literature outlined below, the researcher will attempt to ascertain what knowledge will be lost when an expert leaves the organisation.

This dissertation begins with the assertion that knowledge and knowledge management are valuable resources in the 21st century global economy (Al-Hawamdeh, 2003; Gardner, Francesca, & Staats, 2012; Nag & Gioia, 2012; Argote, 2013). Studies have recognised that employee knowledge (often considered human capital) can be lost when employees depart the organisation either due to resignation or retirement (Bauner & Becker, 2006; Somaya & Williamson, 2008; Krause & Semadeni, 2012; Daghfous, Belkhodja, & Angell, 2013).

Although there has been agreement amongst scholars regarding the probable loss of organisational knowledge as a result of staff departures (Delong & Davenport, 2003; Meyer & Maltin, 2010), there are few studies on the Australian organisational context. This thesis will fill that void.

This thesis uses an inductive case study methodology to investigate the issue of expert knowledge. Specific reference is made to the contribution, retention and sharing of expert knowledge; and potential expert knowledge loss in organisations. Organisational memory loss can result in process and production inefficiency, fractured social relationships, and increased staff turnover (Shah, 2000; Droege & Hoobler, 2003; Eckardt, Skaggs, & Youndt, 2014). Studies show that organisations are developing strategies to address such knowledge loss; and to measure the negative impacts of this loss, without considering the organisation's existing knowledge capability and the value that the individuals in the workforce contribute in their own significant ways (Jimenez-Jimenez, Costa, & Sanz-Valle, 2014). Some research suggests that capabilities are developed as an individual learns on the job (Nonaka, 1994; Dougherty & Bowman, 1995; Prahalad & Hamel, 2013). These capabilities are said to form a unique knowledge contribution to the organisation that may be critical for achieving a sustainable competitive advantage. More recent studies by Manhart and Thalmann (2015) and Wensley and Navarro (2015) have shown that accumulated knowledge capability is critical for learning.

The discussion of capabilities of the workforce in the current economic conditions raises issues such as critical knowledge and skills shortages with increasing number of workers retiring. This thus creates challenges for organisations, especially in managing knowledge to sustain organisational performance and maintain business outputs (Finkelstein, Truxillo, Fraccaroli & Kanfer, 2015). These challenges include an ageing workforce, an intergenerational talent mix, outsourcing, sensitivity to outsourcing (particularly by professions where the spectrum of work involves national and international sensitivity, such as accounting and finance), cultural diversity, redundancy, retrenchment, renewal of workforce (replacing an ageing workforce with a younger workforce), and demands for increased work-life balance. These challenges are indicative of factors that include talent retention, and the overall potential impact of human and social capital on the organisation (Grant, 1996; Alakent, 2014; Nyberg, Molitero, Hale & Lepak, 2014). This thus creates challenges for organisations, especially in managing knowledge to sustain organisational performance and maintain business outputs.

In attempting to answer the research question, a review of the literature on human capital suggests that few studies have explicitly focused on knowledge loss (Haspeslagh and Jemison, 1991; Bruner, 2004; Deloitte, 2010; Ellis, Reus, Lamont, & Ranft, 2011; Bruner, 2004; Heimeriks, Schijven, & Gates, 2012). Of the empirically-based research studies that explicitly

investigate knowledge loss, several have focused on expert knowledge. For example, Van der Walt's (2006) large sample survey study of the effect of mergers and knowledge loss in an IT company was principally concerned with prevention strategies. Key findings suggest that factors pertaining to organisational culture (for example, communication and power) play significant roles in knowledge transfer. A study conducted by Piotroski (2006) compared the knowledge domain of experts and novices and found that experts have a deep knowledge structure. Joe's (2010) study, which specifically examined older expert workers in Information and Communication Technology (ICT) roles in a New Zealand organisation, sought to 'discover how an organisation described the types of knowledge that it considered as being valuable' (p.4). The findings of this study demonstrate connections between knowledge proficiency and wisdom related to expertise (however weak) in providing strong evidence about the way the studies were conducted.

A further gap in the literature is that empirical studies collected on experts and expert knowledge mainly utilise experimental designs and have used mainly psychometric tests (Krampe & Ericsson, 1996). For example, formalised studies using high cognitive testing methods have been undertaken with professionals (for example, engineers) (Cross, 2004). These experimental and longitudinal studies provide robust data for expert knowledge research. Because these studies are not conducted in a natural organisational setting, however, the experts involved may not draw on experience.

The sections that follow draw on elements that are critical to this research and provide a solid foundation for the material by exposing gaps and weaknesses. A key contribution made by this thesis involves drawing on the literature on expert and expertise and knowledge in organisational context, and conceptualising this literature within the KM SECI framework. The sections are intended to explain the significance of a KM framework and to demonstrate the deeper levels of knowledge contribution, sharing and loss within such a framework.

2.2 Expert Knowledge

This dissertation is fundamentally concerned with experts, organisational dependency on expert knowledge, and how the departure of that expert knowledge affects an organisation's performance. Within the expert knowledge literature, there is a thorough coverage of clinical and scientific experiments. Work on expert attributes, in relation to individual knowledge taxonomies, that show the contribution of an expert's knowledge within the organisational context is, however, thin. Therefore, the sections below explore the expert knowledge literature and attempt to integrate this literature with the KM literature.

2.2.1 Knowledge and Attributes

The term 'expert' generally refers to an individual with 10 or more years of practice experience, who exemplifies exceptional performance that can be attributed to 'deliberate practice' (Ericsson, Krampe & Tesch-Romer, 1993), and who uses 'domain-specific knowledge' (Schmidt, 2011) to respond to specific environments, situations, or problems (Leonard and Swap, 2005). A survey of the literature shows that the term 'expert' may refer to a multitude of attributes depending on proficiency levels within a profession. Hoffman (1998) describes an 'expert' as

> the distinguished or brilliant journeyman,[1] highly regarded by peers, whose judgements are uncommonly accurate and reliable, whose performance shows consummate skill and economy of effort, and who can deal effectively with certain types of rare or 'tough' cases (p.22).

The majority of scientific studies and experiments in the area of experts and expert performance are in the domain of arts or sports and span other general issues, practices, and learning (Ericsson, 2006b). These existing studies address the areas of development, training, reasoning, and innate talent. Given that these studies focus on elite performance, the extant research often overlooks expert performance in everyday workplace contexts.

The term 'experts' attributes' refers to those characteristics or traits exhibited by experienced individuals in the practice of their respective field of specialisation. One such attribute is deliberate practice or rehearsal, where high levels of expertise are observed (Ericsson et al., 1993, Horn & Masunaga, 2006). Deliberate practice involves repeating performance-improving activities within a field for an extended period. This implies that one of the defining attributes of an expert is the ability to engage in activities that improve the expert's performance. This engagement must be habitual and prolonged, and also entail constant learning, reflection, self-assessment, detection of errors, rectification of mistakes and, most importantly, performance improvement (Simon and Chase, 1973; Sassower, 1993; Chi, 2006). Given these requisites for deliberate performance, the judgement of an expert plays a significant role in helping the expert to determine which actions must be improved, and in what way (Choo and Johnston, 2004).

Recker, Safrudin, and Rosemann (2012) have explored the nature of routine practice in greater depth, noting that experts are recognised for their superior or extraordinary activities if they continually update their knowledge base, act reflectively, and identify opportunities for

[1] 'Literally, a person who can perform a day's labour unsupervised, although working under orders. An experienced and reliable worker, or one who has achieved a level of competence. Despite high levels of motivation, it is possible to remain at this proficiency level for life' (Chi, 2006, p.22).

premeditated practice that improve their levels of expertise. Such practice enables experts to gain exposure to new experiences and develop mental models that include new knowledge (St-Jean & Audet, 2012). Repeated practice can, however, lead to overconfidence and routinised, mechanical performance with potentially negative outcomes. For example, overconfidence and a lack of collaborative engagement between experts can lead to knowing loss within a defined practice space due to taking short-cuts and this may lead to scepticism among decision-makers who rely on expert judgements to support decisions (Cassidy and Buede, 2009; van Winkelen & McDermott, 2009). In establishing a general theoretical understanding of experts, there is a demarcation between experts and non-experts or novices. St-Jean and Audet (2012) explain that an expert's specialised knowledge and acquired skills are based on experience, the exercise of rationality, and political decision-making within a social context to an extent that is beyond the experience of other individuals.

The key difference between experts and novices is that an expert's deliberate practice improves their judgement and performance, and contributes to organisational success (Ericsson, 2006b). Expert and novice knowledge differ in extent where an expert's concepts are distinctly organised, and the individual's memories are addressed through concepts, contexts, and contents (Chi, Glaser, & Farr, 1988). Although experts are not always accurate (Dror, 2005; Dror & Charlton, 2006), they are competent, and have a greater tendency to realise successful outcomes compared to novice workers.

Novices are defined as individuals who are known to have built personal knowledge through education and are likely to lack practical knowledge, therefore rendering them less authoritative in reasoning, decision-making, know-how, and know-what with respect to action (Recker et al., 2010; St-Jean & Audet, 2012). The fundamental difference between experts and novices is their structuring of domain-specific knowledge, which affects their perception on any given situation from the outset (St-Jean & Audet, 2012). This perception grows with experience. Novices have little experience in the working context, and this is reflected in their performance.

Academic research has made substantial contributions towards understanding expert performance and knowledge. A review of the literature, however, has shown that considerably less attention has been paid to end-of-career experts and the organisational implications for capturing and retaining important knowledge in ways that benefit the organisation. Therefore, as discussed in the section below, this dissertation conducts a review of the literature on the problem of departing experts.

2.2.2 Departing Experts and the Workforce

De Long (2004) and Martins and Martins (2011) concur that lost knowledge will directly threaten an organisation's capabilities. This suggests that the loss of experiential knowledge involving learning and contextual knowing will leave a gap in organisations. Evidence from Australia has indicated that the departing workforce comprises predominantly ageing baby boomers and departing retirees (Australian Government Productivity Commission, 2013).

Empirical research strongly supports the view that, while organisations face the challenge of departing workers in various ways (especially due to retirement), knowledge loss is prevalent (Jorgensen, 2005; Lahaie, 2005; Ebrahimi et al., 2008; Streb et al., 2008). For instance, Ebrahimi et al.'s (2008) study of the high-tech aeronautical sector in Canada and Quebec (which is a major player in the global economy) identified that nearly 41 percent of its workforce was ageing and were holding highly qualified jobs. The findings showed that the ageing workforce's tacit knowledge was critical for their social and relational know-how. In a study across ten different industries, Streb et al. (2008) showed that the ageing workforce phenomenon was widespread. Their findings, however, also showed that management practices have failed to appreciate older workers' experiences, and have contributed little or no management of that knowledge. While these studies provide persuasive arguments for the potential loss of knowledge, they do not explicitly consider the experts' perspectives, and generally fail to provide insights on knowledge support mechanisms.

More recent research, such as that carried out by Dunham and Burt (2014) and Jennex (2014), has suggested that knowledge gained from retiring employees can be highly tacit because it is a combination of understanding gained from training, experience, and social interaction. Moreover, the retention of knowledge is particularly critical in the case of retiring experts, who possess rich organisational knowledge and also in-depth specialised knowledge of their field of work. The authors of the above studies assert that expert knowledge could be found in (a) the culture of the organisation; (b) the operation of the organisation; and (c) the successes and failures within the organisation (Lahaie, 2005; Huising, 2014).

Furthermore, Syverson (2011) stated that organisational productivity increases with accumulated experience, particularly when individuals who have worked in organisations for ten or more years create intangible knowledge reservoirs. These individuals are considered 'experts' (Ericsson, 1993). Discussion about experts and expertise has a long legacy; where the significance of expert knowledge in relation to organisations has assumed the form of intellectual capital and with recognition of individuals who have deep organisational knowledge (Choo & Bontis, 2002; Leonard & Swap, 2005). Even though the recent studies cited above

focus on knowledge within the organisational context, they are seemingly disparate and lack and do not focus to any great extent on the individualised level. Thus, the researcher draws on the fundamentals of Polyani's (1966) work and showcases the levels of knowledge held by an individual and further draws on other scholarly contributions in the various typology of knowledge held by an individual.

Polanyi (1966) posited that tacit knowledge could be described as human knowledge of which 'we can know more than we can tell' (p. 4). Humans absorb more information from outside sources and are confronted with limitations when sharing the information with others (Mitchell, 2006). Jovchelovitch (2007) postulated that knowledge has symbolic, personal, and social meaning for individuals that underlies the 'development of mind, self, societies, and culture' (p. 9). These definitions explain knowledge as a dynamic process of justifying personal beliefs towards truth (Polanyi, 1966; Bateson, 1979; Dretske, 1981; Nonaka, Toyama, & Konno, 2000). Knowledge is, therefore, not just tacit. Table 2 identifies the categories classified according to their cognitive contribution and has been adapted from Krogh, Roos and Kleine's (2000) study. Delineating one type of knowledge from another provides a foundation from which to identify the types of resources that are most at risk of loss when an expert departs an organisation, taking their expert knowledge with them. This delineation also provides a starting point for thinking about how different types of knowledge might be transmitted, codified and retained.

Table 2: Unfolding Complex Categories of Knowledge

Knowledge Types	Summary Explanation	Links to Literature
Tacit	A person knows more than he/she can express in words.	Polanyi (1958, 1966, 1969); Spender (1993).
Embodied	Knowledge results from experiences of physical presence (that is, project work). The emphasis lies on the process of knowledge development.	Zuboff (1988); Collins (1993); Blacker (1995); Nonaka and Takeuchi (1995).
Explicit and Encoded	Knowledge that is recorded and that remains in the company, for example, reports and regulations.	Zuboff (1988); Collins (1993); Blacker (1995).
Embrained	Knowledge that depends on the cognitive abilities that allow for the recognition of underlying patterns (for example, of a new industry), the reflection of basic assumptions, and the ability to synthesise.	Schon (1978); Fiol and Lyles (1985); Prahalad and Bettis (1986); Argyris and Collins (1993); Blackler (1995).
Embedded	Emphasis is on the process of knowledge construction. Knowledge is embedded in a variety of contextual factors and is not objectively pre-given. Shared knowledge is generated in different language systems, (organisational) cultures, and in (work) groups.	Berger and Luckmann (1966); Badaracco (1991); Brown and Duguid (1991); Astley and Zammuto (1992); Collins (1993).
Procedural	Knowledge encompasses processes and knowledge of assumptions within the process— 'if … then' scenarios. This type of knowledge consists of heuristics.	Ryle (1958); Winder (1987); Bohn (1994); Zander and Kogut (1995).
Declarative	Knowledge is the set of facts associated with the category, such as the attributes describing a type of situation. Declarative knowledge provides the database for understanding, reasoning, and interpreting situations.	Chi (1978); Larkin (1979); Sturmer, Konings, and Seidel (2013).
Situational	Knowledge is gathered from various situations in the domain practice. Knowledge originates from an environmental sense-making, mindset, as well as from thinking, agility, pattern recognition, and managing uncertainty (Osland., 2011, p. 25)	Osland and Bird (2006); Osland (2011)

Source: Adapted from Krogh et al. (2000)

Knowledge is not limited to the representation of cognition by information processing mechanisms (Alavi, Kayworth, & Leidner, 2006) because knowledge also consists of an individual's beliefs, emotions, motivations and perspectives (Bradley, Paul, & Seeman, 2004). Meyer and Maltin (2010), Bennet and Bennet (2007), and Alavi et al. (2006) view knowledge as the provider of understanding and the meaning of actions performed by individuals in an organisation. These researchers argue that knowledge lies in an individual's mind and is used to select and organise information, and to provide valuable information together with their self-directed motivation for the achievement of learning goals. Additionally, Bennet and Bennet (2007) state that knowledge is dependent on the potential and actual capacity of an individual 'to take effective action in varied and uncertain situations' (p. 28). This can lead to the individual setting learning goals.

From an organisational perspective, the knowledge contributed by an individual is often context-dependent. This means that the individual who holds the domain specific knowledge produces valued results in a particular context or situation. An individual's context-dependent knowledge gets refined, sharpened and changed as experience builds. This knowledge that the expert shares becomes part of the identity of the expert. Which in turn is recognised as expertise within their practice and the space that they work. For example, truth and value represent the understanding of an individual in particular situations, their relationships within the organisational system, and the ability to make sense of problems and resolve them (Bennet and Bennet, 2007). Nonaka et al. (2000) add that knowledge is created through social interactions and is context-specific, that is, knowledge is dependent on 'time and space' (p. 3).

Nonaka and Takeuchi (1995) and Sanchez and Heene (1997) argue that knowledge is highly significant at both the individual and organisational levels. At the individual level, knowledge allows the individual to responsibly act for the benefit of the organisation. Hence, at the individual level, knowledge is manifested through the individual's experience as 'performance' for the organisation. This performance is exemplified through their practice actions, judgements, and values. Knowledge is often considered an asset or possession of the individual. The organisation, however, also benefits from this knowledge because knowledge can be seen as an intangible intellectual asset that places the organisation in a competitive position. Sanchez and Heene (1997) argue that knowledge assets are beneficial only when an organisation can recognise and manage knowledge quickly and extensively. These scholars raise critical issues concerning the knowledge held by an individual that is valuable to the organisation, emphasising that knowledge is time-, space- and context-relevant.

In summary, recognising the various attributes of knowledge can highlight the unique contribution that each individual brings to an organisation. While the complexity of individual knowledge defies a comprehensive typology, academic research has made attempts to categorise broad classes of knowledge.

It is outside the scope of this dissertation to theoretically delineate between different types of knowledge; thus, the term 'knowledge structure' will be used throughout this dissertation to collectively draw on categories of knowledge. While a great deal is known about expert knowledge, it is also important to understand the critical aspects of an individual's knowledge structure. The following section discusses individual knowledge structure by addressing significant elements of an expert knowledge base. This will help to demonstrate that knowledge contribution is unique and that managing knowledge becomes even more critical for organisations that wish to capture the memories for future learning.

2.2.3 Knowledge Structure

Discussions about knowledge structure are relatively recent in the social cognition field. In this dissertation, the notion of knowledge structure is based on the arguments of Neisser (1988), Kilstrom and Klein (1994), Ditzfeld and Showers (2014), and Liben (2014). These scholars assume the perspective that knowledge is self-identified with five constituents: (a) the ecological self (person and environment); (b) the interpersonal self (interactions); (c) the conceptual self (learning of self through experience and examples in a social context); (d) the extended self (autobiographical memory); and (e) the private self (realisation and reflection of thoughts and experiences).

Knowledge structure is defined as knowledge that encompasses tacit information, action, and the extraction of commonalities from incidents traced from memory and applied to future work (Ohlsson, 2011). This knowledge structure varies from individual to individual. Both experts and their organisations view the knowledge structure of memory as significant because it reflects the way in which knowledge is captured, retained, and reused (Weitz, Sujan & Sunan, 1986; Sanchez & Heene, 1997). For example, Weitz et al.'s (1986) study of salespeople explained how knowledgeable salespeople categorise situations based on similar events. Sales representatives collect customer experiences (successful or otherwise) which can be retrieved from memory and applied to subsequent customer interactions. In a study of chess-masters, Simon and Gilmartin (1973) showed that chess experts store at least 50,000 chessboard configurations in their memory bank.

Knowledge structure relates to cognitive aspects whereby an expert draws on his or her domain-specific knowledge. The structure of an expert's domain-specific knowledge involves a combination of technical knowledge with the sense-making of cultural and relational scenarios. For example, Stevenson (2003), Hustad (2004), and Koedinger (2014) use the meaning from one context and apply it to another to solve high-level sense-making problems. Thus, the key capabilities involve a range of capabilities that include technical knowledge, interpretive skills, and the ability to recognise familiar scenarios. These capability variables vary from individual to individual. Experts build expertise by interconnecting meanings gained from their experience with domain-specific knowledge to perform tasks with minimal or no risk and to solve problems in a creative way. This also explains why one expert can outperform another with equal experience in a domain-specific area. These differences are not limited to cognitive ability but overlap with aptitudes and achievements in relation to domains and to combinations of beliefs and perspectives (Snow, 1979, 1980, 1996; Snow and Lohman, 1984; Mieg, 2014).

Beliefs are part of an individual's world view. They are formed throughout childhood and are linked to socio-environment influences (Eysenck, 1990; Reiss, 1997). Individuals tap into and utilise acquired personal experiences stored in memory, the patterns for which are recognised in relation to the domain that forms their knowledge base (Csikszentmihalyi, 1988). The patterns consist of facts, principles, and domain inquiries (Chi, Glasser, & Farr, 1988; Ericsson & Smith, 1991).

A significant dimension of the knowledge base that distinguishes experts from novices is domain-specific knowledge, which forms the basis of the following section.

2.2.4 Domain-Specific Knowledge

Domain-specific knowledge refers to knowledge relevant to a certain environment, situation, or class of problems. This knowledge is gained through cognitive engagement and learning in a particular field of study (Mayer, 1996; Ericsson, 2003). Studies conducted by Chase and Simon (1973), Anderson (1981), Chi, Glaser, and Farr (1988), Bloom (1996), and Ericsson (2003) on expertise and experience show that domain-specific knowledge is highly influential in expert performance.

Domain-specific knowledge is influenced by memories and problem-solving, as well as by the insights and wisdom gained from the comparison of perspectives. Experts build expertise by connecting the meanings of their experiences with their domain-specific knowledge; in this way, tasks are performed with little or no risk, and problems are solved creatively. A large part of problem-solving involves domain-specific knowledge. Experts have the capacity to take

meaning from one context and apply it to another to solve problems that require a high level of sense-making and application (Stevenson, 2003; Hustad, 2004). The early work of Simon and Chase (1973) defines domain-specific knowledge as a confluence of intellectual knowing in a specific area that is grounded, independent, and provides the ability to apply complex thinking. Domain-specific knowledge increases problem-solving accuracy and speed with practice; indeed, domain-specific skills are acquired through practice.

The accumulation of domain-specific knowledge through experience distinguishes an individual from an expert (Schmidt, 2011). Scholars such as Crossnan, Lane and and White (1999), Daley (1999), and Argote, McElvily and Ingrams (2003) argue that the theoretical and empirical studies of knowledge and expertise have evolved over two generations. The first generation of researchers focused on domain-specific knowledge and memory, whereas the subsequent generations of researchers have focused on high-level problem-solving. In the field of expertise, scholars from both first and second generations have argued that yet another generation of study is required. The literature is arguably entering a third generation where the focus is more concerned with understanding how expert knowledge contributes to an organisation's competitive performance.

This dissertation is firmly grounded in this third generation of expertise research because it explains experts' contribution of knowledge and skills to an organisation's competitive performance; and examines the potential loss of this knowledge, particularly considering the mix of intergenerational experts and novices. Also contributing to this third generation of studies is a narrative approach that addresses the layers of tacit knowledge that fluidly connects within the experts' thinking and actions.

2.2.5 Tacit Knowledge and Knowing

This dissertation's use of tacit knowledge is informed by Polanyi (1962), who defines tacit knowledge or knowing as 'human knowledge by starting from the fact that we can know more than we can tell' (p. 4); and by Barnard (1938) and Schon (1983), who acknowledge that tacit knowledge includes logical and non-logical thinking processes that cannot be expressed in words but only through actions, decisions, and judgements. These definitions are further justified through Colonia-Willner's (1998) studies on older bank managers and the dependency on acquired tacit knowledge for professional success; and by Venkitachalam and Busch's (2012) argument that tacit knowledge is the accumulation of implicit knowledge acquired through organisational routines.

Alexander (1968), Nonaka (1991), Patriotta (2003), and Panahi,Watson, and Partridge (2012) argue that tacit knowledge is context-specific, and the value of knowledge in organisations is dependent on the interaction between the individual and the organisation where knowledge is organised and diffused in a specific way. Determining the extent of organisational knowledge loss is complex, because managerial know-how is laden with variables such as experience, emotions, power, control, perceived reduction of uncertainty, and the understanding of present and past circumstances (Leonard & Swap, 2005; Cassiman & Veugelers, 2006).

Consistent with the literature, this dissertation acknowledges that tacit knowledge (for example, know-what and know-how) emerges from an epistemological perspective. Knowledge consists of scientific, factual, and socially-constructed elements. The first type of knowledge, 'know-what', represents an objective, task-related type of knowledge. In contrast, 'know-how' emphasises the value of experience that is subjective and implicit because it requires reflection and conceptualisation (Ipe, 2003). While differences exist between know-what and know-how, the two nevertheless complement each other. Researchers suggest that know-what is made practicable through know-how (Brown & Duguid, 1998; Carter & Scarbrough, 2001; Duguid, 2005). Know-what is acquired through explicit information that is available in circulation. Know-how is acquired through implicit information and requires combined personal knowledge and tacit insights that are gained through experience (Duguid, 2005).

Knowing and gaining experience and insights also occurs in groups and communities. KM and intellectual capital scholars generally agree that the know-what and know-how of individuals who have worked for 10 or more years in an organisation create strategic core capabilities and act as intangible knowledge reservoirs within the organisation. These knowledge reservoirs are individually- and group-owned and held. The depth of the reservoirs reflects the depth of knowledge held by individuals. The individual exploits these levels of knowledge in order to build his or her experience. This development or pursuit of deeper levels of skills and knowledge is largely driven by an individual's motivation. The following section discusses the literature on motivation and self-development, and links these factors with the individual's experience and expertise.

2.2.6 Emotions, Motivation, and Self-Determination

'Expertise is not an endpoint, it is a continuum' (Sosniak, 2006, p.300)

Given that the acquisition of expertise is a journey, emotions and motivation play a significant role in an individual's pursuit of meaningful engagement and experience at work. Ashforth and Humphrey (1995) argue that emotions in the workplace do not just involve the generalised

confined studies of satisfaction, dissatisfaction, or commitment. Emotions, in fact, play a vital role in controlling experience and, as Matsumoto and Sanders (1988) argue, it is inseparable to tasks and activities. This dissertation argues that the integration knowledge acquisition and emotions represents a gap in the literature. Ericsson (2006) and others (Vroom, 1964; Ryan, Kuhl, & Deci, 1997) have argued that motivation and emotions affect the acquisition of knowledge and ultimately expertise. A gap identified from the expertise literature can be found in the discussion of self-determination theory and its link with the pursuit of expertise.

In relation to motivation, Vroom's (1964) expectancy theory places significance on individual cognition, perception, and decisions as to how to behave on the trajectory of the basic premise of conscious choice. As Lunenburg (2011) clearly states:

> expectancy theory is a cognitive process theory of motivation that is based on the idea that people believe there are relationships between the effort they put forth at work, the performance they achieve from that effort, and the rewards they receive from their effort and performance (p.1).

Vroom's (1964) theory suggests three elements: valance, expectancy, and instrumentality. Valance is the individual's choice of intrinsic and extrinsic orientation to be rewarded. Expectancy is the level of effort the individual exerts to achieve better performance. Instrumentality refers to how the individual perceives a reward as an outcome when performance is met.

Drawing on Vroom's expectancy theory and self-determination theory, Ryan et al. (1997) offers a refined view of motivation through an understanding of where feelings and competency are used to demonstrate how autonomy is critical for intrinsic motivation. Gagné and Deci (2005) posit that self-determination theory 'postulates that when people experience satisfaction of their needs for relatedness and competence with respect to behaviour, they will tend to internalize its value and regulation' (p.337). Gagne and Deci (2005) further argue that when autonomous motivation and uncontrolled motivation are the drivers in the workplace, individuals tend to be engaged through their personal initiatives, which are also endorsed by others. This, in turn, causes effective performance.

2.2.7 Experience and Expertise

Experts play significant and influential roles in organisations, through their actions, decision-making and interpretations (Choo & Johnston, 2004; Jackson & Klobas, 2010) and are thus integral to the success of any organisation. Part of what makes experts so important is the

amount of expertise and experience that they possess and have at their disposal, or at the disposal of the organisation.

In many cases, expertise and experience are significant factors determining the success of a body or an organisation (Hundal, 2013). Hundal (2013), for example, finds that expertise and experience are crucial in determining whether auditing bodies in corporate organisations can adequately fulfil their duties and functions. In other instances, experience affects an individual's expertise. In a study conducted by Teichmann (2011), for example, individual experiences were shown to contribute to self-confidence and expertise in the delivery of particular products and procedures. Similarly, in McHugh and Lake's (2010) study, nurse expertise was significantly affected by the context of their organisations and the experiences of the nurses within these particular contexts. Accordingly to Ericsson et al. (1993), gaining expertise requires cognitive engagement, motivation, deliberate practice engagement, emotional intelligence, and diligence. Studies conducted by Stapleton, Wen, Starrett, and Kilburn (2007) and Priyadarshi and Kumar (2009) confirmed the existence of a relationship between work values and various age groups or cohorts. These researchers stated that work values change as employees' ages increase. Therefore, age should be a consideration when determining employees' expertise levels and appropriate motivation programs to increase retention.

The flip side of accumulated experience as highlighted in the expertise literature (Chi et al., 1988; Ericsson & Smith, 1991) shows that knowledge-sharing becomes more challenging as experience and expertise increase. Previously associated knowledge impinges on an individual's absorptive capability and power, making learning slower can be used to improve learning by shortening the learning curve. Thus, it is important to introduce the appropriate learning approaches early in order to improve learning by shortening the learning curve. Furthermore, tapping into the absorptive capacity of individuals may not only allow organisations to experience employees who will stay engaged, but also elevate their creativity (Seo, Chae, & Lee, 2015).

2.3 Contributions of Expert Knowledge in Organisations

The aim of this section is to demonstrate the significance of expert knowledge within an organisational setting. An organisation forms its identity based on business purpose and human capabilities that interact with the changing environment. This identity is developed through knowledge (Lam, 2000; Barney, Ketchen, & Wright, 2011; Fiol & Romanelli, 2012). Knowledge in organisations is viewed strategically as capabilities (Spender & Grant, 1996; Argote & Ingram, 2000) and resources (Itami, 1987). More recent arguments by Felin, Foss, Heimeriks, and Maden (2012) refer to these capabilities and resources of individuals' as

'microfoundations' (p. 1352). Knowledge is derived from individuals' experience, deliberate practice, and insights. Moreover, the knowledge of those who have worked over time sustains a distinct organisational reputation. Individual and collective knowledge represents organisational knowledge. Knowledge in the organisation can be collectively described as 'work-oriented practice'.

2.3.1 Organisational Knowledge

Knowledge, when contributed and applied to an organisational contextual outcome, is termed 'organisational knowledge'. Researchers such as Crossnan, Lane, andWhite (1999), Alavi et al. (2006), Ericsson et al. (2006), Bennet and Bennet (2007), and Ribeiro and Ferreira (2010) define organisational knowledge as an individual's knowledge and actions. This knowledge is shaped by domain-specific knowledge, experience, understanding of practices, management processes, skills acquired through experience, and learning within the organisational context. Argote and Ingram (2000) state that organisational knowledge is a compound of an individual's competency and the capability that the individual demonstrates in their daily routines. According to Argote and Ingram (2000), organisational knowledge may result in innovations, thereby contributing to the organisation's successful performance.

Organisational knowledge is the attainment of a relationship between an individual's knowledge and an organisation's performance needs (Tsoukas and Vladimirou, 2001). Davenport and Prusak (1998) refer to this link in the following way:

> Knowledge is a fluid mix of framed experiences, 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 the knowers. In organisations, it often becomes embedded not only in documents or repositories but also in organisational routines, processes, practices, and norms (p. 5).

The threat of losing critical knowledge stems from tacit knowledge, especially accumulated experience that builds on the social and organisational context of the organisation.

Knowledge in the context of organisational performance builds intellectual capital, which is necessary for producing wealth (Jashapara, 2004). Organisational knowledge has assumed the guise of an 'intellectual asset' (Stewart, 1997, 2003; Sullivan, 2000; Teece, 2002), 'strategic resource' (Penrose, 1985; Barney, 1986; 1991; Barney and Ouchi, 1986; Fiol, 1991), and 'organisational memory' (Hedberg, 1981; Abecker & Decker, 2000; Chosnek, 2008, 2010). These labels describe the importance of knowledge to organisations given the constant state of change and flux of the business environment. According to Rasula, Vuksic, and Stemberger

(2012), organisations must constantly update their practices and processes in order to keep up with rapid technology change. Moreover, organisations must be prepared for the departure of employees and experts at any time. Therefore, the process of organisational KM is of substantial concern, and KM practices can have a positive impact on overall organisational performance (Rasula et al., 2012).

Organisational KM models provide ideal opportunities to discuss the creation, sharing, and utilisation of knowledge in a structured way. Several distinct models conceptualise various key infrastructure elements of KM in organisations. For example, von Krogh and Roos' (1995) model of organisational epistemology addresses the fundamentals of how and why individuals and organisations become aware of the knowledge process. Choo's (1998) sense-making KM model draws on Weick's (2001) study of sense-making, and explains the process by which information eventually becomes organisational actions. This dissertation discusses the Nonaka and Takeuchi (1995) knowledge spiral model in detail because that model explains how experience, practices, and learning become valuable assets through the process of conversion for different types of knowledge. The following discussion expands on the SECI KM model. The fundamental aim was to try and conceptualise managing knowledge for retention, and to address knowledge loss through the SECI KM model.

2.3.2 The SECI Model

Nonaka and Takeuchi (1995) argue that the SECI model presents a particular process of institutionalising knowledge within an organisation. Nonaka and Takeuchi (1995) and Simon (1991) suggest that knowledge generated by individuals does not become institutionalised without collective sharing. An individual's knowledge is distributed within a group at a time and space where individuals interact and share their beliefs and embodied skills (Nonaka et al., 2000). Nonaka and Takeuchi (1995) describe this exchange of knowledge through their SECI model. The four key elements of the SECI model (Nonaka & Takeuchi, 1995) demonstrate how the model operates in an organisational context.

a) Socialisation: Creating a social space where individuals can share feelings, emotions, experiences, and perceptual models face-to-face.
b) Externalisation: Creating a space where tacit knowledge is transferred and documented in explicit form. Two key ways knowledge is explicit are through dialogue and metaphor creation via reflective peer-to-peer communication.
c) Combination: Creating a virtual space, where information technology facilitates the recombination of existing explicit knowledge to form new explicit knowledge through systemic collaboration between the organisation and teams.

d) Internalisation: Creating a space where explicit knowledge is converted into tacit knowledge through the sharing of knowledge among individuals, teams, and the organisation.

e) 'Ba': This is a concept which Nonaka and Toyama (2002) describe as dialectic process where knowledge is created through deduction, induction, creativity, and efficiency exercised by the individual. This knowledge synthesising and interaction process has been drawn from Vygotsky's (1986) seminal work, and it is not free from the individual's social, cultural and historical contexts. In essence, 'Ba' refers to an individual's autonomous sense-making creation with no organisational restraints.

The above discussions of the SECI model show that socialisation allows for the creation of new tacit knowledge from old tacit knowledge through social engagement. While tacit knowledge is difficult to capture, tacit knowledge that is expressed and diffused can be a tool to create competitive advantage (Kalkan, 2008; Mayfield, 2010). Hall (2006) has supported the notion that tacit knowledge is a tool to create competitive advantage, arguing that knowledge can be transferred through the socialisation and transformation of tacit knowledge into explicit knowledge. During the externalisation process, new tacit knowledge becomes explicit knowledge — embedded into documents or retrieval artefacts. This explicit knowledge is integrated with previously learned explicit knowledge to create new forms of explicit knowledge in a process called combination. This new explicit knowledge becomes tacit knowledge through the internalisation process. In this way, the transformation of knowledge is an iterative process with socialisation at its heart.

Herder et al. (2003) and Hari et al. (2005) recognise that, at the individual level, the knowledge-sharing of experiences is conducted socially where there is interaction between team and group members. Organisational knowledge emerges when individuals start to share personal knowledge, when knowledge is integrated in groups, when other members adopt the knowledge, and when knowledge is transferred, diffused, and transitioned (Koh, Gunasekaran, Thomas, & Arunachalam, 2005: Lustri, Miura, & Takahashi, 2007). When this occurs, an organisation inherits knowledge. Leon et al. (2012) contend that knowledge is managed, shared, learned, and transformed in the organisational setting through this iterative process, which essentially becomes organisational culture. The review of this model highlights the important cyclic knowledge transfer and sharing that occurs and is required in organisations. This model displays the importance of tacit exchange and knowledge creation. The model explains the epistemological dimension of knowledge between individuals and groups in an organisation. The model also relates to the value system of the organisation (Bratianu & Orzea, 2012).

The following discussions establish the meaning of sustained competitive performance in the knowledge-based economy and outline two main theories: peak performance and the resource-based view (RBV), which explains the intangible value contribution of expert knowledge.

2.3.3 Sustainability for Performance

The significance of knowledge for sustainable organisational performance lacks a comprehensive link to expert knowledge in the literature. In the 21st century's knowledge-based economy, knowledge is viewed as both a capability and a resource that drives an organisation's innovation (Penrose, 1985; Barney, 1986 and 1991; Barney & Ouchi, 1986; Fiol, 1991; Drucker, 1993; 2003; DeNisi, Hitt, & Jackson, 2003; Al-Hawamdeh, 2003; Isaai & Ali, 2006). The departure of experts in a steady flow is, therefore, of critical concern because organisations have little or no time to fill the knowledge gap. Peteraf (1993) and Augier and Teece (2005) add that expert knowledge may be an organisation's competitive advantage over other organisations in that it leads to a higher level of performance.

The literature uses different labels to describe individuals who contribute to an organisation's competitive performance. Barney (1986) and DeNisi et al. (2003), for example, refer to these individuals as 'knowledge-based resources' (p. 6), whereas Augier and Teece (2005) and Marr (2005) refer to the use of these workers' 'intellectual capital'. Although the labels may differ, there is widespread agreement that knowledge refers to the use of the individual's skills, abilities, decision-making, use of know-how, and learning based on experience. Knowledge and individual peak performance that contribute to competitive business outcomes thus become organisational resources. Such resources, however, are considered expensive because the nature of knowledge is difficult to develop at the individual level and even more difficult to integrate at the organisational level. DeNisi et al. (2003) argue that a high level of mobility in knowledge-based individuals can increase the likelihood that a competitor may (through poaching, head-hunting and other strategies) leverage this knowledge, cause knowledge loss, and eradicate an organisation's ability to compete in the marketplace.

Studies by Wernerfelt (1984), Barney (1991), Grant (1996), and Leavitt (1996) imply that intellectual knowledge is an enabler and a central source of innovation, and provides organisations with a competitive advantage. Intellectual knowledge is contributed by individuals who exude competency in deploying their knowledge through sense-making of external drivers and needs and deploying their knowledge individually and collectively (Nonaka & Takeuchi, 1995; Teece, 2003; McDonough, Zack, Lin, & Berdrow, 2008).

2.3.4 Peak Performance

Various studies on peak performance in the leadership and organisational fields have concluded that peak performance is more efficient, creative, productive, or in some way better than ordinary behaviour' for specified tasks (House, 1977; Burns, 1978; Privette, 1983, pp. 323-324; Bass, 1985; Leavitt, 1996; Kirkman & Rosen, 1999). Peak performance can be depicted in terms of timelessness (Mainemelis, 2001), flow (Csikszentmihalyi, 1990) and aesthetic experience (Sandelands & Buckner, 1989). 'Timelessness' describes how individuals at work are engrossed in activities that they are attracted to, and that can promote creativity. 'Flow' describes how individuals create an inner harmony and continue learning to sense optimal experience in their individual efforts and creativity. Aesthetic experience is unique for each individual, because it focuses on pleasure obtained from their involvement in work.

In the context of organisational performance, Garfield (1987), Ericsson et al. (1993), Hamel and Prahalad (1993), and Gilson, Practt, Roberts and Weymes (2000) concur that workforce skills must be sustained and developed at high levels of organisational fitness and human skills development by generating new knowledge from past experiences. This is achieved when leaders capitalise on the skills and competencies of the workforce and embrace peak experiences. Penrose (1959) and Henderson (1994) have asserted that resources, peak performance, and experience are organisational capabilities that are central to an organisation's competitive performance.

2.3.5 The Resource-Based View

From an organisational perspective, the resource-based view (RBV) (Penrose, 1959; Wernerfelt, 1984; Barney, 1991) suggests that knowledge is valuable, rare, inimitable, and sustainable. Further works about RBV focus on human capital and organisational capital as resources and the construct of knowledge, expertise, and management routines as factors that link knowledge as a resource (Wernerfelt, 1984, Barney, 1991; Grant, 1996). Grant (1996), and Grant and Baden-Fuller (2004) argue that knowledge is created and resides in individuals focused on the boundaries of the organisation's business and is important in the coordination of innovation. More recent literature by Teece (2003), Grant and Baden-Fuller (2004), and Darroch (2005), writing within the RBV perspective, extends the role of knowledge by stating that 'the competitive advantage of firms in today's economy stems not from market position, but from difficulty in replicating knowledge assets and the manner in which they are deployed' (Darroch, 2005, p. 10).

The literature on organisational performance shows that knowledge and the utilisation of knowledge emerge as significant organisational assets, particularly when using innovation as a business strategy to achieve competitive advantage in the global market. To explain experts' knowledge contribution and significance to organisations, we review organisational culture and commitment towards learning.

2.4 KM and Support in Organisations

The literature on learning and types of organisational knowledge for transfer is integrated in this dissertation to help us understand the core areas of learning for knowledge transfer as part of organisational culture: experiential learning, cultural knowledge, and cultural intelligence. This literature shows that for the deliberate practice and accumulation of experience, learning is a key feature of knowledge. KM studies show that the legacy of knowledge is conceptualised as 'true belief' (Plato, 1987, 201c-d), knowledge is a cognitive hybrid, and knowledge is justified by experience (Williamson, 2000). In addition to understanding expert knowledge, it is also important to appreciate how knowledge is acquired, transmitted or lost. Studies by Garvin (1993) and Joo (2009) have pointed to the lack of research in this area.

2.4.1 Learning in Knowledge Transfer and Managing Knowledge

Learning is one method of knowledge transfer. Learning can be viewed at two levels. First, learning occurs at the individual level. Second, learning occurs at the organisational level, where knowledge valuable to the organisation is nurtured. McKenzie and van Winkelen's (2004) KM framework defines learning as knowledge development with the intention of refining domain-specific knowledge and absorbing a culture of practice bringing cognitive and behavioural change to performance. Organisational learning literature has recognised as successful reformation of organisational difficulties, as well as the development of insights. Chandler (1962), Simon (1969), Duncan (1974), Miles and Snow (1978), Jelinek (1979), Miller and Friesen (1980), Shrivastava (1981), and Fiol and Lyles (1985) acknowledge that previous studies attempted to define organisational learning. No definition of organisational learning is widely accepted, however, particularly with respect to strategic performance. Collinson and Cook's (2007) definition of organisational learning 'as the deliberate use of individual, group, and system learning to embed new thinking and practices that continuously renew and transform the organisation in ways that support shared aims' (p. 8) is consistent with the understanding used in this dissertation. Argote (2013) describes organisational learning as learning that occurs when the dimensions of an external environment affect the experience acquired in the organisation, and the changing context interacts with the experience to create learning, propelling the organisation toward sustainable performance.

According to Fiol and Lyles (1985) and Argote (2013), learning involves a change in the state of knowledge and organisational outcomes. Learning is described as new knowledge (Argyris & Schon, 1978; Hedberg 1981), new structures (Chandler, 1962), new systems (Jelinek, 1979; Miles, 1982), actions (Cyert & March, 1963; Miller & Friesen, 1980), or a combination of all of these approaches to address tasks and challenges (Shrivastava & Mitroff, 1983; Bartunek, 1984; Shrivastava, & Schneider, 1984; Sunassee & Haumant, 2004) that occur in context (Glynn, Lant & Miliken, 1994). An organisation's strategy influences learning by providing a context for the perception and interpretation of the environment and boundaries for decision-making (Chandler, 1962; Cyert & March, 1963; Daft & Weick, 1984). Within the organisation, strategic decisions serve as a function of learning capacity (Burgelman, 1983) and establish the momentum for organisational learning (Miller & Friesen, 1980).

The organisation's structure has the potential to affect learning outcomes. For example, centralised, mechanistic structures support past behaviours and preservation of the *status-quo* while a more decentralised structure facilitates shifts in beliefs and actions. Centralised functional organisations may be efficient but are less likely to adapt (Starbuck, Greve, & Hedberg, 1978; Vancil, 1978; Hrebiniak & Joyce, 1984). A decentralised structure decreases the cognitive workload of individuals, which allows the integration of new patterns and associations by reducing information demands (Galbraith, 1973). Meyer (1982) suggests that 'formalised and complex structures retard learning but that learning is enhanced by structures that diffuse decision influence' (p. 533). For these reasons, some authors have argued that organisations should encourage learning and reflective action (Morgan & Ramirez, 1983).

When the internal or external environment is too complex and dynamic for the organisation, information and knowledge overload may occur, and these can impede learning (Lawrence & Dyer, 1983; Bartol & Srivastava, 2002; Lin, 2007a). Learning in an organisation involves the construction and management of tension between status quo and change. Thus, a certain amount of stress is required if learning is to occur (Cangelosi and Dill, 1965; Starbuck et al., 1978). The amount of stress and the extent of past successes determine the efficiency of the conditions of learning, which affects how the environment is interpreted by each and every employee (Starbuck et al., 1978; Weick, 1979; Daft and Weick, 1984).

Recognising knowledge, but not acknowledging how it is applied in an organisation, is not sufficient for a sustainable KM program. Thus, a learning organisation must leverage the contribution of individuals through knowledge sharing and transfer. The critical features of KM in organisations are discussed in the following section.

2.4.2 Sharing and Transfer

Ackerman's (1994) field studies, grounded in social psychology and organisational behaviour, have highlighted the significance of expertise for KM theory. The weakness in the KM literature, however, is a lack of clarity concerning knowledge transfer and knowledge sharing as well as the interchangeable use of transfer and sharing without clear grounding.

According to Davenport and Prusak (1998), knowledge transfer 'involves both the transmission of information to a recipient and absorption and transformation by that person or group' (p. 101). Argote and Ingram (2000) define knowledge transfer as 'the process through which one unit (e.g., group, department, or division) is affected by the experience of another' (p. 151). Knowledge transfer may be achieved through collective problem-solving and decision-making (DeLong & Fahey, 2000; Muscatello, 2003; Kaner & Karni, 2004). This method of organisational knowledge-sharing can reduce the time required to solve problems and may decrease the likelihood of repeated mistakes (Lin et al., 2006).

Knowledge sharing can be explained by Nahapiet and Ghoshal's (1998) view of social capital as knowledge that is accumulated in an organisation. Social capital has three dimensions: relational (trust), structural (communication systems), and cognitive (cultural beliefs). This is consistent with Salisbury's (2003) work on the knowledge-sharing process. Within the process, when the individual is in control of the knowledge to be shared, they into that knowledge source, identify the knowledge sharing target, and, finally, select a knowledge-sharing method. Hislop (2003) and Lee et al. (2006) add that knowledge sharing could be the result of employees' motivations and a high level of commitment to the organisation.

Wasko and Faraj (2005) have studied knowledge contributors and knowledge seekers, and argue that both interact, but with no assurance of whether they contribute as required. Thus, the contributor risks losing their unique knowledge (Thibaut & Kelly, 1959; Thorn & Connolly 1987). The literature also identifies barriers to knowledge-sharing and transfer. The notion of 'sticky' knowledge, or knowledge that is difficult to pass on, summarises many of the challenges that are associated with the transfer and sharing of knowledge (von Hippel, 1994; Szulanski, 1996; Von Brown & Duguid, 2001; Orlikowski, 2002). Different explanations account for reasons why knowledge becomes 'sticky'. For example, an unwillingness to share knowledge (Christensen, 2007); limitations to the recipient's absorptive capacity (Szulanski, 1996) and lack of trust and commitment between the source and recipient in the knowledge transfer process also affect the 'stickiness' of knowledge (Prusak & Fahey, 1998). Grayson and O'Dell (1998) discuss inappropriate and uncommunicative organisational structures that potentially contribute to knowledge stickiness. Structures in which locations, divisions, and

functions are too focused on maximising their own accomplishments and rewards tend to hoard information and knowledge, thus jeopardising the performance of the organisation as a whole. Park, Kim and Sung (2014) and Pfeffer (1981 and 1992) contend that expert knowledge is a fundamental organisational power source, and there will be resistance by parties if threatened with loss of power.

March and Olsen (1975), Argyris and Schon (1978), Duncan and Weiss (1979), Fiol and Lyles (1985), and Levitt and March (1988) define organisational learning as a process of change that models experiential learning influenced by culture and systems. The change process results in action linking the individual and the organisation.

While individual learning is relevant to organisations, organisational learning involves the totality of an individual's learning. Unlike individuals, organisations develop and maintain learning systems that are conveyed to other members through the organisation's history and norms (Mitroff & Kilmann, 1976; Martin, 1982; Lawrence & Dyer, 1983; Argote, 2013). Learning allows organisations to establish organisational understanding and interpretation of their environment and to evaluate strategies that result in associations, cognitive systems, and memories developed and shared by members of the organisation (Starbuck et al., 1978; Donaldson & Lorsch, 1983; Daft & Weick, 1984).

The following sub-sections summarise the core areas of learning for the transfer of knowledge as organisational culture: experiential learning, cultural knowledge, and cultural intelligence.

2.4.3 Experiential Learning

Theoretical understanding of an individual's learning stems from the influential works of Piaget (1929 and 1960), who states that thought and reasoning lead to learning. Saddington (1992) and Moon (2004) describe experiential learning as a process of acquiring concepts from experiences to generate a new learning experience. The authors posit that experiential learning serves as a guide for learners in translating a new learning concept. Green (1995) and Moon (2004) contend that experiential learning can be structured and sequenced to increase the effectiveness of the learning experience.

Experiential learning can be studied from several perspectives. From the cognitive perspective, the accumulation of prior knowledge enhances the intellectual capacity of individuals for memorising new knowledge and performing in their practice (Cohen & Levinthal, 1990). Specifically, learning and experience increase the ability of individuals to interpret information and to expertly select the information that can facilitate decision-making (Alavi & Leidner, 2001). Relevant prior knowledge assists in internalising, processing, and reflecting to gain

further learning (Kwok & Gao, 2005). Research shows that individuals without relevant experience usually find new knowledge difficult or even impossible to interpret given that the interpretation requires related prior knowledge (Kuhlthau, 1993; Beveren, 2002).

Extensive studies have been conducted in the cognitive science fields concerning these aspects of knowledge. Studies in cognitive science show that individuals inherit their environment (Ehrlich et al., 2003; Warneken & Tomasello, 2006). Expert knowledge is the focus of this dissertation; therefore, inherited perspectives are presented to emphasise the knowledge gathered by individuals in situations and the framing of that knowledge within the mindset of the individual. The interpretation and transfer of workplace and cultural knowledge allows a deeper understanding of experts' knowledge contribution and potential knowledge loss for organisations.

2.4.4 Expert Knowledge Repository

Expert knowledge repositories encourage the collection, storage, and distribution of structured knowledge forms. Liebowitz and Beckman (1998) define a 'knowledge repository' as an

> online computer-based storehouse of expertise, knowledge, experience, and documentation about a particular domain of expertise. In creating a knowledge repository, knowledge is collected, summarised, and integrated across sources (p. 370).

This thesis draws on more recent studies on information systems and technology to show a link with the expert knowledge literature. It contextualising within the space where an individual exercises knowledge and skills and, together with the elements of intuitive knowledge capturing and codification, are important in the effective use of knowledge repositories, particularly for learning purposes (Garavan, O'Brien, & Murphy, 2014).

2.4.5 Cultural Knowledge

Sackman (1991) contributes to the technical framework of cultural knowledge from a cognitive perspective and describes culture as 'organised knowledge' (Sackman, 1991, p. 21). According to this perspective, knowledge is constructed by and inseparable from the individual. Knowledge is constructed in a system of activities and processes of knowing within the organisational context, and knowledge refers to accumulated knowledge, judgements, sense-making and frames of reference based on continued practice and learning. Sackman (1991) suggests four main types of cultural knowledge. These are: (1) recipe knowledge (knowing what to do, what not to do, and what should be done); (2) dictionary knowledge (knowing what to do

in certain circumstances, or what is termed 'execution') (p. 49); (3) directory knowledge (this is the 'how' of knowledge); and (4) axiomatic knowledge (knowing 'why').

Thus, cultural knowledge in an organisation develops when members possess cultural intelligence. The next section presents the link between cultural intelligence and organisational knowledge and culture.

2.4.6 Cultural Intelligence

Cultural intelligence can be defined as an individual's capacity to effectively operate and manage a culturally diverse environment (Ackerman & Humphreys, 1990; Ang et al., 2007; Livermore, 2011). Cultural intelligence also suggests the ability to skilfully recognise specific behaviours in a group and manage them (Tan, 2004; Brislin et al., 2006). The components of cultural intelligence, as stated by Ang et al. (2007) and Crowne (2013), include judgement ability, decision-making skills, cultural adaptation, and task performance. Individual cultural intelligence develops incrementally in five stages of evolution (Sawhney, Thomas, & Inkson, 2008), namely:

a) Normal stimuli-aspects or evaluating cultural background
b) Recognition factors or similarities between cultures
c) Adoption of cultural norms
d) Integration of diverse cultural norms
e) Proactivity in cultural behaviour

In summary, an individual's knowledge is highly dependent on the development of knowledge acquisition for success. The individual must be cognitively, physically, and emotionally or motivationally ready to learn and engage with the organisation. Cultural intelligence is essential in reflection and learning (Earley & Peterson, 2004; Crowne, 2013) and influences experiential learning (Ng et al., 2009).

2.4.7 Knowledge Retention

Scholars in the knowledge management field have also noted that knowledge is deemed to be the core element of institutional memory and an integral component of processes that drives sharing, transferring, and learning (Olivera, 2000; Argote, et al, 2003; Schmitt, Borzillo & Probst, 2011). Knowledge retention does not just focus on the transfer from tacit knowledge or explicit knowledge embodied in the knowledge management system. Knowledge retention also involves employees engaging collaboratively and gaining deeper insights to then learn and adapt to improve the organization's performance (Kannan & Madden-Hallet, 2006). Knowledge

retention thus encourages a complex discussion on what knowledge an organisation needs to retain. Scholars such as Cohen and Levinthal (1990), Madesen, et al. (2003), and Anderson and Sun (2010) have argued that the knowledge retained needs to be purposeful and enable categorisation and sense-making. As Schmitt et al. (2011) states: "The conservation of relevant knowledge on various organizational levels helps to create a context that enables collective knowledge processes and social integration mechanisms for absorptive capacity" (p.67).

2.5 Chapter Summary

This chapter has presented a comprehensive cross-disciplinary review of the literature about expert knowledge and the significance of knowledge contribution within an organisational context. The chapter has illustrated that there is a need for a study that shows how knowledge retention and loss can be conceptualised. The chapter has also shown that there is a need to move beyond the scientific and clinical understanding of experts and expertise, and examine at a more narrative level how the expert individual perceives they are contributing to an organisation; what they value as critical to be retained for learning and sharing within the organisation; and what could potentially be lost when the expert leaves the organisation.

The following chapter discusses the research methodology employed to conduct the research, and the ways in which the research questions will lead us to develop an appropriate KM conceptual model.

CHAPTER 3 – METHODOLOGY

3.1 Introduction

The aim of this chapter is to describe the research inquiry used in this dissertation. This chapter consists of two major sections. The first section provides the theoretical perspective (research paradigm) and discusses the relevance of the research questions. Given that this dissertation adopts a case study approach to investigate the key research questions, the benefits of this approach are also discussed. The second section details the methods of data collection and the strategies employed to analyse the data. Issues concerned with quality assurance in the data collection and interpretation are also addressed.

3.2 Research Paradigm

The research, in particular, seeks to identify the consequences of knowledge loss upon experts' departures from organisations. The intention was to capture experts' unique narratives and give voice to their experiences. To accomplish this, a qualitative approach was used as a means of providing rich interpretive data and information. Specifically, using case studies would facilitate an understanding of the relevant aspects of KM under review. Additionally, and as discussed in Chapter 2, the SECI KM Framework was employed as an organising framework for a deeper understanding on contribution of knowledge to expert's organisational culture, practices and routines. This chapter underpins the collection, interpretation and presentation of the eight case studies in Chapter 5 and the analytical findings in Chapter 6.

Filstead (1979) defines a paradigm as a 'set of interrelated assumptions about the social world which provides a philosophical and conceptual framework for the organized study of that world' (p. 34). The research paradigm exerts considerable influence in all aspects of a research project (Tadajewski, 2009). This paradigm shapes the types of research questions posed, as well as the research design, methods, and even the approach to sample selection.

According to Guba and Lincoln (1994), a number of paradigms can be identified, namely: positivist, post-positivist, critical theory, interpretivist or constructivist, and, more recently, participatory. Furthermore, an objective research focuses on the research object to understand reality, whilst subjectivism involves the researcher involved in the context of the situation to bring understanding. Research paradigms are the lens through which the researcher views the

epistemological, ontological and axiological dimensions of the study. An interpretivist framework was adopted for this study.

Epistemology relates to the development of socially constructed knowledge between the participant and the researcher (Guba & Lincoln, 1994; Saunders, Saunders, Lewis & Thornhill, 2011; Wahyuni, 2012). Epistemological assumptions underpinning an interpretivist paradigm are that knowledge can be examined inductively, knowledge is discovered through multiple sources, knowledge is based on personal and subjective experiences, and knowledge is complex and not simplistic (Neuman, 2006). Ontology relates to how reality is perceived and dependent on the social actor's perception, influenced by their social context (Guba & Lincoln, 2005; Ponterotto, 2005; Hallebone & Priest, 2009; Wahyuni, 2012). The ontological assumptions underpinning an interpretivist approach are that reality is subjective, different individuals have different interpretations of reality, generalizations cannot be made, and causation is based on the interpretation of meaning (Creswell, 2009). Axiology in research refers to the role and place of the researcher's voice, values, and ethics, and maintains the voice of participants (Guba & Lincoln, 1994; Ponterotto, 2005). These concepts guide the study undertaken in this dissertation.

3.2.1 Research Pyramid: Linear and Iterative Process

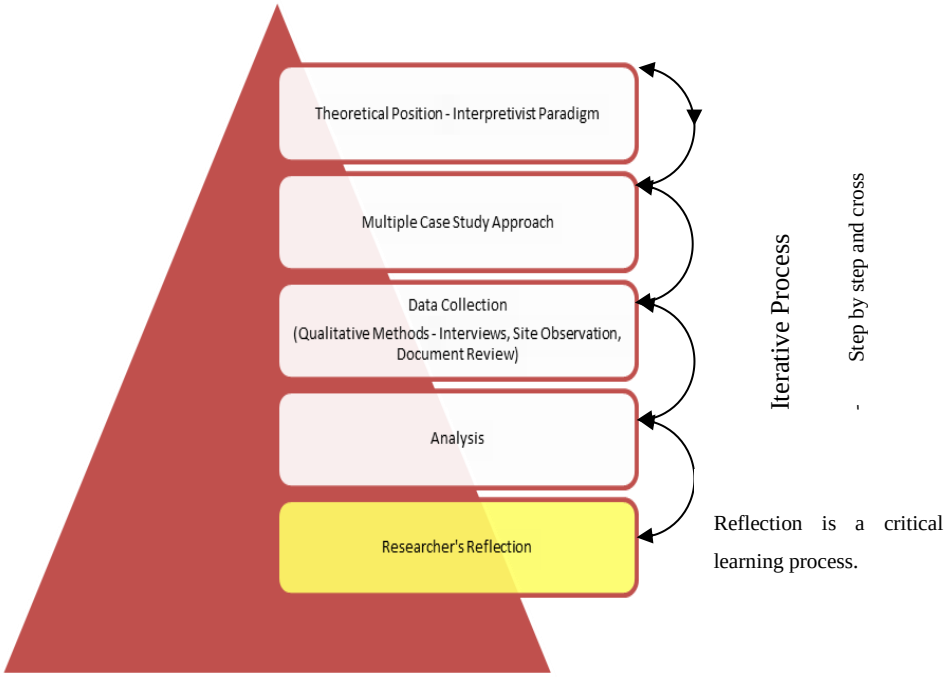
The overall research framework for the current study was an applied and modified version of Jonker and Pennink's (2010) Research Pyramid, which consists of four interconnected levels of the research process. Jonker and Pennink's original framework ensures that researchers make clear decisions in four key areas: theoretical position, research methodology, research methods, and research techniques. The process is both linear and iterative since it ensures that researchers are always mindful of the way that their theoretical stance influences every aspect of the research design.

Given that the current study uses an interpretivist paradigm in which the researcher's worldview forms a major part of the research inquiry, the researcher added a fifth step to Jonker and Pennink's (2010), so that the researcher's reflections become a discrete step in the research process. By structuring reflection in research, this can assist a researcher in controlled thinking on the actions that a researcher takes on the study. Reflection as a process tool can help engage in reconceptualising the significance of the study. Research journals are a good way of keeping these reflections. For the purpose of this dissertation, the researcher maintained research journals on the learning acquired throughout the process. The researcher's reflection can be viewed in Appendix 1.

The applied and expanded Research pyramid is illustrated in Figure 1 and summarised here:

a) The research paradigm – Theoretical Position: Interpretivist paradigm
b) The research methodology – Case study approach
c) The research methods – Qualitative data collection (e.g. depth interviews, observation, document review)
d) The research techniques – Thematic Analysis
e) Researcher's reflection (This level was added by the researcher as an important level contributing to learning.)

Figure 1: Research Pyramid - A Linear and Iterative Process



Source: Adapted from Jonker and Pennink, 2010, p. 23

3.2.2 An Interpretivist Paradigm

Taking Myers (2009) premise that interpretivist paradigm is the access to reality, the researcher confirms that to access reality of the experts a subjective orientation needs to be taken to understanding the expert's subjective knowledge experience at work. The main tenet of the intepretivist paradigm is that truth cannot be examined objectively, without examining the experiences of people who embody the phenomena being studied (Green, 2002). Interpretivism 'sees people, and their interpretations, perceptions, meanings and understandings, as the primary data source' (Mason, 2002, p. 56). Researchers who adopt an interpretivist paradigm

focus on understanding a social reality from the perspectives of different individuals (Cohen et al., 2007). Green (2002) asserts that an 'interpretivist position assumes relativist ontology (view of reality or 'truth') where reality is viewed in terms of multiple constructions' (p. 6). Using this interpretive position allows for an understanding of the multiple interpretations of experiences, memories and 'realities' influenced by contextual situations (Hatch & Cunliffe, 2012). The case studies of the experts presented in Chapter 5 demonstrate that there is no single perception of 'reality'.

Given that this dissertation seeks to unfold the 'reality' of the experts' perceptions of knowledge contribution and potential loss upon their departure from an organisation, an interpretivist position is appropriate. This approach enables participants to voice their subjective 'reality' and how the experts, themselves, perceive their knowledge contribution being of value to the organisation. Human experiences and actions viewed through the eyes of the interpretivist social science researcher capture (a) the occurring physical events and behaviours; (b) the manner in which the participants make sense of these events and behaviours; and (c) the manner in which the understanding of participants influences their behaviours (Denzin & Lincoln, 2003b). The interpretivist paradigm helped deconstruct the perceptions through analysis of the social realities identified in each expert's meanings, knowledge and experiences. Subscribing to the interpretivist paradigm largely determined the selection of the methodology and methods employed in the study.

Qualitative methods and the use of the interpretivist paradigm elicit understanding of phenomena through analyses of the meanings of texts and actions gathered and observed by the researcher (Flick, Kvale, & Angrosino, 2007; Greene, 2007). The dynamic nature of the method allows complex forms of inquiry in this dissertation to help gain insights of the experts' perspectives. The research involves human actions, thinking and involvement in continuous interaction with organisational culture, practices and routines. A multifaceted level of study is gained from qualitative methods that provide rich data and information. In essence in this study qualitative method attempts to capture life as it is lived.

The following sections present the relevance of the research question to the interpretivist paradigm before discussing the case study approach and design, and demonstrating how the method contributes to achieving the aims of the dissertation's key research questions.

3.2.3 Research Question

The key research question was framed so as to understand the 'reality' of issues faced in organisations in relation to departing experts and knowledge loss. Organisations consist of

people and their subjective 'realities' and 'problematizing' the reality (Jonker & Pennink, 2010, p.3). Jonker and Pennik's (2010) view on problematizing is:

> This phenomenon (how things appear to people and how people experience the world) is called problematising [therefore] is not a solely a rational process based on 'facts' but a lively mixture of what people have in their minds and hearts and leads to a biased and fragmented interpretation of the world (p. 6).

The ageing workforce creates the likelihood of impending knowledge loss, and this is a problem for organisations. The key research question in this dissertation helps (from an organisational context) to gain perspectives of knowledge loss from departing experts. The questions assist in contributing to the KM theory of the SECI framework. From the findings in this dissertation, the issues identified may provide insights and solutions to other organisations.

The key research question is: 'How do Gothamfield's expert employees perceive their knowledge contribution to this organisation, and how (following their departure) will the loss of this knowledge affect the organisation?' The research sub-questions are as follows:

1. What do their knowledge, skills, and experiences mean to the experts?
2. What is the experts' understanding of how others in the organisation perceive their knowledge contribution?
3. How do the experts perceive the prospect of the loss of their knowledge when they leave the organisation?

The sub-questions are all specifically designed to draw further on the experts' perspectives and gain a deeper understanding of experts and their perceived contributions of domain-specific knowledge associated with contextual organisation-specific knowledge. Both of these types of knowledge (domain and contextual knowledge) are strongly related to an individual's contribution toward the business performance of an organisation.

The first sub-question aims to elicit information about what knowledge and skills that the experts contribute. This question is designed to provide experts with the opportunity to reflect deeply on their personal knowledge and skills. Furthermore, this question aims to explore interviewees' understandings of significant contributions of domain-specific knowledge associated with contextual organisation-specific knowledge.

The second sub-question has been designed to examine experts' perspectives on how others valued their knowledge. This question enabled the experts to reflect on the connections, areas of contribution and events that they perceived to be valuable within the organisation.

The third and final sub-question is designed to elicit experts' perspectives on the potential impact for the organisation upon their departure. The depth interviews involved asking participants to share a success story that they believed would inspire future generations. This sub-question sought to facilitate reflection on the expert's self-perception of knowledge contribution, for example, beliefs about what they value and what the organisation equally values.

In summary, the questions pressed the experts to examine the problem of knowledge contribution and loss, and problematizing it in their roles. Each question explored the participants' perspectives of knowledge contribution. The framing of the research questions was consistent with an interpretivist tradition, in that they were designed to gain insights into each expert's work 'reality' and are central to the case study approach.

3.3 Use of Case Studies

The literature identifies three distinct types of case study: intrinsic, instrumental, and collective (Yin, 1981; Romano, 1988; Eisenhardt, 1989; Stake, 1995). Grandy (2010) describes an intrinsic case study as one that explores the uniqueness of the focal subject. As such, an intrinsic case design was used in this dissertation. Participants in the case analysis were expert engineers, managers and novices. An intrinsic case study methodology allows the researcher to share the learning of the richness and complexity of the case determined by the expert's experience and stories to allow the understanding of peculiarities which is essential in the research domain of knowledge in a real-life organisational context. The case study approach allows the exploration and explanation of each individual expert's perspective in narrative form within context and allows the reader to gain a deep contextual understanding on the perspectives of knowledge loss from each expert.

Case studies are a well-established qualitative research method, allowing a phenomenon to be studied in its natural social setting. Using case studies can help us to understand complex issues surrounding organisations, individuals and other complex relationships by using various sources of confirmation (Yin, 2003; Hancock & Algozzine, 2006). De Weerd-Nederhof (2001) argues that when the research aim relates to the 'what' and 'how' type answers, case studies are more appropriate. Yin (1984) posits that the case study approach is an

> empirical inquiry that investigates a contemporary phenomenon within its real-life context; when the boundaries between the phenomenon and context are not clearly evident; and in which multiple sources of evidence are used (p. 23).

The dissertation aims to provide insights into the uniqueness of experts' knowledge contribution through their information-rich stories, which are gleaned through case studies. Case studies tend to capture the meanings. As Green (2002) notes:

> Case studies are useful mechanisms for highlighting meaning from the viewpoint of the individual. They provide a window of meaning on the lives of the researched, a means by which to examine multiple realities … the case study provides the soul of the research (p. 14).

Apart from providing useful insights, case studies allow for 'naturalistic generalisation'. This is an intuitive process, then exercised by the reader, who recognises the case similarities that resonate with their own experiences from their tacit interpretation (Stake, 1980a, p. 69; Kemmis, 2012). Heidegger (1996) has suggested that the phenomenon of knowledge, skills and expertise loss can be framed only through empirical examination. This research focused on studying the experts in the organisation, as most of these experts had been with the organisation for no less than 15 years. This purposeful sampling of experts provides a distinct rationale for the selection of the participants and at the same time addresses the research question. This can be explained further by Storkerson's (2010) argument that naturalistic thinking involves tacit knowing, experience and intuitive reasoning. Thus, when a researcher takes a subject matter as their focus, they can integrate their scientific knowledge and cognition with the reality faced by the experts and their work experience. In doing this, the researcher discovers the intuitive process, that is, how people's personal experiences can help them make sense of complex issues. Also this thinking when combined with generalisations that occur from recognising patterns and behaviours allows the reader to apply this naturalistic thinking. Thus the case studies taking this approach will resonate with the readers because they will be able to apply their experience-based knowledge using the stories shared by the experts to relate it to the experts' real time contextual situation and make that formal interpretation through this intuitive process. As Baumeister and Newman (1995) state "People will nearly always make sense of their experiences by constructing them in a story form, and sometimes (but not always) they will proceed from these stories to infer or deduce generalisations" (p.98)

The key advantage of using case studies is that they provide the audience with context and insight into tacit knowledge where humans are the instrument (Green, 2002). That is suitable for the present dissertation, where the research aim is to explore the 'how' and 'what' of knowledge loss with the departure of experts from an organisation. Case studies are appropriate for understanding contemporary events (Rowley, 2002). Another advantage of using case studies is that they can help provide a rich description of the experts' portfolio of knowledge before they depart the organisation, thereby ensuring that this valuable resource is recognized and retained.

Some journalists, for example, are well aware of the ways that society and business tend to overlook the value of soft assets. An article that appeared in *The Sydney Morning Herald* (a prominent Australian newspaper) noted that 'Australia does not value human capital' (Cai, 2013, p. 6).

Heidegger (1996) has suggested that the phenomenon of knowledge, skills and expertise loss can be framed only through empirical examination. Such empirical investigations will help organisations strategise as they rely on the intangible knowledge, skills and expertise for their ongoing business performance. Rich data not only aids in drawing commonality, it also aids in surfacing unique information that assists in the analysis. It is not unusual for a researcher conducting a case study to use interviews, observations, document analyses and surveys, within the same study, in order to obtain multiple perspectives. Accordingly, in this dissertation, interviews, site observations and document analyses (where provided) were conducted as a part of the case study.

In summary, case studies have been accepted methods of inquiry used in organisational studies as it can provide diverse viewpoints in the natural setting (Hamel & Prahalad, 1993; Yin, 1994; Stake, 1995). The case studies, in this study, enable the construction of meaning gathered from the detailed perspective stories of the experts**.**

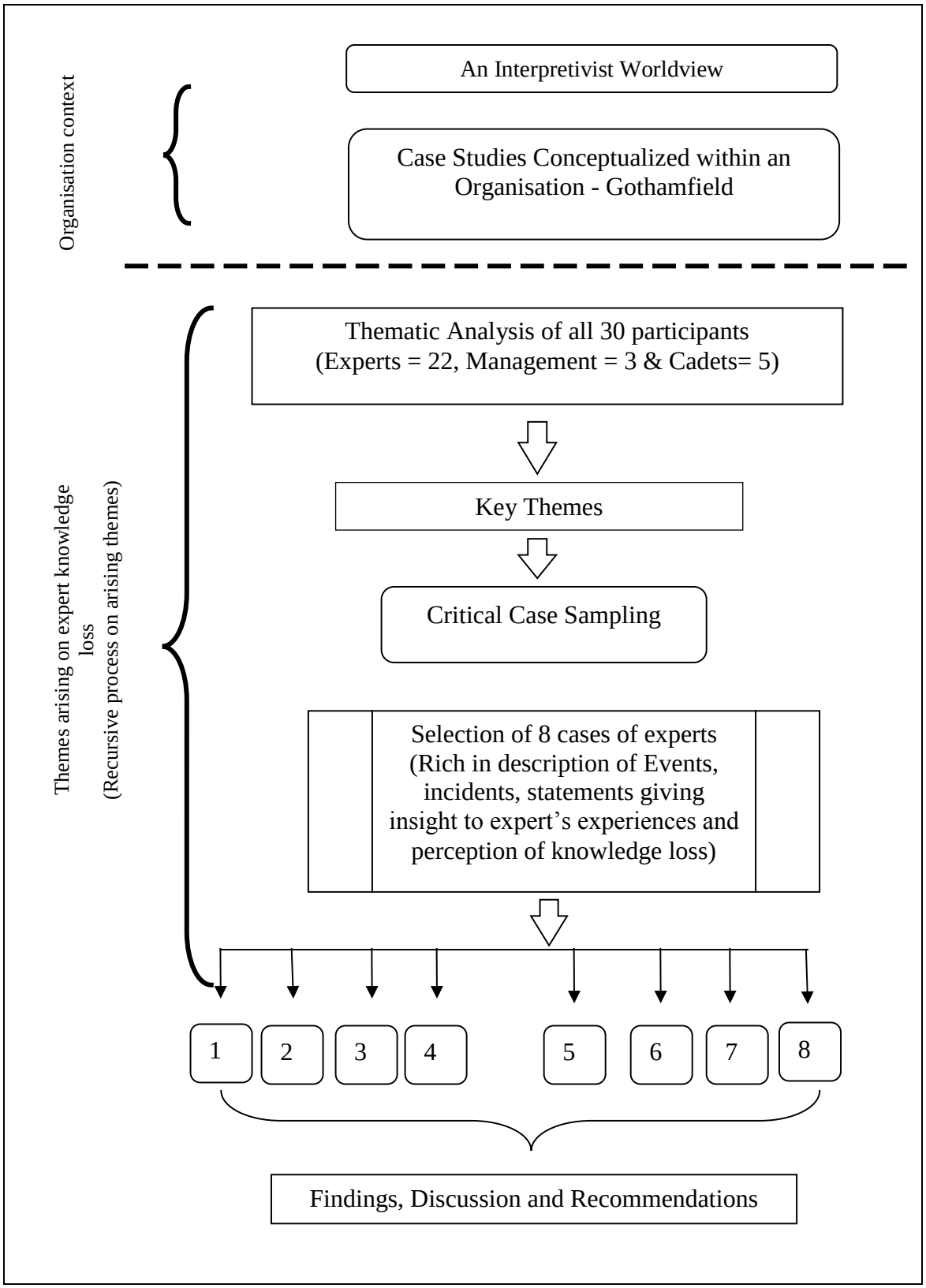
3.3.1 Case Study Design

With respect to organisational case studies, the units of analysis can be single or multiple organisations, people, processes or events (Collis & Hussey, 2003). For the purpose of this dissertation, the individual case was the unit because the experts' knowledge portfolio as a unit of analysis was of interest. The case study design draws on Yin's (2003, 2009, and 2014) conditions on the rationale of holistic case study design, where a logical approach on ensuring that the critical conditions are addressed in the dissertation. A critical process in case study design is to ensure the design clarifies the research question. The next step is to ensure that the data gathered and analysed provides insight and helps understand the case (Yin, 2003). In this dissertation, each expert is studied on their knowledge contributions. Thus gathering data on their knowledge contribution in the organisation enables the analysis of what knowledge may potentially be lost when they depart. Figure 2 shows a concept diagram of the case study approach design used in this dissertation.

A key decision in the research design involved deciding how many cases to use. Yin (2009 and 2014) suggests that eight cases constitute a sufficient number of replications to provide convincing explanations of a phenomenon. The key reason for writing up eight cases was to

enable a deeper appreciative understanding of the critical perspectives presented by the experts and to illuminate the phenomenon of knowledge contribution and loss. Other authors, however, suggest that a higher number of cases provide greater richness of data (Flyvbjerg, 2006; Easton, 2010). Accordingly, the current research adopted a compromise position in that 30 depth interviews were conducted and coded for the thematic analysis. Of these, though, only eight cases were selected for richer, more detailed analysis and inclusion in Chapter 5.

Figure 2: Case Study Design



The case studies consist of expert engineers who belong to the age cohort of 45–65 years, senior managers and cadet engineers. These three groups maximize the diversity relevant to the research question. The section below discusses the conditions to maximize the quality of the case study design.

3.3.2 Quality Assurance

Ethical principles and commitments such as authenticity and trustworthiness are crucial to quality assurance. Ethical considerations are duty-based obligations that a researcher must follow as a part of human responsibility in a society. Simons and Usher (2000) developed the notion of 'situated ethics' (p. 1). They explain that ethics are localized and specific to practice and it is the commitment of the researcher to 'understand that subjectivities and moral voices are constituted from their distinctive social, cultural and historical settings' (p. 4). Each research situation involves moral reasoning, which is developed within particular research practices (Simons & Usher, 2000). As a first step in addressing ethical principles, it was necessary to gain consent from the University ethics committee.

Swinburne Human Resource Ethics Committee: Prior to conducting the study, the researcher submitted an application for the approval of projects involving human participants to the Faculty of Business Human Research Ethics Committee at Swinburne University of Technology. The application addressed the issues of participant privacy and confidentiality, honesty, trust, and potential risks associated with the project. The ethics application was approved on 19 July 2010 (SUHREC Project 2010/125) for the period spanning 19/07/2010 to 31/08/2011. A copy of the Ethics Approval is attached in Appendix 2.

Another major ethical consideration was participants' privacy. Maintaining privacy through anonymity was particularly critical in building the participants' confidence and trust. Rather than assigning them a numerical code, participants were given pseudonyms. This helped remind the researcher that the participants were real human beings with feelings and emotions, while at the same time preserving their anonymity.

Gaining and Maintaining Access: Despite the researcher's strong networks in the mining industry, it took almost one year to find a willing industry partner for the project. Most organisations wanted to keep their workforce issues (for example, high retirement and low retention rates) confidential. To gain access, the researcher first targeted large organisations identified from the *Australian Workforce and Productivity Agency – Future Focus Report* (March, 2013). The researcher identified the mining industry as a critical contributor to the Australian economy. This industry demonstrated the highest labour productivity. The industry

has the highest male-dominated workforce, though it is likely to see increased female participation as more women graduate with degrees in engineering and mineralogy. Most importantly, the mining industry is listed as one of the top five employment growth industries on the 2025 prediction index (Australian Workforce and Productivity Commission, 2012).

The major issue faced was the element of 'trust'. The chosen organisation operated in a very traditional managerial style, and the Human Resources (HR) department treated their employee workforce planning with great sensitivity and confidentiality. Apart from allowing the researcher access to a certain division in their whole organisation, individuals and the senior management team did not share any documentation with the researcher. The documents (which were shared after the initial face-to-face contact) were public documents that had been posted on the internet or intranet.

In order to conduct interviews, the researcher worked through the organisation's HR manager, who acted as the gatekeeper. According to Saunders (2006), a gatekeeper is one who administers and controls access in an organisation. The gatekeeper at Gothamfield acted more as an enabler for the researcher; in other circumstances, it could have been difficult to access the workforce, members of which are located hundreds of kilometres apart. Apart from being an enabler in the call for volunteers to participate in the research interviews, the gatekeeper also acted as a trusted link between the individuals and the researcher. This was an important link, as research studies have identified that the central barrier to successful recruitment of groups is mistrust. Furthermore, the gatekeeper, apart from assisting in publicizing announcement for voluntary participation in the research, also arranged for three different cadets to accompany the researcher during times appointed for the site observations.

In preparation for the fieldwork, the researcher worked with the gatekeeper through which participants were solicited, and through which the following was constructed:

b) Announcement to participate in the study, outlining who was targeted and how they may benefit from the research.
c) Information Package for participants that included: Participant Call Notice; Research Information sheet; and Informed Consent Agreement

Confidentiality was maintained from the time of contact with the participants through TO the writing up of the case studies

Rigour: Within the interpretivist paradigm, the researcher's ability to exercise systematic self-appraisal is a central feature of the research process. Lincoln and Guba's (1985) framework was applied for the purpose of assessing the rigour of qualitative research that included credibility,

confirmability, transferability and dependability. Guba and Lincoln (1985) posit that through a reiterative process shines a researcher's ability on persuasion of the quality, value and truth of the qualitative inquiry. Trustworthiness adds another dimension to a researcher's ability to persuade the reader that the inquiry contains the elements of 'truth value', 'applicability', 'consistency' and 'neutrality' (Lincoln & Guba. 1985, p. 290). This persuasive iterative process is the foundation for rigour (Yin, 1994; Casey & Houghton, 2010). Thus, in this dissertation, the rigour technique (demonstrated in Table 3) was used for trustworthiness.

Table 3: Summary of Techniques Established for Trustworthiness

Criterion Area	Technique
Credibility	Member checks Observation Iterative Questioning
Triangulation	Data triangulation Persons triangulation
Authenticity	Maintaining the voice of participants Contextualizing interpretation

Adapted from Lincoln and Guba (1985)

Credibility: Credibility was demonstrated by member checks, observation and iterative questioning as detailed below:

a) **Member Checks:** The researcher conducted member checks by first sharing the transcript and then the case narratives with each respective participant interviewed. This allowed participants to check the accuracy of their interview transcriptions, and provided them with an opportunity to eliminate any statements with which they were uncomfortable, and read their transcript and then their narratives. This is an important step as reconstructions are 'no-one's reality' (Lincoln & Guba, 1985 p. 315).

b) ***Observation***: The researcher visited the site on three different occasions. The first block visit of a few days of stay included first a meeting with the gatekeeper, who then organised the site visits to the mining and manufacturing plants. Visits to the sites helped the researcher to understand the complete nature of the business, the integration between plants, the roles and functions of the experts. The observations included engineers troubleshoot issues, make decisions, interact with their team cadets and perform their functions.

The subsequent two block visits were purely to conduct interviews. On each visit, the researcher spent a few days onsite. This prolonged engagement aided the researcher's understanding of the participants' socio-working environment. The researcher's ability to connect with the participants on the plants and shop-floor operations enabled the gain of the participants' connection and rapport. Lincoln and Guba (1985) assert that prolonged observations enhance credibility. As observations occur with the participants in their natural socio-environment, the researcher is analysing the observations in the iterative process, and this demonstrates rigour.

c) **Iterative Questioning:** The researcher used probing, a form of iterative questioning to elicit deeper insights and, at the same time, help establish the credibility of the data. For example, one of the semi-structured questions was: 'Can you explain to me what you deem was critical in the role you play in your job?' The researcher followed with a probe question, such as 'Can you explain the skill that is needed most in this role?' or 'Do you have an example to explain this further?' Some of these iterative questions were direct; some were indirect or more projective. In fact, probing by using iterative questions is a good way of conducting in-depth interviews, as Kvale (1996) succinctly puts it in a 'miner metaphor' as:

> knowledge is understood as buried metal and the interviewer is a miner who unearths the valuable metal … [T]he knowledge is waiting in the subject's interior to be uncovered, uncontaminated by the miner. The interviewer digs nuggets of data or meanings out of a subject's pure experiences, unpolluted by any leading questions. (p. 3)

Triangulation: Triangulation is the 'mode of improving the probability that findings and interpretations will be found credible' (Lincoln and Guba, 1985, p. 305) that increases the depth and consistency of the study (Flick, 1992; Denzin and Lincoln, 2003a). Silverman (2001) argued that triangulation is a form of comparison where different viewpoints produce verification of the subjects studied and positions the study appropriately. Triangulation increases the 'accuracy and credibility of findings' (Patton, 2002, p. 93) and increases 'validity and compensates for any weaknesses' (Marshall and Rossman, 1989, p. 79).

The researcher conducted two forms of triangulation in this dissertation. There are two main forms of triangulation: methods triangulation and sources triangulation. Person triangulation is a form of source triangulation where data obtained from various individuals and groups is collected. According to Moisander, Valtonen and Hirsto (2009), validity is established when findings obtained through interviews and other supplementary methods correspond and lead to the same conclusions. First, source triangulation was applied on the interview data gathered

from the three key cohorts: (a) experts; (b) management; and (c) cadets. The method form of triangulation investigated the emergence of themes, as well as any dissimilar data, collected from the interviews. These two forms of triangulation allowed the researcher to condense, cluster, review, and sort the data.

Authenticity: Authenticity allows the appreciation of participants' viewpoints and is especially important when the research intention is to provide an understanding of those viewpoints. Authenticity encourages the natural process of evaluating the dissertation without requiring verification or confirmation (Schwandt, Lincoln, & Guba, 2007). Patton (2002) considered representation of the participants' voices, experiences and views as important in the interpretation process.

Chapter 5 presents the verbatim recordings to allow this authenticity. Authenticity was a critical way of retaining their voices during the presentation of interpretation. In an attempt to keep the interpretation within the context of the research study, the researcher accounted for individual and collective voices by counting the frequency of responses occurring from the transcripts (Bowden & Green, 2010). In maintaining this sense of authenticity, the researcher's role is thus one of a co-producer and interpreter of the performance (Eriksson & Kovalainen, 2008). Given this position, during the study, the researcher was conscious of practicing non-bias through reflexivity. For example, the researcher noted any personal biases in a journal pad, which the researcher later used as a reflective resource.

3.3.3 Data Collection and Analysis

The objective of data collection was to ensure sufficient information collection from the experts to provide a rich and personalised description for the case studies. The sections below provide the details to data collection.

Sampling **-** Lincoln and Guba (1985) define sampling as 'representation of a population' (p. 200), while Patton (1990), Strauss and Corbin (1990), Miles and Huberman (1994), and Stake (1994) argue that attention to sampling is critical as it determines the kind of data gathered. Bowden and Green (2010) argue that sampling ensures that a 'sufficient number of relevant voices are heard' (p. 127).

Miles and Huberman's (1994, p. 34) sampling strategies were considered in the data gathering, which assisted in the case study research, including the following: (a) sampling was relevant to the research question; (b) samples were likely to generate information rich data to enable the phenomena being studied; (c) samples belonged to a general population; (d) samples had a

sense of reality; (e) ethical considerations had been made; and (f) the sampling plan was feasible.

The sample was comprised of engineers. The sampling in this study was based on the following considerations in order to best determine who could answer the research question:

a) The organisation had a large number of employees close to departing through retirement, and the organisation was keen to understand how to retain knowledge from this 'to-retire' cohort.
b) Given that the organisation's worksites were spread over hundreds of kilometres across regional areas, the availability of, and convenience for, the participants were considerations.
c) The sampling was mainly from the manufacturing metal plant of the organisation and not from its mining sites, as the former was suitable for inquiry due to proximity and ability to travel to the interview site.
d) The participants' availability for interviews and the need for substantial participation were also major considerations.
e) As a PhD dissertation, this project had time constraints and, in accordance with Schatzman and Strauss (1973), purposive sampling is practical because it is 'shaped by the time the researcher has available' (p. 39).
f) As this was a case study research approach, Patton (1990), an authority on sampling, states 'the logic and power of purposeful sampling lie in selecting information-rich cases for study in depth' (p. 169). Information-rich cases are those from which one can learn a great deal about issues of central importance to the purpose of the inquiry, thus the term purposeful sampling. Studying 'information-rich cases yields insights and in-depth understanding rather than empirical generalizations' (Patton, 2002, p. 230).

The participants, who all volunteered to participate in the study, fell into three broad clusters. This can be seen in Table 4.

Table 4: Participant Volunteers

Volunteers / Participants	Background
Cohort 1: Experts	Age 45–65 years (born 1945 onwards) Minimum 10 years' experience Expertise in a specialized field or role Male and Female participants
Cohort 2: Senior Management	Age 45–65 years (born 1945 onwards) Minimum 10 years' experience Management Specialist Male and Female participants
Cohort 3: Cadets and Novices	Born after 1961 Experience 0 years to 1 year Apprentice Male and Minimal Female participants

Design of Interviews: Alvesson (2003) and Qu and Dumay (2011) state that interviews that take a localist view in designing interviews is about collecting data within the social context that brings understanding to the independent perspectives. For instance, in this study, the experts interviewed were mainly from the manufacturing sector and their perspectives were within their social work environment. This approach helps with the general construction of meanings that the participants share. Semi-structured, in-depth interviews were designed to encourage the participants to engage in a more conversational interview. As Holstein and Gubrium (1995) note, the interview process is a 'pipeline for transmitting knowledge' (p. 3). To allow the flow of knowledge from the interviewer to the participant, in-depth, semi-structured interviews were used as a conversation-trigger with a specific purpose (Minichiello, Aroni, Timewell, & Alexander, 1995). Conversations between the participants and the researcher focused on the expert's perceptions of self-knowledge, work-life and experience. Interviewing was the primary tool in generating the information needed for the research questions. Observation and documentary sources were also used as secondary sources, as this was limited.

Denzin and Lincoln (2008c) support conversation in a research interview setting as they consider it essential to develop the skills of enquiring and listening. This method is particularly suited to the case study approach for this dissertation as it encouraged participants to share their insights and establish a 'conversational partnership' (Simons, 2009, p.44) with the researcher.

This partnership was important as it created a bridge of trust between participant and interviewer. It also helped the researcher to be responsive to participant sensitivities, even if it meant allowing them to speak freely and not recording them. Simons (2009) argues that an interactive style of interviewing is appropriate in case studies, because it equalises the relationship between the interviewer and the participant, and thus allows both parties to co-construct meanings collaboratively. The use of an interactive style of interview assists in removing the interviewer's bias and judgments, and recognises the importance of maintaining the voice of the participant. This forged a type of 'interactive partnership'. An 'interactive partnership' is where the researcher has the task of joint sense-making with the participants. This partnership necessitates active listening by giving the speaker the chance to finish, but not paraphrasing or intruding with comments. Interactive partnerships give the speaker a chance to reflect on their content and their emotions. Finally, these partnerships allow the researcher to gain a greater understanding of the information the participants are sharing.

a) **Semi-structured Questions:** The interviews contained mostly semi-structured questions. There were also some standard close-ended questions to gauge the experts' awareness of the organisation. These closed-ended questions then helped with the later insertion of probes to draw out more details. The semi-structured questions were designed to address the participants' perspectives on knowledge loss from their work practices, their networks, the system and the organisation (See Appendix 3 – on interview questions). The in-depth interview questions were planned for one-hour duration. The researcher conducted interviews of four to five persons each day over four consecutive days in one of the vacant offices in the main administration building.

Interviewing: When conducting interviews, the questions posed affect the participants' responses (Kvale, 1996). Patton (1980), Rubin and Rubin (1995), Kvale (1996), and Simons (2009) posit that techniques such as allowing interaction, adopting active listening and building on rapport, by being responsive to the participant while acting as a passive knowledge-sharer are ways of demonstrating good equalising interviewing skills.

As a warm-up to the interview, the researcher initially gathered the participants' details and some mandatory questions on the role and years of experience. This five to 10 minute data gathering helped the researcher gain an understanding of the participant's manner and helped build some initial rapport. More importantly, it allowed the participant to become comfortable responding to questions that may have otherwise seemed too personal or even confrontational. The close-ended questions provided an

early insight into the expert's fit and knowledge of the wider perspective of the organisation.

Conducting a standard semi-structured interview enabled the reduction of variation and allowed the researcher to use probing questions for clarifications. Through these techniques, participants were able to outline relationship connections in the workplace and describe particular events and incidents that were relevant to them. The probing questioning approach was successful because it enabled the researcher to gain insights into specific aspects of experts' knowledge and skills. All of the experts interviewed were native English speakers, so the scope of bias via misinterpretations or assumptions was minimal. A non-directive style of conversation focused on drawing from the participants their perceptions of the value of their knowledge to the organisation and the contribution of their expertise towards the organisation's performance. This style involved first posing semi-structured questions and then engaging in an interactive conversation so that probing questions added that were directed by the participant's narratives.

b) **Site Visits:** Secondary data was gathered through observations. Observations were made of plant sites, shop-floors, engineers and team members at work. Research experts state that observation is a useful research tool and can take different forms (Marshall & Rossman, 1995; Simons, 2009). Patton (1990) summarized the value of participant observation research as including observation of the activities, first-hand researcher experience, and observation of activities in which employees and participants are unwilling to participate.

Also, this observation helped to provide context for the research. Visiting Gothamfield's mine and manufacturing plants was a formal, unstructured observation exercise, with a view to gaining an understanding of the operations and the work environment and practices of the experts. Due to the location and the lack of funding for this research, only a three-day intensive site visit was available to observe the work conduct, practices and people engagement in the organisation.

The site visits enabled the researcher to observe manufacturing processes, which entailed a fair understanding of the supply chain from the mining sites to the finished metal products. Included were observations of people performing their day-to-day functions, which gave the researcher, at least, a basic knowledge of the nature of work and the symbiotic relationship between people and machines. The site visits were

particularly useful as they gave the researcher an insight into the working environment, the kinds of roles in each area and the employees' work tools. This helped the researcher engage in 'interactive partnership' discussion.

The site visits and observations were crucial in producing representations and interpretations of the social world, particularly when relating the meaning and experiences of the participants to the phenomena. Stake and Kerr (1994) have reported that site visits and observations are important because images conveyed by participants are personal, socially constructed, and incomplete.

c) **Transcription of In-Depth Interviews:** Miles and Hubermann (1994) and Brott (2002) offer different views regarding the researcher's task of transcription. Miles and Hubermann (1994) stated that transcribing unnecessarily overloads the researcher, whose focus should be on the analysis of data. Conversely, Brott (2002) suggests that transcribing can benefit the researcher as it familiarizes the researcher with the interview content. For this dissertation, interviews were taped and transcribed by a commercial transcription service. The researcher then compared the notes taken during the interview sessions, noting nuances in the transcripts that may have been missed in the initial interviews. Participants were provided with the opportunity to review and amend transcripts, before the interviews were coded and analysed.

3.3.4 Content Analysis

Content analysis involves reviewing, coding, categorising, synthesizing and interpreting the data gathered. Attride-Stirling (2001) defines data in the qualitative research context as 'evidence, empirical or otherwise given to support a conclusion or claim' (p. 387). The data contained metaphors and analogies that shaped the experts' views. The researcher gathered the data primarily through interviews. The researcher also collected data through site observations and document review. The sections below discuss the analytical techniques and tools used in this dissertation.

Software Analysis Tool: NVivo is a widely-used qualitative software that is designed to meet three specific needs of qualitative researchers. These are (a) the application of character-based coding; (b) facilitation of analysis for rich (formatted) text; and (c) the ability to edit text without invalidating earlier coding (Bazeley, 2007).

NVivo was used for coding and sorting the responses of the participants involved in the study. Coding is an abstracted representation (Strauss & Corbin, 1998; Bazeley, 2007) of the themes

within the interview text. In addition, the use of coding enables presenting the findings and analysis under a theme. NVivo helps in applying codes consistently (Weitzman, 1999; Guest, MacQueen, & Namey, 2012).

The software was helpful in the presentation of the overall codes and ideas emerging from the interviews. The capacity of NVivo to present a textual summary of the themes aided in the identification of irregularities and in the clustering of ideas into the main code (Bazeley, 2007). The software also assisted in comparing the text under each code; analysing the significance of a participant's words; and contrasting the text of each participant who may have used either the same or a different terminology.

Apart from NVivo software providing a robust data tracking and management system, it also keeps an audit trail of revisions. This assisted in ensuring quality in the handling of the data collected, increasing the accuracy of the findings. NVivo was also helpful in rapidly retrieving data when there was a considerable amount of data to search.

Units of Analysis: Collis and Hussey (2003) state that the units of analysis can be single or multiple organisations, people, processes or events. In this dissertation, the experts' knowledge portfolio as a unit of analysis was of interest. The experts who participated in this research are only a sample of those represented in the organisation, and they are persons who have great skill in a specific field. Table 5 illustrates the participants involved in the study and the reasoning as to why they formed as an important cohort in the dissertation. The participants come from the three clusters mentioned in the sampling section. The questions of 'what knowledge will be lost' and 'how they perceive this will be a loss to the organisation' were omnipresent in the entire process from interviewing to data collection and analysis. Giorgi (1985) describes this clustering as a technique for demarcation of data. The researcher applied this technique to understand the participants' positions when they narrated stories or incidents.

Table 5: Participants and Significance to Study

Participants	Significance to the Dissertation Study – Reasoning
Current Experts due to depart (Age range: 45–65 years as of 2010)	Their current contribution that they deem valuable Their perspective on their current contribution that the organisation deems valuable Their perspective on the ageing phenomenon and how and why that might affect the organisation Their confidence and concerns on how the organisation may 'operate' upon their departure and whether they have transferred their expertise to a new entrant.
Cadets (Born after 1961)	Cadets who worked in the same plant as the experts Had mentors in the above cohort Engineering background
Senior Management and HR	Their perspective on the departure of experts and how that may affect the organisation Strategies in place to address issues Gap realized and unrealized

Thematic Analysis and Coding: Thematic analysis was used to evaluate the emerging patterns and trends generated in the interviews. Thematic analysis is a process for encoding, organising and presenting qualitative data (Miles & Huberman, 1984; Boyatzis, 1998). The researcher combined Ryan and Bernard's (2003) thematic approach with Moustakas' (1994) analytical process. Garza (2011) stated that thematic analysis was not meant to be a 'prescriptive procedure' (p. 55), but it is the researcher's responsibility to clarify the approach. The reason for combing two scholarly process was because Ryan and Bernard's (2003) process was instrumental in the detailed level of analysis, while Moustakas' (1994) process assisted in the themes to be drawn in context. The combination of the two processes was particularly useful for reflective analysis. Moustakas' (1994) analysis process was applied to ensure the themes were contextualized which required the following steps:

a) Listing and preliminary grouping of every relevant experience
b) Reduction and elimination of extraneous data to capture essential constituents of the phenomenon
c) Clustering and thematising the invariant constituents to identify core themes of the experience

d) Final identification and verification against the complete record of the research participant to ensure explicit relevancy and compatibility

e) Then using Ryan and Bernard's (2003) approach the researcher analysed the content in the following ways:

f) Analysis of words and in context

g) Analysis of sentences and blocks of texts

h) Analysis on the use of metaphors and workplace terminologies by the experts

i) Analysis of repetition of words in context

j) Analysis of words and phrases and their causal relationships

k) Analysis of sub-themes

l) Analysis of expressions by the experts on subtler cultural and symbolic themes

Coding is a crucial aspect of thematic analysis. Strauss (1987) refers to coding as 'fracturing' or 'segmenting collection of data or information into discrete units' (p. 29).The coding organised the data from each set of interviews in the context of the knowledge contributions through the experts' roles, their perceptions of value contributions, and their perceptions of knowledge loss. Finding the most suitable process for coding was important before plunging into the data and extracting. The critical reason for using both Moustakas' (1994) and Ryan and Bernard's (2003) process was to keep the extraction close to its meaning. As Mishler (1986) has argued, coding does not fix or totally represent the perspectives of the participants. This was exactly the process the researcher attempt with an aim to understand, contextualize and preserve the original expressions of the experts. The interview transcripts, shared organisational documents, and observation reports were coded in NVivo10 using the general open codes. Following this, codes were re-examined and compared to see if there were any differences or similarities. Context is especially important in providing meaning for analysis; the researcher focused on the content that related to the node title to understand meaning when reading the reports.

The patterns that emerged were captured, and the similarities and differences were categorized and connected to the research questions. Miles and Huberman (1994) referred to this technique as 'composite sequence analysis' (p. 204). It is through the coding that themes emerged. Themes are 'dynamic expressions and assertions' (Ryan and Bernard, 2003, p. 86). Ryan and Bernard (2003) claim that themes are only expressed through data along with the researcher's prior theoretical understanding of the phenomenon, which is evidenced mainly by the questions posed during the interviews.

Data Interpretation: Utilizing NVivo, the data was coded based on the interview transcripts, mainly to help describe the phenomenon of knowledge-loss. Critical to coding and interpreting data was the desire to retain the richness and complexity of the data. In writing the themes, the

researcher decided that, along with the interpretations, including the voice of the experts in the case narrative was important. To a researcher, the cardinal rule applicable for writing the thematic analysis is to ensure that the written analyses demonstrate an organized scrutiny of the dissertation topic.

3.4 Chapter Summary

This chapter explained why an interpretive paradigm and case studies had been chosen for the study at hand. This chapter outlines the appropriateness of undertaking qualitative research in examining the impact of knowledge loss in an organisation. The chapter details the sampling, data collection and analysis procedures used in the study, as well as the measures used to ensure valid and reliable data. Applying Jonker and Pennink's (2010) theoretical iterative approach to research, the researcher's reflection as a part of the accumulated learning in conducting this fieldwork is shared in Appendix 1.

CHAPTER 4 – ORGANISATIONAL CONTEXT FOR CASE STUDIES OF EXPERTS

4.1 Introduction

This chapter introduces the organisation's history, position, and uniqueness as an employer to provide a context for the expert narratives and the experts' perspectives on knowledge and knowledge loss. Employees have the potential to influence an organisation's strategic direction. According to March (2010), employees influence the vision, mission, and strategic operations of the organisation. Most of the experts have been with the organisation for more than 20 years. Hence, the organisation's attributes, history, dynamic processes and activities reflect the behaviours and actions of the organisation's members. The experts' learning and experiences depend on the opportunities provided by the organisation. Understanding the dynamics and structure of an organisation allows the researcher to understand the phenomenon of knowledge loss (March, 2008).

This dissertation presents eight cases illustrating experts' linkages between insights and knowledge using their own voices and perspectives. Warr (2004, p. 580) posited that case studies develop 'context-dependent understanding' of the 'values and practicalities,' this is the position that the case studies of the experts fulfil in this dissertation. The expert narratives describe working lives and their contributions to organisational knowledge. The experts are engineers at Gothamfield in District 1, in Australia. Eight expert stories are presented as separate case studies within this chapter. Each expert has been given a pseudonym.

The terms 'stories' and 'narratives' are used interchangeably throughout the dissertation. Narratives allow the reader to imagine the actual situation described by the individual recounting the experience. The narratives shared by the experts describe various incidents, events, stories about others, recollections, general statements, threads from interview conversations, and answers to semi-structured questions. These narratives reveal information about the mining-manufacturing plant operations, and as such, provide insights into experts' employment, learning, and their acquisition of distinct competencies and capabilities. The narratives also demonstrate the experts' practical experiences and innate strengths. A thematic analysis of all thirty participants follows this chapter with a discussion of the findings in Chapter 6, which provides links from data interpretation and implications for practice and theory.

4.2 Context for Case Studies

The economic challenges and positioning of Gothamfield within the community provides a context for the narratives shared by the experts. The sections that follow discuss the manufacturing position and the larger community where Gothamfield is placed.

4.2.1 Manufacturing in Australia

The current research was conducted during a challenging economic period for the mining industry and manufacturing sector. The challenge facing the manufacturing sector is the diminishing skilled workforce and the need to continue to be innovative. Historically manufacturing accounted for nearly 70% of exports in Australia. Based on this history and importance of manufacturing as an economic booster to Australia, the Minister for Manufacturing Innovation and Trade reported that $109 billion was to be spent on new pipeline projects (Koutsantonis, 2012). Employment in mining is growing rapidly. Between 2008 and 2012, an additional 150,000 people were employed in the mining sector. This is considered a major economic growth in Australia (Sloan, 2012). According to industry reports, a key factor in Australian manufacturing organisations' resiliency is the ability to operate at highly efficient productivity levels because of human, intellectual, and material capital optimisation (Future Marketing Industry Innovation Council, 2011). Table 5 shows the growth rates for the mining and manufacturing sector. The trends depicted in this table contextualise the realities faced by the industry which has clearly been growing sharply since the early 2000s. Some indications suggest that this rapid growth has begun to plateau.

Table 6: Industry Gross Value Added and Growth Rates of Mining and Manufacturing Sectors

Industry	2000-01 ($b)	2009-10 ($b)	2010-11 ($b)	Av. annual growth rate 2000-11(%)
Mining	95.8	121.1	117.7	2.1
Manufacturing metal products	18.2	22.3	21.9	1.8

Source: ABS, *Taskforce Report*, Catalog. No. 5206.0, 2012

4.2.2 Background of Gothamfield Limited Township- District 1

Since the 1970s, Gothamfield Limited has been actively involved in sustained mining operations in District 1 (Gothamfield, 2013). Although a number of smaller companies operate in the community, Gothamfield Limited is one of a few large organisations in the mining industry and manufacturing sector in Australia.

District 1 has a population of approximately 23,000 and enjoys a low unemployment rate of 4.9% (District 1, 2012). The District 1 community is committed to industrial prosperity. Over the past decade, the mining industry has experienced an economic boom which has attracted investors and spurred growth in both the industry and the community. The Australian government has invested more than $100 million to support the infrastructure and health care needs of the community. The State Government's envisioned District 1 remains as a major location for manufacturing and mining families and the key employer for this industry (District 1, 2010/2011). Tables 7 and 8 show the employment data by wage and occupation that may be relevant for District 1's working population in Gothamfield. Data presented in Table 7 shows slight increases in the age groups above 45 years old, there is still an increase. There is, however, a decrease in the 15-24 years group.

Table 7: Wage and Salary Earners by Age (Period Ending June 30)

Age range (%)	*2006*	*2007*	*2008*	*2009*
15 to 24 years	18.1	18.4	19.2	18.1
25 to 34 years	20.5	20.3	20.4	20.5
35 to 44 years	26.2	26.0	25.4	25.2
45 to 54 years	21.6	21.7	22.1	22.7
55 to 64 years	12.0	11.9	11.4	11.8
65 + years	1.6	1.6	1.5	1.7

Source: ABS, *National Regional Profile: Gothamfield* (C) (Local Government Area 48540), 2011

Table 8 shows the occupations of the employed. These tables show that many of the individuals in District 1 provide the trades and skills required by the local mining industry, and the community is dependent on the industry's performance for its members' livelihoods and infrastructure. The data suggests that the occupational groupings are relatively constant over time.

Table 8: Wage and Salary Earners by Occupation (Period Ending June 30)

Occupation	*2006*	*2009*
Managers	8.9	8.3
Professionals	13.6	13.8
Trades persons and related workers	17.9	17.0
Community and personal service workers	9.5	9.0
clerical and administrative workers	11.1	11.0
Sales workers	9.3	8.8
Machinery operators and drivers	12.4	12.3
Labourers	15.0	14.6
Not stated	2.2	5.1

Source: ABS, *National Regional Profile: Gothamfield* (C) (Local Government Area 48540), 2011

The manufacturing business in District 1 provides the community with job opportunities, and District 1 is considered one of the top 25 'hot' towns in Australia (District 1, 2012). The company is significantly contributing to economic growth at the local and national levels with over $500 million in investment in the past six years. These achievements have earned the company substantial recognition from private business groups and government agencies. The company is currently working to achieve the organisational goals and objectives outlined in their social responsibility commitment, which include the following:

1. An investment of over $600 million in District 1 steelworks.
2. Collaboration with the District 1 Economic Development Board on regional development issues such as unemployment.
3. A joint venture with both State and Federal Governments and the District 1 Economic Development Board
4. The hiring of an additional 60 apprentices in the 2006/2007 financial year.

4.2.3 The District 1 Community

District 1 was founded in 1901 when the Torn Mount Proprietary Company (TMP)[2] began metal smelting. In 1937, during the construction of a new blast furnace and a new harbour, the population began to increase. In 1945, the government (in an effort to increase skills in 1945) welcomed the arrival of displaced individuals from Europe. From a small population of 1,400 in 1937, the region today has a population of 23,000, the majority of whom are highly specialised workers. The region's existing mining operations collectively contribute $159 million to the gross state product and are expected to grow steadily (Regional Development Australia, 2015). The manufacturing sector contributes approximately $341 million to the State's gross regional product and employs 3,331 people, accounting for 13.5% of regional employment.

Mining communities have been described as those affected directly by employment and indirectly by the environmental social and economic impacts of mining operations (Veiga, Scoble, & McAllister, 2001). Such communities are often complex and dynamic since they are the source of social relationships within which people share similar values and interests even if they are not from one specific locality (Crow & Allan, 1994). These characteristics are evident in District 1, a multicultural community representing some 70 different language groups which employees describe as a community-driven township with strong interpersonal affiliations.

4.2.4 Gothamfield Limited: The Organisation

Manufacturing is the engine of Gothamfield's business. Gothamfield has global representation. In 2014, Gothamfield reported that of the 9,269 employees, 7,822 are based in Australia, with 1,131 in North and South America, 201 in Asia and a small number in Europe and Africa. The organisation manufactures approximately 40,000 metal products and distributes to over 30,000 customers in the heavy metal industry. In 2011, Gothamfield announced the acquisition of metal/mineral assets in Australia valued at A$346 million as part of a planned market expansion program. Gothamfield invested $200 million in port facilities in District 1, which was projected to increase export capability from 7 million tonnes to 12 million tonnes per annum. By combining mining and manufacturing operations, the company benefits from the secure availability of low-cost metals for its manufacturing plant, which is the major source of a special product and commercial business. The plant produces approximately millions of tonnes of raw steel each year. The mining arm encompasses a range of sites linked by a common operation. Two types of metals are mined: one metal is used for Gothamfield's consumption, while the other metal is used for export purposes, a central feature of business growth. Since 2006, the company's exports have increased from 1 million tonnes per year to 6 million tonnes

[2] This is a pseudonym for the company that first started in District 1.

per year. This has diversified the business and enabled Gothamfield to capitalise on the ever-growing demand for iron ore, particularly from China.

The company achieved the following based on these commitments:

1. Investment in District 1 steelworks.
2. Employment of cadets enrolled in the internship program.
3. An increase in the number of steelwork jobs.
4. The nature of work at Gothamfield District 1 is highly specialised, technical, and certain jobs are labour intensive. While the work involves complex processes, the company does not exploit technology and information to a high level. The mining and manufacturing site plant represents a well-designed supply chain system characterised by an organisation of people with knowledge, skills, and socially interacting in a complex setting. Figure 3 shows an illustration of the mining-manufacturing organisation of Gothamfield.

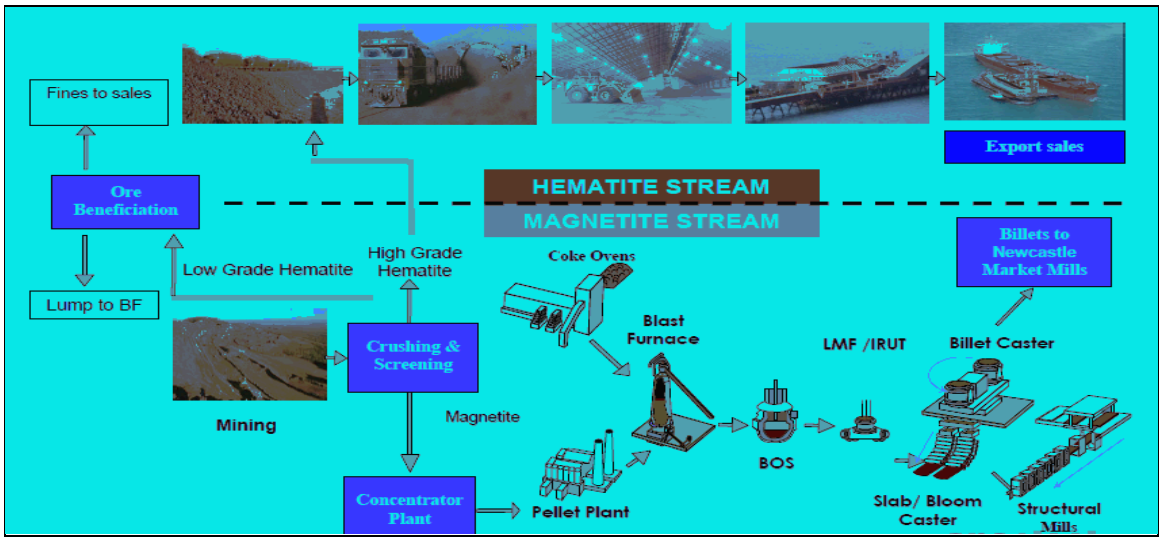
Gothamfield HR: Gothamfield District 1 is dependent on the ready availability of workers from within the local community. The company's policy is to recruit employees who are most likely to adapt to the local community. The company profile and the community-centred lifestyle of employees are key components of the recruitment packages. The company also recruits talent from various parts of the world. For easier cultural assimilation, the organisation claimed that they exercise this prerogative with a set of selection criteria and recruit only nationalities that are already represented in District 1. This, they argue, is intended to help the new recruit find their national cultural connection within District 1. The mining-manufacturing plant is central to the District 1 economy and provides direct employment to 1,436 residents and approximately 800 local contractors. For example a Filipino worker, who migrated to District 1 and was employed by Gothamfield, commented:

> If you want to work for a company that will make your career flourish while enjoying a good lifestyle, Gothamfield is a must-experience. Having a strong multicultural workforce offers a network that means you can have an enjoyable job and rewarding experience… HR representatives assisted me all the way and introduced me to the Filipino community (Gothamfield, 2014).

Members of Gothamfield's management team reported that they invest heavily in recruiting the right talents to fit both the organisational vision and the broader community. In relation to the nature of employment terms in Gothamfield, permanent employees account for 77% of the workforce, while 23% were under contract. The workers that Gothamfield seek most are those with qualifications and experience in engineering, mining and manufacturing. Then the

organisation also has support staff needs in administration and sales. Figure 3 below just shows Gothamfield's business focus.

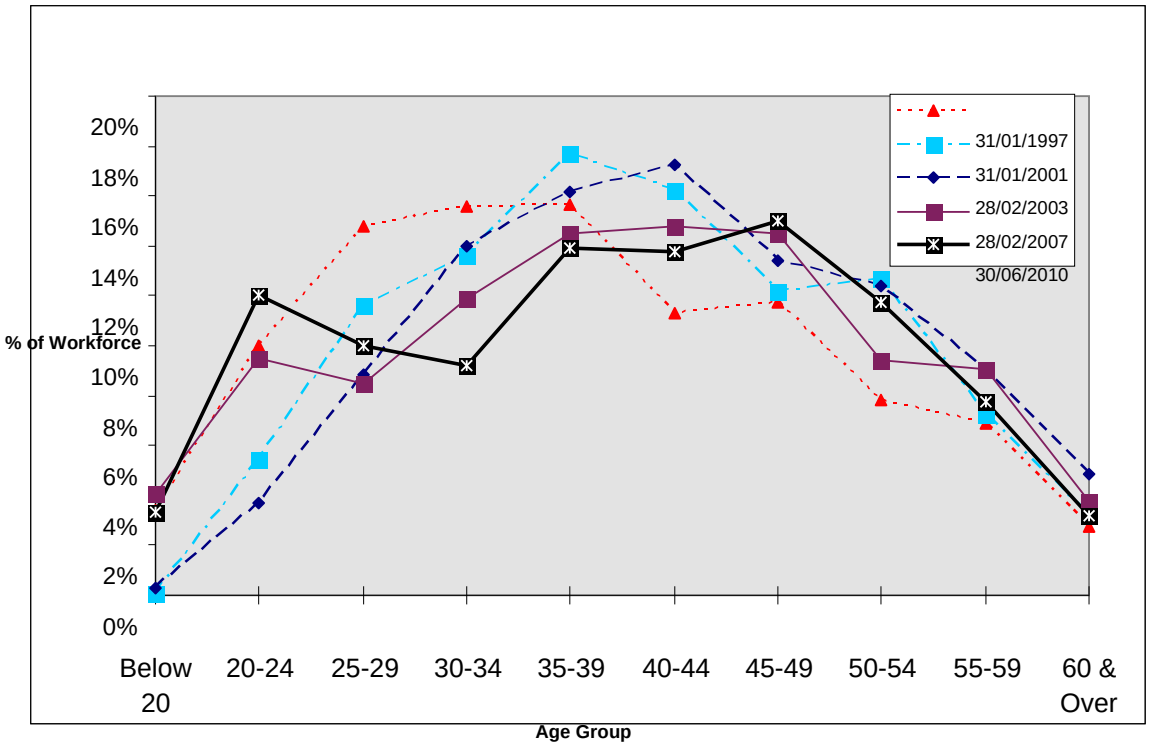
Figure 3: Progressive Phase on Mining-Manufacturing Supply Chain



Source: Gothamfield, *Internal Report*, 2011 (Permission obtained for the use of the illustration)

This figure highlights knowledge-specific outcomes that are required in each phase of the supply chain and thus the specific set of skills that the organisation needs. Set within this robust supply chain are value links that keep the employees and community in harmony with values of respect, care, safety, and strong relationships. The extent of the knowledge loss phenomenon experienced at Gothamfield is understandable given the length of some employees' service, which creates deep reservoirs of knowledge, learning, and experience. Figure 4 shows that even though there is a decline of the workers aged from 45 to 60, it also shows that significant percentages belongs to this age bracket and are still in the workforce when they are aged 60 years and beyond.

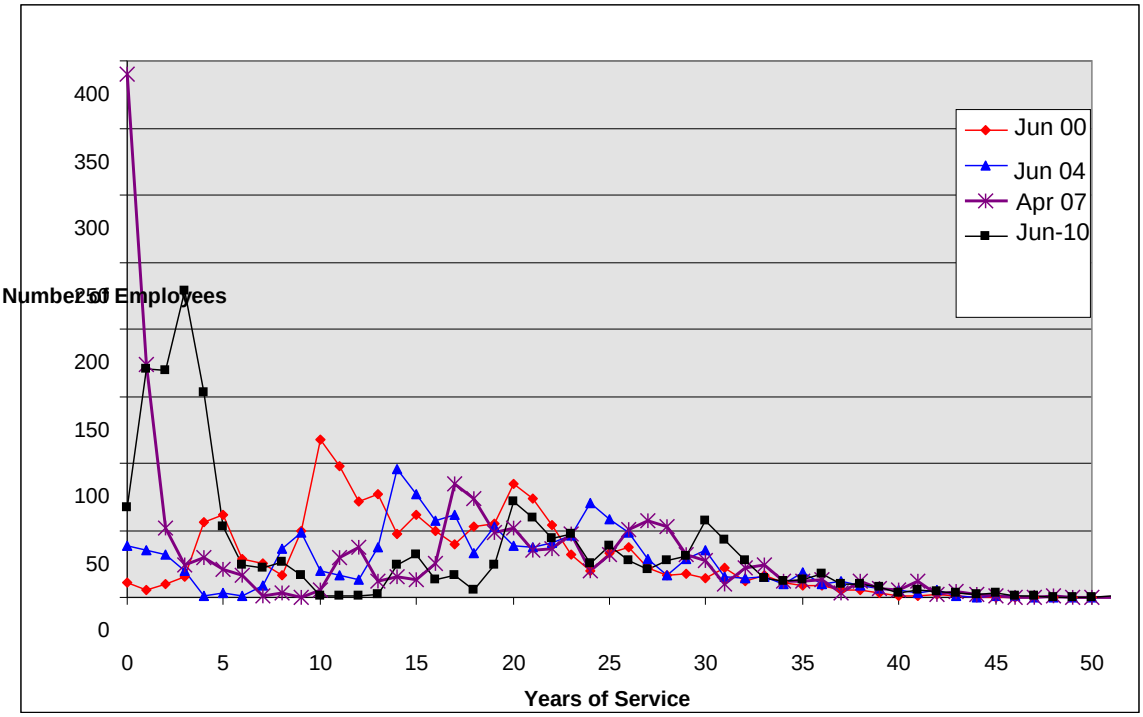
Figure 4: Age Distribution within Mining-Manufacturing



Source: Gothamfield, *Internal Report,* 2011 (Permission obtained for use of the illustration)

Figure 5 below shows a high attrition rate in the first 5 years, however the organisation did not wish to share the age bracket of those departing the organisation. Due to the challenging manufacturing environment, where Australian manufacturing was shifting overseas, the workforce numbers had significantly reduced in the year 2007. The year 2010 shows growth. Twenty years of service was the average longevity in the organisation.

Figure 5: Service Years within Mining-Manufacturing of Gothamfield



Source: Gothamfield, *Internal Report* (2011) (Permission obtained for use of the illustration)

4.3 Chapter Summary

This chapter aimed to provide a brief contextual understanding of Gothamfield and its position in mining manufacturing, as well as the important role it plays in employment for the region in Australia. The following chapter presents the case studies of eight expert perspectives in order to provide a holistic view.

CHAPTER 5 – EXPERT CASE STUDIES

‘The narrative scheme serves as a lens through which the apparently independent and disconnected elements of existence are seen as related to parts of a whole.’

(Polkinghorne, 1988, p. 36)

The following eight case studies present the narratives shared by the experts. Each case study has been organised according to the key concepts of: expert knowledge, knowledge contribution, and KM and support. By presenting the case studies in this way, the researcher aims to develop an understanding of the knowledge contribution that employees bring to an organisation, as well as the potential loss of this knowledge contribution.

5.1 Gabriel

5.1.1 Authentic Expert Knowledge

Experience: Gabriel is 48 years old, male, and holds a bachelor’s degree in mechanical engineering. Gabriel has been with the organisation for 21 years and, at the time of the interview, was a senior engineer working with junior staff and cadets. His first full-time position was with Organisation X before Gothamfield assumed control of the company. Gabriel has been living in District 1 since 1967. Gabriel describes his work as satisfying, and he enjoys project involvement. He likes to assume a more individualised role and was considering early retirement in the next two years.

Titles and Positions: Gabriel was the service shop engineer at the time of the interview. He started as a laboratory assistant and apprentice on the shop floor. He has held at least ten different roles during his 21 years with the organisation, including conducting several in-house training sessions. Gabriel claims that his current position description is not up-to-date, that he never had a job description, and the position description does not outline the true nature of his job. He explains that he is a supervisor overseeing the division’s work and budgetary functions. When asked about the different titles he has held, Gabriel (1) could not recall and (2) attributed his lack of memory concerning these titles to the belief that they were position titles only and did not reflect the actual roles he held. Specifically, he said:

> *Sometimes the title, you call yourself something and that strictly might be the exact title name, it was something like caster service shop leader or something like that, coke ovens*

maintenance superintendent … and then my current title, my group of current titles, which I think is summarised best as engineering coordinator. (INTFP01, L75-80)

He elaborated further: *'It's like three titles, the same job but three titles; this is why I get frustrated with the whole title thing*' (INTFP01, L81-87). His current job title encompasses his role over three plant areas, but his role is even broader. Gabriel suggests that a title with a label based on the actual role and not the areas of responsibility might be more suitable for him.

5.1.2 Knowledge Contribution

Know-how: Activities, Actions, Responsibility, and Accountability: Gabriel's core job function is to ensure that the plant runs smoothly during technical functions such as *'vibration analysis, oil analysis, and thermography, all these technical functions are done by a specialist group'* (INTFP01, L88-89). If this does not occur, other interconnected functions in the plant are disrupted. Gabriel links routines and administration by explaining that routines are a systematic way of capturing and storing information for reporting purposes. Gabriel expresses a dislike for routines that involve paper trail documentation and substantial administrative work. Gabriel considers that his knowledge and skills are not put to best use by the need to spend more than 70% of his time on routine administration. Relating that his capability had not been used to its fullest potential, Gabriel said, '*I prefer the old fashioned plant engineering where you go out there and 'fight the fires' '* (INTFP01, L281-282).

Budgeting is a key strategic responsibility for Gabriel. He draws the annual budget for the division and oversees budget management by delegation. Gabriel likens his work to that of a specialist. He prefers plant work, which he believes utilises his knowledge and skills more effectively than administrative office work. Gabriel emphasises that he believes he is really a 'fire-fighter' when it came to resolving certain issues. He says: '*The solution really comes from the experienced people*' (INTFP01, L528).

Despite his strong desire to be troubleshooting problems on the shop floor, Gabriel realises that documentation tasks are important and described his shortcomings of his own work attitude and behaviour, stating: '*I know I need to be a bit more systematic about what I do*' (INTFP01, L281-282). A systemic process that was established by new management was unsettling and took Gabriel and others away from what they believed to be the true technical job function of plant engineers, which is associated with grease, dirt, and grime rather than documentation. According to Gabriel, the shop floor workers are acquainted with grime and greasy work often considered an indicator of their expertise. This, he believes, demonstrates learning. Although

Gabriel's position encompasses several functions and roles, he pinpoints exactly what he believes to be his critical skills and knowledge:

> *I think the critical bit is to try and keep a push on with the reliability side, just keeping a feel of how your plant is going through the vibration analysis' (INTFP01, L267-277).*

> *It's hard with a work group that lives in two locations … proximity. And quite a big area. So I find it hard just keeping track…you need to be quite organised to keep track of where all the jobs are (INTFP01, L500-503).*

Gabriel recognises his passion and his weakness in his desire to be involved in '*fire- fighting*' rather than managing and being proactive. Gabriel appreciates the importance of passing knowledge on to fresh engineers so that their know-how is transferred:

> *And I think to do it really well … you shouldn't get side-tracked with these nice fire-fighting jobs that keep coming up. So, you need to be dedicated enough to not get side-tracked with the fire-fighting jobs and delegate those onto someone else (INTFP01, L320-324).*

Gabriel likens his role to fire-fighting when describing his responsibilities. Fire-fighting is a highly technical skill that requires professionals with years of training in both general fire-fighting techniques and specialised areas of expertise. Many of the Gothamfield employees use the term 'fire-fighting'—a common way for experts to express their accumulated knowledge and their know-how. These experts enjoy fire-fighting situations immensely.

Gabriel considers the knowledge require to repair broken equipment as innovative practice. The equipment in the plant was inherited from Organisation X (the ownership company before Gothamfield assumed control), and the longer serving engineers have intimate knowledge of the equipment. Gabriel addresses this innovative aspect of his ability to fix equipment saying:

> *I guess we have got an old plant and sometimes you need to be a bit innovative to rip the old thing out and stick the new thing in. So, this coupling up a new bit of kit to an old bit of kit quite often does require a bit of innovation and, normally, you would brainstorm ideas and whatever to try and make it fit (INTFP01, L121-124).*

Relationships and Engagement: Gabriel agrees with his immediate supervisor's evaluation that he is not an effective delegator; however, he justifies this by the strong system of relationships and engagement that is part of the organisation's structure and work attitude:

Engineers have got a clear line to their parts of the plant so, going back, I made a comment that each of the areas has their own structure, so each of the areas has an engineer and coordinator or an engineer or a reliability leader. Each plant area also has a set of team leaders responsible for a small section of the plant, and there is a one-to-one relationship between the engineer and the team leader. So, the team leader has a little problem. While he needs to go through a system to get a job up, he's got an engineer who he can go directly to, so, effectively, if I went to sleep for a day, you know nothing bad would happen [both laugh] … For a day, well stuff mounts up, doesn't it? Yep, but the system should work without me effectively (INTFP01, L235-243).

In the interview with Gabriel he relates that the positive and motivating aspects of his work are engaging with the team and discussing technical issues. His capability and enthusiasm concerning the one-on-one relationship that he has established with his team leaders were evident in the interview.

Emotional Behaviours: Work relies not only on technical knowledge, but also on a range of soft skills and innate talents. Gabriel reasons: '*You need to be honest…but that is a specialty in itself, I guess*' (INTFP01, L39-40). Gabriel comments on his feelings towards Gothamfield and what he believes he possesses that are valuable to the organisation:

I think the fact that I care [laughs]… I do want to see the company succeed, and I would like to think I do what I can to the best of my ability … particularly, when we are fire-fighting and there's a disaster [both laugh] (INTFP01, L518-521).

Gabriel believes it takes time to build trust and mutual respect with team members. He perceives the greatest challenge facing a young engineer is gaining the trust of experienced peers, which takes years to build, *'Some people do have a natural inclination for it, and then some do not necessarily, and they need years and years of experience'* (INTFP01, L375-376*).*

Continuous Experiential Learning: Gabriel believes that his competence in addressing and solving problems is linked to his ability to take calculated risks based on experience: '*You can sort of do them … because you have done them quite often, almost without thinking we have taken calculated risks*' (INTFP01, L304).Gabriel's view on learning with respect to someone new or inexperienced is thus:

While any experienced person in terms of their technical ability would have to trust their technical skills, I see a less experienced person would have the capability of handling the personalities involved if they have that inclination. You get that inclination by having a

natural ability for it, for which you wouldn't have to need the experience. Or, if you haven't got the natural inclination for it, you learn how to do it (INTFP01, L368-372).

Gabriel comes across as a man with patience and a great desire to learn. He expresses his ability to recognise talent, and can frequently influence and inspire many in his workplace. This is a balancing act of sound and rigorous knowledge and skills, while simultaneously aligning those skills with organisational goals. This realisation of values has been built through experience and is evident from the data gathered from Gabriel. He responded that continuous learning is critical for the survival of the individual and the organisation, and he relates to learning as a way to be organised, '*Learning is about trying to be organised, I think. Which I am still in the process of trying to get, get on top of myself I guess*' (INTFP01, 508-509). He portrays the organisation as a place that provides the opportunity to learn: *'Gothamfield is a good company to work for. I think the jobs are interesting, it's a very diverse plant so, from a technical side, lots of stuff to learn*' (INTFP01, 580-582).

Gabriel reiterates that he never stops learning: *'Yeah, still learning, absolutely'* (INTFP01, L626). Gabriel's responses may indicate that effective organisational learning is taking place, but that there is still room for improvement. His time with the organisation has allowed Gabriel to learn that the traditional ways of doing things do not work, and he has introduced change. Gabriel has learned from his experience and shares the changing plant experiences:

Now it's a bit more the other way, we get the vibration people in to do regular monitoring so they are aware things are starting to vibrate worse and worse and worse. So it has changed around a little bit. So all the sciences have always been here, we have had them on site, now it's getting the on-site people to take some responsibility if you like…and use the tools slightly differently (INTFP01, L28-33).

Gabriel is at a point in his career where he is reflecting on work practices, making changes, and finding challenges. Gabriel shared some key elements of learning and wisdom during his time in Gothamfield Limited. He expresses words that were deeply rooted and meaningful to him such as '*respect*', '*caring*', '*wishing to succeed*', and '*dedication*':

You can teach people to be good engineers, like good scientific engineers. You can teach them all the calculations and all those formulas and stuff, but you can't necessarily teach them how to be dedicated (INTFP01, L604-606).

Value and Recognition: Gabriel has experienced several highlights and successes during his years with Gothamfield. When asked to share where his contribution was most felt by the organisation, he shared the following story:

> *I think that my biggest contributions were probably during the time I spent at the caster service shop, which is the service shops job … because it allowed us to get lots of tonnes out and to substantially reduce the cost of maintenance for those parts. I was quite happy with the way that went. It was also a fun job as it involved supervising the shop. So, it was a combination of supervising and engineering, and I got to pick and choose what I wanted to do (INTFP01, L389-412).*

Gabriel welcomes new young talent and is willing to provide sufficient latitude for young employees to demonstrate their capabilities. He equates value contribution with experience: *'As much as the whole reliability thing is about keeping on top of the plant, to stop the fires starting, if in the end there is a fire … the solution really comes from the experienced people'* (INTFP01, L528-530).

Although Gabriel recognises his personal dislike for documentation, he does not impart this or allow it to influence newcomers:

> *We have had some good experiences where one of the young lads who I helped put a job together… that proved invaluable the second time we did it. That really streamlined the repair of that particular bit of plant. I was quite pleased with that actually because, in a way, at the time, it was a bit unusual for us to go to all the trouble of crossing the 't's and dotting the 'i's in the solution. We have got a history of fixing stuff and then moving on to the next little problem and not, I guess, noting our history so well. But I pushed him to do a good write up for that particular repair, and that proved to be quite invaluable for the next time round (INTFP01, L537-550).*

Gabriel values his role and considers that he contributes to an area that he likes. He enjoys working with his team. Reflecting on his time with the organisation, Gabriel explained his opinion concerning the areas where his experiences contribute the most: *'I do get the feeling to a large degree the real benefit of all these experiences that we have is to help with the solutions around the fire-fighting'* (INTFP01, L527-528). Gabriel recognises the value of intimate knowledge of the old plant, although this was not expressed as a major contribution. Gabriel knows the frequency of checks and testing, and how and when to troubleshoot.

When asked what type of experienced individual would be most suited to replace him when he leaves the organisation, Gabriel replied: *'It would be easier to get a dedicated young lad to do my job than it would be for them to do the jobs of the people that work under me'* (INTFP01, L338-339). When probed further, Gabriel said that having an experienced team is crucial. Therefore, the person who fills his position could succeed with a less technical and experienced

background because the individual can rely on the ability and experiences of the team. Gabriel was amused when asked if he felt that his replacement would readily trust the team and vice-versa:

> *Knowing the people who work for me, a much less experienced person coming in wouldn't be able to work. I can just visualise that they wouldn't trust those people. [Laugh] I just can't get a grip of that (INTFP01, L352-353).*

These comments demonstrate Gabriel's knowledge of the people, his team, and his trust and relationships with the people in the organisation. The relational aspects of management are an important part of his ability to effectively manage and troubleshoot matters with the cooperation of others.

5.1.3 KM and Support

View of the Organisation: Gabriel remarked that Gothamfield Limited lacks the vision and strategic direction to be competitive: *'I think success comes from understanding how all the bits stick together to make a good outcome. But I also think that most of us are probably quite focused in our own little bit'* (INTFP01, L214-216). Gabriel states that many employees, managers, and experts work independently, which results in a lack of integrated company knowledge. With respect to the working culture, Gabriel believes that there was a high level of creation and utilisation of knowledge at individual levels but a poor level of understanding of the correlation between jobs, which negatively affects organisational performance.

Gabriel concedes that he does not entirely understand the market position of Gothamfield Limited or its direction. Gothamfield Limited took over from Organisation X in the year 2000 and retained most of its employees. Gabriel indicates that the way in which work was conducted has not changed, and it is evident that the former culture had been retained in many ways, which he finds unsettling:

> *In terms of the culture, to some degree, to be honest, I am not really sure we really know where we stand at times culturally … we are not an old company, we have come from Organisation X and, certainly, when we first came from Organisation X, we were simply a mirror image of Organisation X culturally. We did exactly the same things in exactly the same ways. Things went OK then but changed again when the global financial crisis occurred in 2009 to 2010. So, what I am trying to say is that we have had changes, in fact, lots of changes, and I think the culture is a bit all over the shop (INTFP01, L191-201).*

Gabriel's responses imply that the company's organisational culture, and also its inability to adapt to change, negatively affects the organisation's performance.

Technology: Gabriel's role has significantly changed since the introduction of new document tracking systems. Electronic tracking systems have replaced much of the tacit knowledge that is valued by engineers. The main disadvantage is the loss of interaction and tacit exchange between engineers on their drawings that must be approved for the problems that they troubleshoot. For example, Gabriel is unable to explain 'why' some crucial measures were undertaken previously, but have not been continued. Instead the electronic system makes changes as per the configuration set by standards. Erosion in knowledge capture occurs when drawings are transmitted via the computer erasing the opportunity for the senior engineer to interact with other engineers to better understand problems and capabilities. The documentation is captured and stored in the technological system, but the critical component of why something is done in a particular way is not recorded.

Another loss that Gabriel highlighted is the documentation of problem-solving actions. Once problems are solved, employees fail to complete the associated tasks and the problem-solving actions are never documented. Failure to document problem-solving prohibits the ability of employees to learn what was done and why, which could potentially lead to other problems and concerns. Another potential problem with documentation failure is the lack of history concerning problem resolution details for future reference. With his years of wisdom, Gabriel said:

> *I think we have a culture that we don't always finish off jobs so well. I think some people call it the 80/20 rule or something like that. You get it up and running and we don't sort out the history about what was done or sort the spares out before the next problem comes along. So, with respect to finishing off our jobs, we can all be a bit lazy because things are up and running and they move on to the next (INTFP01, L570-575).*

5.1.4 Conclusion

Gabriel's 21 years of engineering experience leads him to believe that when he leaves the organisation, his specialised technical knowledge in engineering reliability function will be lost along with the trusted relationships he has formed with others and his dedication to the success of Gothamfield. He is unable to recognise his own role as a specialist, which he mentioned three times in the interview: '*I don't see myself as necessarily a specialist*' (INTFP01, L592). Gabriel does appreciate that he possesses:

> *Some good all-round abilities … a wide breadth of experiences, doing a reasonable job at a wide breadth of experience rather than a really good job at a really deep level of experience ... with dedication (INTFP01, L592-599).*

5.2 Mia

5.2.1 Authentic Expert Knowledge

Experience: Mia is 49 years old, female, and has had 32 years of service at Gothamfield Limited. She is a qualified engineer with a bachelor's degree in electrical engineering, an associate diploma in computer studies, and a graduate certificate in administrative studies. Mia started as a trainee designer and progressed to the caster and then to the rolling mills. At the time of the interview, Mia's title was 'Reliability Engineer Pallet Plant Induration'.

Titles and Positions: Mia has held eight different positions. She was one of the few women to be appointed by the electrical engineering group. Mia has held her position as Reliability Engineer Pallet Plant Induration for over 10 years. Mia comments that none of the business cards she has possessed match the formal titles that she has held. Mia looks forward to writing her position description because restructuring has caused her role to change.

5.2.2 Knowledge Contribution

Know-how: Activities, Actions, Responsibility, and Accountability: According to Mia, leadership is not just a skill, but a function of the interplay between an individual's knowledge and the organisational culture, structure, and socio-relationships within the organisation. Mia won an Excellence Award for motivating and empowering her team in what is considered a highly political environment. One example of self-motivation was evident when Mia proudly shared her *'Brag Book'* (INTFP03, L245). This book contained stories of her triumphs at Gothamfield Limited. Her stories dated back as far as 1992. One story that she shared was the following:

> *This is my favourite project to tell people about. It was at the rolling mills. I had arrived at the rolling mills. I was there for a very short time and had not even got inducted. I guess it was about six days. There are three stand pulpits that sit over the top of the roller line and the bars go through underneath and there is a stand and bars that go back and forth. It was in April 1994 when they had a case of a bar hitting the window in stand 1. I actually smashed the glass and went through the window. So, they decided that they wanted a new pulpit. It was in 1995 that they were about to commission it, but didn't end up commissioning it until November. But I was there on 12 August 1995, and the bar hit the three stands. They thought that the bars at the three stands are too long and skinny and that they won't hit the window, but it did. It hit the window and the walkway and then stopped just before the glass. So, they decided they needed to fix it. We had to build a new pulpit and I led the team to do that, which included me, the person who took care of*

production people, the person who personally supervised all the electricians, and the person who was helping me with the mechanical engineering as I am an electrical engineer. The team also included a member who looked after Transfields and another who helped with commissioning because, you know, I had been at the rolling mills for just six days. We started in August, on the 12t, and we commissioned the pulpit on the 7th of September. We had to find a pulpit, so we picked Q pulpit from the finishing end, where it wasn't used. We moved it, wired it up, and then, in a 16-hour shutdown, we cut all the cables across from the old pulpit to the new pulpit and made it work (INTFP03, L245-265).

This story demonstrates the resolution of a major issue in the record time of just four weeks. Mia's narrative focused on the various people she worked with and her project leadership. She described the project as fun, and the people whom she worked with as experienced. Although Mia speaks highly of her experienced colleagues, she believes that experienced peers can sometimes use knowledge as leverage over other colleagues. She described a personal encounter with a colleague who refused to share knowledge:

I knew that whenever there was a fault, he would sit down and go click, click, click and, in about four button strokes, he would fix it. I wanted to know what he did. He said to me, 'we got a problem here, can you just go down to the other switch room and, by the time you get back, I'll be done'. [Laughs] He didn't want to share any of his information, and he had almost organised himself. He would be a hero and he would get seven hours pay for, you know, 20 minutes work. He had set himself up to be necessary (INTFP03, L517-527).

Connections and Relationships in the Plant: Mia attributes her team success to her communication skills. Communication is her method of connecting and establishing relationships with fellow workers in the organisation:

I think communication skills are important. I was always proud to be able to talk to people at their level without using big complicated words. So I would talk like the two PLCs [3]talk to each other … it is important to express how things work in a way that's easy for other people to understand (INTFP03, L371-376).

Mia reports that communicating past decisions in regards to a particular problem, as well as decisions made in regards to a current situation, would enable the receiver of the information to

[3]Programmable logic controller (PLC) is a term known only by the employees in the organisation. This term literally refers to an industrial computer control system that continuously monitors the state of input devices and makes decisions based on a custom program to control the state of output devices. (http://www.amci.com/tutorials/tutorials-what-is-programmable-logic-controller.asp).

understand and do what is necessary. Mia states that understanding certain in-house terminologies are crucial for knowledge transfer.

Mia is proud to have worked on several major projects with Gothamfield Limited since 1983. These have included the rail plant in 1983, the combi-caster in 1990, the realignment of the blast furnace in 2004, and the building of the waste gas plant in 1999. Moreover, in 2006 and 2007, Mia was involved in a large project involving an upgrade of the pallet plant. She was working with an elite team of 60 members with a diverse range of skills and experience. Mia explained:

> *In the majority of projects, I just led the team and kept the project moving and made sure that it kept happening … it's just the knowledge of the plant that lets you know what the right thing to do is and what you can try (INTFP03, L313-317).*

Mia's successful work projects have included environmental sustainability, repair of the combi-caster, and safety excellence. The key skill that Mia relies on is her ability to unite her team and meet project timelines. According to Mia, her ability to skilfully manage teams is the reason she was selected to lead projects. Mia believes that her personal knowledge of people is the quality that earned her projects more than her knowledge and skills. Mia shares that she was the person approached to manage a fire at the blast furnace. To prove how much she was valued for this task, she relays that she received two calls from two different people with the same message, that she was needed to manage the fire. She successfully put out this fire.

To transfer her knowledge from tacit to explicit, Mia authored work instructions to help others learn from her experiences concerning work processes, which demonstrates Mia's knowledge of other roles and jobs. Mia believes that her intimate knowledge of the plant, her ability to plan effectively, prioritise, and to quickly get people back on task is crucial to crisis resolution. Mia acknowledges that she has extensive knowledge of the plant and its operations. Mia demonstrates this depth of understanding saying: *'Part of my current role involves PLC programming, and most of that is about plant knowledge…knowing the plant and how it works' (INTFP03, L225).* Mia is comfortable using technical jargon such as *'PLC programming', 'motors', 'variable speed drives', 'power distribution', 'hardwired control', 'automation', and 'operator screens'*. Her use of these terms confirms her intimate knowledge of plant operations.

Relationships and Engagement: Mia's gender creates some obstacles; however, her capability and willingness to participate in a team has earned the respect of the male engineers she works with. Mia acts as a mentor to some cadets in Gothamfield Limited and shares her knowledge with the younger generation.

Emotional Behaviours: Mia was the only female among hundreds of males when she started work in the plant, and this encouraged Mia to be strong: *'More than 15 years in operations and in maintenance there's probably only one person who has been at the pallet plant more than five years'* (INTFP03, L161-162). Mia is constantly challenged in the plant environment, considers that she has learned to survive in a male-dominated field, and has earned the respect of her male colleagues. Having experienced being a lone female among male co-workers, she is now alert to the problems facing new female engineers joining the ranks and is keen to assist them.

Continuous Experiential Learning: Mia's keen interest and passion for learning have motivated her to undertake continuous learning and to accumulate knowledge during her 32 years of work at Gothamfield Limited. Inspired by the positive outcomes she achieved through learning, Mia authored a 'Brag Book' – a book she describes accounts her successes, achievements, and how she was motivated to learn.

It was not all success that motivated Mia's learning. Mia recently faced difficulties working with the younger generation because some individuals resisted mentoring, preferring to manage their own faults and be left to their own devices. Mia elaborated:

> *I think that you need to be able to share your experience. You have got to spend some time with a new person coming in to teach them, and they have to be willing to accept that. He is interested in learning, but his only method of learning is to do it himself. (INTFP03, L540-543)*

According to Mia, the younger generation does not enjoy close supervision. This is a learning experience for Mia because she realises not everyone has the same working and learning style. She compares members of her generation to specific younger individuals who do not want to be taught. Because she is experienced, Mia values a mentor relationship. Knowledge transfer cannot happen without respect and value for the experienced individual's ability to impart insight. Also required is the expert's respect for the novice and their ability and willingness to learn.

Mia concludes that the workplace culture is male-dominated. Her experience would be valuable for organisation diversity training workshops where people of different genders can understand how best to transfer and capture knowledge. This gender bias is not new to the engineering industry in Australia. Mia's continuation and success in the organisation can be attributed to Gothamfield Limited, which has been a supportive organisation with highly skilled employees. Mia explained this by saying:

I think because Gothamfield supports education, they paid for all my education that I have done part-time. So, they paid for the six years initially that it took me to get my engineering degree. So, the fact that they support me in doing further education was part of the reason that I could do it. But the other thing is that I could reinvent myself…you know, I could decide that I didn't want to be at the rolling mills anymore, and I could go to somebody and get a new job in a different part of the plant (INTFP03, L456-463).

Value and Recognition: Gothamfield's support of Mia in her pursuit of an engineering degree has, in a way, 'bought' Mia's loyalty. She values the continued educational support that she receives, which, in turn, increases the value of her contribution.

5.2.3 KM and Support

View of the organisation: Values, Interpretations and Institutionalisation: When asked if she thinks Gothamfield Limited will miss her when she retires; Mia answered immediately: 'I don't think they will miss me.' After coaxing, Mia divulge what she considers to be the value of her 32 years of service. She responded after a long pause but with pride in her voice:

[Long pause]. It's probably more my dedicated knowledge of the place. For instance, last week, we had a down day, which was like 32 hours, and I probably worked for at least 24 of those 32 hours just making the plant going and being there (INTFP03, L427-432).

This is an attitude that is not often voiced by long-serving employees. These experts are so attached to the plant that they continue to make small improvements using their knowledge to maintain plant operations. Mia states that the organisation's investment in employee education is an honourable way to improvise processes. She says that the organisation is not innovative and attributes its competitiveness to the length of service of employees; many have been with the organisation for more than 15 years. She also acknowledges that long-serving employees were change-resistant: *'Every time a new boss starts, he wants to reorganise everything. So, the pallet plant has been one of the worst…you know, this is the third lot of changes in two and a half years'* (INTFP03, L62-65). Mia has little knowledge of the organisation's performance and presence in the mining and manufacturing worlds. This lack of knowledge is also suggested in other case studies featured in this dissertation.

Technology: During her interview, Mia spoke very little about plant technology. The only comment she made was that automation was not a large component of Gothamfield's operations. Much of the organisation's work is manual, such as the coding of drawings and documentation for integration. Mia recognises that preserving knowledge in context is important:

Every time you look at the code, there is some writing up there that says why it's like it is. So, it's preserved in context so there's no dry document that no one will ever look at. A living part of the code is the documentation about why it is like it is (INTFP03, L513-515).

5.2.4 Conclusion

Mia's continued success at the organisation can be attributed to the fact that Gothamfield Limited has been supportive and has invested in employee skills. The organisation is recognised by employees for its ability to cross-transfer skills and provides employees with growth opportunities.

5.3 Eric

5.3.1 Authentic Expert Knowledge

Experience: Eric is 49 years old, male, and holds a bachelor's degree in electrical engineering. Born in District 1, Eric joined the organisation in 1978 with no production experience. He started as one of three members in his division but, in the last three to four years, he has become part of a 40-person team, each member possessing 12 to 30 years of experience. Eric has progressed from maintenance work to operations supervision and operations management, overseeing four supervisors who are part of a 10-person team. Eric has participated in several management development programs and actively engages in mentoring and coaching at Gothamfield Limited. At the time of the interview, Eric had 34 years of service with Gothamfield.

Titles and Positions: Eric's first position was as an electrical apprentice, and he progressed through several different roles to become a tradesman, a leading hand (supervisor role), and then an electrical foreman. His job title for 13 years was 'Electrical Coordinator', which entailed the duties of an electrical foreman, electrical coordinator, and electrical supervisor. Subsequent titles included 'Shift Manager', 'Shift Team Leader', and 'Operations Specialist'. Eric exhibited a sense of fatigue with the various job titles and positions: 'Same job…just a different title.' Eric said he did not care about the titles because his position remained the same:

> *I'm accountable, and I like to involve the team. Sometimes I have to make a decision quickly and without an opportunity to engage people … sometimes, when it is urgent, it involves a safety point of view … that's only about 5% of the time (INTFP04, L51-56).*

5.3.2 Knowledge Contribution

Know-how: Activities, Actions, Responsibility, and Accountability: Eric initially managed 40 staff members. Eric currently manages four direct supervisors who, in turn, manage 10 staff members. This supervision of hands-on team maintenance was a critical change, initiated by Eric, to Gothamfield's industry. The industry is susceptible to accidents or even fatalities, and safety is of paramount importance to the organisation. Eric takes his work seriously and engages in any change that encourages safety. Eric states: *'It's extremely critical; safety is number one, everything we do has got to be done safely' (INTFP04, L140).*

Eric exudes pride in his core team function, which is to ensure that daily production objectives are met, and recognises that this affects the organisation's bottom line and the customers' needs. He says: *'If I don't get it, if my shift is not productive, our customers won't get their products'*

(INTFP04, L171-172). Eric also manages production cost rates and customer needs: *'You've got those three married together; cost, safety, and production, and your business is not strong unless you've got all three. Not having one of them can put you out of business'* (INTFP04, L145-146). Overall, Eric believes he is part of a team and spends 95% of his time with the group.

Eric's attitude to precision and timeliness cannot be achieved unless people are managed the 'right' way. He believes in tough discipline for underperformers:

> *I know that people respect my management style. I've even had people thank me when I put them on final warning and told them they were about to lose their job because they understand that the way I go about it is not, they understand where I'm coming from, and why that is the way it is. I think people respect the way I manage them (INTFP04, L205-208).*

Undeterred by the complexity of the production process, Eric states: 'There are a lot of things you need to learn on how a process runs and why you do what you do' (INTFP04, L230).

Relationships and Engagement: Eric values connections among individuals, as well as empowering individuals. He appears to believe that the relevant knowledge and people skills within a business can form a link between the experienced worker and the team. Eric also appears to believe in the importance of building competency and motivating people through rapport, which he describes as *'how to interact with people and get the best result from them'* (*INTFP04, L452-453).*

Eric believes that relationships are complex. Learning about people and building familiarity creates and strengthens relationships. Robust workplace relationships galvanise interactions and individual engagement with jobs. Eric earned the trust of his employees to encourage smooth team dynamics.

Eric claims that he is adept with people and enthusiastic about building relationships. Eric is driven to care for his co-workers more than Gothamfield Limited itself. Eric enjoys making new acquaintances and understands individual idiosyncrasies. Therefore, Eric has an acquired ability to manage people and foster organisational learning. Eric states that few people are willing to become acquainted with the people they manage and, consequently, do not manage people effectively.

Emotional Behaviours: Eric says that performance is a product of *'people management'*. Expert subject knowledge is only effective when particular attention is paid to the social ties,

relations, and trust within the respective team in addition to the systems and processes. He says: *'I reckon my main strength is that I'm a people manager, and I have the people skills to make sure we make the product'* (INTFP04, L122). An essential trait in effective people managers is emotional intelligence:

> *Not to personalise things every time you need to get something done…How you talk to people is extremely important … people personalise things, they are fearful of certain interactions and they take that fear with them (INTFP04, L460-462).*

Eric is creative and innovative, particularly during periods of stagnation in the supervisory levels. His opinion concerning the emotional behaviours of his supervisors is that there is room for improvement. Eric considers that the organisation's productivity will increase if attention is paid to these emotional skills:

> *If I could just teach supervisors to behave in a different way in that regard I think. If we had 90% of our supervisors able to do that instead of about 10% ... I think our productivity would be a lot higher than it is now (INTFP04, L466-470).*

Continuous Experiential Learning: Eric has completed several management development programs while at Gothamfield. His favourite course was one that discussed coaching and was led by a psychologist. Eric says that he draws on this learning experience in the course of his daily work. Another influence that Eric claims is responsible for his performance is his wife, who teaches meditation and stress relief. Eric considers his people management skills to be his greatest contribution to the organisation:

> *Probably easier to learn the production than it is to learn about people… we've all got our set styles and we can all learn, I understand that … I think it would be a lot easier to teach someone how to produce steel, if they haven't learnt the people management style they probably wouldn't get the job in the first place (INTFP04, L162-166).*

Eric earnestly believes in learning and transferring knowledge. He reflected on his own experience with mentors during his early years at Gothamfield: *'It's new knowledge on how they should manage certain situations ... I've been very fortunately exposed to some very good people'* (INTFP04, L131-134).

Eric has spent seven years understanding the organisation's processes:

> *Well, I started this role seven years ago… I had no process knowledge at all, and the major learning for me was to learn the process knowledge. To get involved and learn as much as I can about how the process works (INTFP04, L289-290).*

Once he consolidated his process knowledge, Eric decided that the one key skill that he required was people management. For the subsequent eight years, Eric focused on the *'people management side of things through from about 1991 to the year 1998' (INTFP04, L292-293).* Eric believes that the art of management lies in understanding the thought patterns of the people who work for and with you, which requires knowledge of their traditions and values. Eric says that in his current position, he values the following: *'Teaching people how to manage others and how to think. Why people think the way they think'* (INTFP04, L138-139). This demonstrates Eric's ability to work alongside the individual and build a relationship, which results in a motivated employee who performs efficiently and productively. Eric's team is willing to learn and work with him because they identify with the organisation. This identification can be a significant motivator because individuals who closely identify themselves with their employer are likely to assume a wide range of work challenges.

Value and Recognition: Eric describes himself as responsible, respectful, and totally committed to his job; even a fractured leg did not deter him from going to work. Although Eric considers himself to be just another employee, he is dedicated to the company and demonstrates this sentiment through his connections and loyalty.

In terms of outcomes, Eric's 'perfectionist mentality' soon becomes apparent. As he says:

> *We make something like 19 different products … I'll use an example. If you said to me web off centre is extremely important to me, there's an allowance for that, and I can make adjustments to the process to make web off centre more accurate than it needs to be, it's sellable in a certain tolerance … there are about six or seven tolerances for each bar, but if I know that if this guy is going to use this product for this then I can work, I can make adjustment for that, each thing. I think it's a better product; it's more suitable for him (INTFP04, L258-271).*

Like many of his colleagues, Eric tends to dismiss the various titles that he has held claiming that it is the management's way of expressing their perspective. He is proud that his immediate superior recognised his leadership qualities (particularly in regards to safety) from the outset. Eric believes that knowledge is valuable to the organisation when it relates to the organisation's competitive position and that critical measures are safety and culture, *'Safety is definitely number one' (INTFP04, L141).*His explanation demonstrates how motivation and influence from an individual can be aligned to organisational values to create a community of practice:

> *I reckon my main strength is that I'm a people manager, and I have the people skills … I have my experience in coaching … my job is to coach them and mentor them and keep an*

eye on the process and make sure we are making steel within specifications and making the right amount of steel, producing at a fast enough rate and a good enough quality (INTFP04, L122-128).

He describes his strengths concerning production knowledge, people management, and ensuring internal collaboration between divisions to achieve knowledge exchange. Most of his knowledge exchange occurs in a conversation style. He believes this connection is a critical contribution to the organisation's business performance:

I'll have a meeting half an hour into the shift at 7:30 whether it be 7:30 in the morning or 7:30 at night, because we do 12 hour shifts 7:00 to 7:00. Give these guys a chance to go set their workforce up, and we have a meeting, and I discuss with them what production is expected from us for the rest of that shift. I will invite two maintenance people along to that meeting to see whether they have got any issues with the plant that is going to hold our production up. So, we discuss everything that's going to happen in the next 12 hours while we are at work and what we are going to do to make sure we meet our targets for that day. And at that stage, we will discuss safety and our production expectations (INTFP04, L149-156).

A story Eric shares with newcomers is fuelled by his passion and interest in people management:

I would describe my role to people depending on what motivates you, if you like working with people. I believe I've influenced a lot of people in a lot of different ways. I could talk about some of the improvements on certain individuals and getting them to become better team members and more productive in the workforce. Certainly, with one bloke who my manager wanted to sack because he had a bad back, but I was able to talk to that bloke, get an understanding of his restrictions, and let him know what I needed from him, and he is now a far more productive member of the team. He doesn't hardly have any more time off; he does more at work than he ever used to. Because I built a relationship with him, I have an understanding of what his capabilities are, what his restrictions are. I get him to work well within those and I believe I've motivated him to come to work. Most of my issues would be around people, I reckon. I seem to attract … all the difficult people, I get sent the people that are seen to be…what's the right word for it? Difficult to manage? I am able to build relationships with these people, make them understand, make them more productive, and teach them some skills and how to go about their daily work where it isn't quite as aggressive towards other team members, I think. For some reason, I get sent all the difficult people for that reason (INTFP04, L388-403).

5.3.3 KM and Support

Organisation and Organisational Improvement: Eric's perceptions are balanced as he discusses improvements the company could introduce to customer service, customised products, and the preservation of documented processes as organisational assets.

Eric, along with some of his colleagues, has been critical of the recent restructuring which involved many engineers being moved into management or administrative positions. Eric believes the organisation has made a costly mistake through their downsizing measures:

> *This business went through a period where it didn't employ any people. For quite some time, we were downsizing, and there were no new faces coming in this gate from the time we got spun out in 1999 for about six or seven years, and we were reducing our numbers and people. If people retired, we didn't replace them. So, it's only in the last…the last three or four years we started employing people … they would all have between 12 and 30 years' experience in the business. So, most people are over 40 … If a bunch of them won Cross Lotto, it would be a major problem for me (INTFP04, L324-330).*

Eric does not believe that part of his crew's job is to share knowledge because they are engaged in controlled precision operations and do not have time to engage in creative outcomes. Substantiating this conviction, he explains:

> *There's a lot more opportunity to do it in maintenance. The maintenance crew is not in the process line, and you can sort of do what you need to and sort of take your time and get things right. The operators are in the line, making steel, and if I stop them for those sorts of things then we don't produce steel, so it makes it hard (INTFP04, L60-63).*

Eric expresses some concern for the replacement of the retiring workforce due to the difficulties in finding replacements with appropriate knowledge and skills. The organisation has downsized its workforce on a regular basis, and this, Eric suggests, causes knowledge loss. Additionally, Eric is currently overstretched with a small number of employees. Therefore, it has become relatively difficult to run the plant. Although some sections of the plant are automated, problems occur. Eric has attempted to train his teams on automation but admits that there are problems in doing so:

> *In the good old days, we had more people than we needed, and that's not the case anymore. We are as thin as we can go. We've automated the plant and we've done away with a lot of manual tasks, which is a good thing, but it exposes you to the point of view you just talked about (INTFP04, L336-344).*

Employee turnover can affect organisational performance, according to Eric. The departure of one or two employees is manageable. If the number of departing employees surpasses two, however, retraining new hires will be difficult. Eric is alarmed by recent developments because there are five people regularly absent during work days. He perceives that this has an impact on organisational performance. Eric considers the organisation to be reactive rather than proactive in its business approach and to be lacking in innovation. Eric also believes that the organisation requires new knowledge, particularly for people management. Organisational culture must be considered if a knowledge initiative is to be suggested for Gothamfield Limited. Organisational culture can impact organisational performance and must correspond to what is happening within and outside the organisation. Organisational culture plays a critical role in creating, sharing, and transferring knowledge in a systemic manner. Eric considers the culture a barrier to performance, commenting: *'There is a fairly strong culture, which is quite hard to change at times'* (INTFP04, L102-104). Eric elaborates on this by saying that the culture has positive and negative aspects:

> *It's negative sometimes. It's positive from the fact that they are well-trained and they know their roles, but it's negative from the point of view that if you want to change certain things or certain behaviours, it is very difficult to do (INTFP04, L107-108).*

Eric considers that keeping production operations fully functional mitigates the risk of loss, and he deems this mitigation of loss as being important. He admits that neither he nor his team engage in highly-creative brainstorming for innovation, but considers his work important and recognises that different plant work invites creative innovation.

Like many others interviewed for this dissertation, Eric did not mention technology or provide any description of systems. He affirmed that the organisation is totally reliant on the individual who has knowledge of customer requirements and specifications and who knows the variations.

Technology: Eric only mentions computer skills as an important technological component of any role: *'You can learn the process and you got to have basic computer skills which is the same for everyone nowadays'* (INTFP04, L232-233).

5.3.4 Conclusion

Eric has a clear understanding of his contribution to the organisation, as Gothamfield differentiates itself by customising products. He demonstrates recognition of his value when he says:

> *Well, my job is to make sure on a daily basis I get the right production, so that affects the bottom line and it affects our customer needs. If I don't, if my shift is not productive, our customer won't get the product (INTFP04, L170-172).*

Eric adds: *'I like working with people, and I like influencing other people'* (INTFP04, L179). Eric seems to be a person who likes to influence people with an effective, organised management style. His narrative suggests that knowledge rejuvenation is vital for the organisation's survival and performance.

5.4 Roberto

5.4.1 Authentic Expert Knowledge

Experience: Roberto is 49 years old, male, and born and raised in District 1. He is a qualified metallurgist and holds a bachelor's degree in operations management and engineering manufacturing. He is also a qualified Six Sigma Black Belt. He started as a trainee and is now an operations manager, leads a team, and works with them on occasions.

Titles and Positions: Roberto's entire 32-year career has been with Gothamfield, and he considers it a privilege: *'I like my job and I've had plenty of chances to do different stuff'* (INTFP05, L49). He has held approximately eight roles during his working life and five in the last 10 years. He started as a trainee and moved into various positions such as shift foreman, relief positions, store supervisor, operations engineer, crushing and screening superintendent, and, finally, operations manager. Roberto's longest role lasted nine years as a refractory technologist. Roberto holds several qualifications: an Advanced Certificate in Metallurgy, a degree in Operations Management, and an engineering degree with a concentration in engineering manufacturing. Roberto's formula for rotation in the organisation is the desire for a challenge and ensuring that he becomes 'redundant' in jobs that he assumes.

5.4.2 Knowledge Contribution

Know-how: Activities, Actions, Responsibility, and Accountability: Roberto states that his job is complex and requires technical knowledge and the ability to apply that knowledge appropriately. His strengths lie in process and people management and innovation aligned with the existing plant and equipment. Roberto's intimate knowledge of plant operations and the repair and maintenance of equipment over the years has improved efficiency in the organisation:

> *The first repair we did was an 80 course repair, and normally that 80 course repair would have taken 24 days, and we went through and did some rough times – because we had never done it before – and, allowing for new people and that, we said it would probably take us 16 days to do the work, which was still eight days better than what we had done previously. We got in there, and at the end of the ninth day we were finished. So, we virtually got from 24 days to nine days for this particular repair and everyone was just amazed (INTFP05, L702-708).*

One of Roberto's key strengths is process-orientation, which involves an extensive knowledge of how things are done to achieve an overall satisfactory outcome in the integrated chain of

manufacturing. Roberto states that he is probably the only member of staff remaining in the pallet plant with integrated knowledge of the whole plant from inception to final product:

> *I can't think of anyone else that has worked in the blast furnace, coke ovens, palletising, steel making, and steel products – that's from a material point of view – and as project manager in all areas of the plant. So I would say I'm the only one that has an overall view having worked in all the areas in a number of disciplines and having worked as a service provider to each of those groups. I think the value in that is that I can actually understand how it all fits together and then explain that to people who struggle to understand. I think that's probably the biggest value and asset that I can deliver to the organisation. I'm not siloed (INTFP05, L600-607).*

Roberto explains that he applies anticipatory thinking. This anticipatory thinking enables him to detect problems and patterns that match his past problem-solving experiences at the local end and meeting organisational strategic objectives. He adopts a strategically aligned approach and expects every employee to be similarly aligned with the organisation's values and strategic intent: *'If you're not doing what is required. I will tell you what you need to do'* (INTFP05, L508-509). Like many of the Gothamfield employees, Roberto values the safety culture. He claims that he has stopped plant operations to emphasise the message that safety is critical:

> *It certainly showed me that we can't underestimate the plant, and you need to accept that this is a dangerous plant. It is only as safe as we make it, and how safe we make it is up to us. I think sometimes people don't fully appreciate that. Safety is one of our core values, and I have stopped the plant rather than put people at risk and I will do it again, and I will bear the consequences of that before I put people at risk (INTFP05, L774-779).*

Motivated and influenced by his own appetite for learning and contributing to the organisation's strategy, Roberto says that the way to encourage learning and to motivate staff is to adopt the organisation's perspective, act in accordance with the organisation's goals, and challenge employees. The participants in this study show that they are individually inspired to teach and share their knowledge. As he states:

> *For example, I'm working with a guy at the moment, and I think he's got a lot of potential but he tends to roll along and he doesn't challenge enough. My focus with him is to get him to challenge others, and I'm trying to show him how to challenge because there's a right way and a wrong way to do it. You can do it in a threatening way, in which case you'll get no result, or you can do it in a learning way and get good results. In his*

situation, it's about challenging and then giving him exposure and experience to do other things. Some of the simple things can make a difference (INTFP05, L541-552).

Roberto believes that to teach an individual is to empower them and support them through the risks they may encounter.

We were interviewing for a position and I said, 'I want you to do the interviews, I'll follow your recommendation, and we'll employ that person'. So, all of a sudden he has gone from a position of very little respect to a position where, 'I've actually got say and influence and respect … and I'm actually part of the bigger picture'. So, I can't say it's one or the other; you've really got to look at the individual (INTFP05, L541-552).

Roberto explained that he adopts the organisation's vision and core values as his guiding principles. He acknowledges that the improvements in his job performance can be attributed to the power of learning from experience and the extensive use of his experience for adaptation. His experience enables him to evaluate and improvise. Recently, he had taken on some administration that required additional learning.

Relationships and Engagement: Roberto is one of many ensconced within District 1 and Gothamfield Limited and who considers the organisation akin to family. Relationships rarely change among Gothamfield Limited employees as they switch from the work and home environment. Employees are colleagues but also friends and relatives who live in a close-knit family and work environment. Roberto states: *'I value the friendships that I've got from those people over the years and many of those I am still friends with both in and out of work'* (INTFP05, L579-580). As a life-long community member, Roberto is sensitive to concerns within the community while expertly communicating company information. Roberto experiences job satisfaction because he feels acknowledged and recognised for the care and concern he has shown for the community:

I did something last year and I received a fair bit of feedback from it, and it was something for me that I did that was insignificant, but it had a flow-on effect that I didn't expect. We haven't had a very good rapport with the community around the environment ... Anyway, we had two particular people in the community who were very diligent and watching what we were doing … and I was up on [Hill] one day and this guy was up there – and I knew who this guy was – and I walked over and said, 'How are you doing?' He was quite abrupt and rude and I thought, 'Well, this isn't going well', so, I started again and said, 'My name is Roberto, and I'm with the pallet plant, an operations manager. I know you've kept an eye on it. Is there anything here that you think is

untoward that we need to address?' I only had a five-minute chat with him, and it was all very cordial, and then I left. The next thing, he sent a letter to the CEO and the EPA[4] *saying that it was really good to see that after all these years of work people are actually starting to interact and talk and, clearly, what we have been doing over the years has finally come to a point where we've evolved to do this. I thought, 'Well, this is pretty good' (INTFP05, L718-737).*

Emotional Behaviours: Roberto sees himself as energetic, witty and pragmatic, all important characteristics for peer engagement at Gothamfield. He considers that his years of learning must be passed onto newcomers: *'The four most satisfying things that I have had in my career have centred around people'* (INTFP05, L501-502). Roberto shared examples of staff teams that he has mentored and, as he puts it, '*turned around'* (INTFP05, L420). He describes the following example as one of the most satisfying times working at Gothamfield:

For me, personally, just the fact that I was able to take someone that had a skill set and then develop them to a point where they became very marketable, and they grew as a result of that, and then to have them come back and recognise that and say, 'Thanks'. Those things are probably the things that I get the most out of (INTFP05, L434-438).

Roberto refers to his strong character and high level of passion for challenge: *'One of the things about my character is don't tell me I can't do it and don't tell me it won't work because I ... will make sure it does*' (INTFP05, L698-700). Roberto attempts to inspire and influence with instinctual loyalty and a commitment to employees and future generations. With a rush of emotions, Roberto took a deep breath and said: '*I can't leave because I don't have anyone that has the best interests of the people and the plant ... That's what it is – you have the best interests of the people who are on the plant as well'* (INTFP05, L632-634).

Roberto wishes to make a difference in the organisation by passing on knowledge and teaching. He describes an example where he felt that he made such a difference. In this example, Roberto was able to transform an employee who had been slated for dismissal for poor performance: *'Three months later, I had turned him around, and six months later the same management group said, 'We're amazed. We're happy to keep him in the business now'* (INTFP05, L504-506). Roberto explained that his teaching is intensive:

I was just pretty straight up with him. I said, 'You're not doing what is required. I will tell you what you need to do'. I was very descriptive and said, 'You will do this, this, and this… you need to develop your own skill set', and he took it on board. I spent a lot of

[4] EPA is an acronym for 'Environment Protection Authority'.

time with him … He was getting good feedback … within six months we were able to turn him around, and he ended up in the role that he wanted (INTFP05, L508-525).

Continuous Experiential Learning: Roberto's dedication and commitment to Gothamfield is demonstrated by his constant adaptive situated learning. He is the only employee who has successfully transferred his knowledge, skills, and experience across the company's various divisions, units, and plants. Adaptive learning is based on high-intellect learning where Roberto applies his past experiences to understand the causal structure of events; his anticipatory thinking assists him in adapting. This type of learning is likely to take less time, and the expert is likely to replicate alternative choices based on accumulated experience. This ability would, potentially, be lost if Roberto is replaced by someone who does not have his extensive plant experience. Roberto likes to determine the root of a problem as soon as it occurs. Although he may already suspect the cause of the problem, he will still seek feedback from the affected parties and hear their perspectives in order to avoid missing important points and to confirm his understanding of the problem. At the time of the interview, in his role as pallet plant operations manager, Roberto admits that he is still learning despite all his years of work at Gothamfield Limited:

I'm only very new to this current role, whereas, in the previous role, I was in for two or three years. In my current role, I'm still learning. So, if we have an issue, I tend to go off and try and understand what the issue is – mainly because, when I go and talk to the guys, I like to understand what they are talking about. It's just the way I work. Even though I know the answer, I like the guys to explain it to me so that they feel that they are helping me learn, but I also don't like not knowing (INTFP05, L77-85).

Roberto believes substantial knowledge can be transferred; however, he also believes that knowledge comes with experience:

Personally, I think when you can start to see how that skill set is able to be transferred to your new role, that's when you're operating at a higher level. So I'd say probably all of it – apart from the technical knowledge of the pallet plant – would be transferrable; how to get people working, how to get people engaged, how to challenge people, how to talk, how to interact - all that comes into it, but then how to sit down and actually analyse the information and then interpret that information so that when you look at a graph … I'm trying to teach that to my kids at the moment – when you look at a graph, it's not a series of lines – it is telling you a story, and you've just got to understand what that story is, and that's very hard to teach. Those skills that you learn when you progress through your working career (INTFP05, L508-525).

Knowledge and learning play a central role in Roberto's interactions with his peers and his juniors. He takes the time to understand how he can transfer knowledge and how it can be activated in others. Roberto is persistent in his drive and commitment to understand where an individual requires skills development and how that skills development can be provided.

Value and Recognition: Roberto values the opportunities given to him within the organisation:

> *I value the fact that I'm in an organisation that has provided me with employment for as long as it has. I value the fact that there are certain people out there who have at least given me an opportunity to progress and grow (INTFP05, L587-595).*

Roberto relates a story of success and organisational achievement for which his team won an award. The story emphasises expert focus on a problem to understand the situation, an appreciation of the level of the problem facing the organisation to solve it and, at the same time, an attempt to collaborate with the team. This is a story Roberto shares with incoming workers:

> *Probably the biggest one was one we used to have on the pallet plant ... They've got a kiln, and it's about 5.6 metres in diameter, which is a reasonable size kiln, and inside is full of bricks. With the bricks, every now and then you have to get in and demolish them, and the process that we used to have was we'd have a little doorway smaller than that, and there was a gap that you had to walk across. You'd put a little bridge in, and the bridge wasn't much wider than my leg— very narrow— and the drop below the bridge was five or six metres. Then, when you got to the other side, you had all these bricks, but you'd have to demolish the bricks. The process was that you'd open this little door, put this little bridge in, walk across, then start loading scaffolding piece-by-piece. You'd build the scaffold – it's called a protection scaffold – and then you'd pull some out, and then you'd get out of the way, and you'd demolish, and all the bricks would fall down, and then you'd have to pull all the scaffold down and hand all the pieces out through this little door, and then they'd have to get the bricks and manhandle the bricks down in wheelbarrows – well, you couldn't even get a wheelbarrow in actually – you'd have to manhandle the bricks down into the hopper, and once you got all the bricks out, you'd have to put the bricking rig in… a big old rig is the only way to describe it. You'd have to hand this in through this little door, and you'd basically have to build it, and you'd have a little series of conveyors, and you'd put the conveyors on, and that would run the bricks, and there'd be a guy standing handing the bricks from one conveyor to the other. It used to take them a long time, and then you'd have to pull it all down, take it all out and it was very, very time consuming.*

A guy called Peter Page – I said to Peter one day, 'Let's open the front of this kiln up and let's make two big doors that we can at least drive a bobcat in,' and Peter went, 'Yes, we could,' and then we said to another guy, 'We're going to open the doors up', and he said, 'Well, if you do that, I'll make you a bridge,' so I thought 'Beauty!' So, all of a sudden, we've gone from this little thing to opening up the doors as big as we can, and we got the bridge. I said, 'That's good.' Well, let's get the bridge big enough and strong enough so that we can drive the bobcat in, and they said, 'Well, that works.' It was all ideas and starting to happen and I said, 'Well, this big rig we've got is not much chop, let's try and get some capital,' so we got some capital money and brought this rig, which was an aluminium rig as opposed to steel and, instead of being in about 500 pieces, it was in about 20 sections. So we ended up with the doors opened up, the bridge in, the bobcat that could cart stuff in, the stuff put onto small pallets, but before all that happened I'd put the whole thing together as a proposal, and I took it to the lead team that was here at the time and said, 'This is what the plan is. This is what I'm going to do, and these are the people involved.' We sat in there and, after the meeting, two of the guys caught me after and said, 'It won't work. You're wasting your time; it won't work.'One of the things about my character is don't tell me I can't do it. And don't tell me it won't work because I … will make sure it does. They didn't know that about my character, but, anyway. So we went off, and we got the design for the doors and the bridge, and a friend of mine got sorted out with the bobcat, and we did everything…What started as a 'let's open the doors' had evolved into something … And we still do it today, and the people that come in now think that's the norm, and they forget the days of having to go through a little door. (INTFP05, L663-711)

Roberto particularly wishes to share this story because the newcomers to the organisation are not aware of the difficulties in squeezing through the 'little door' that led to enormous improvements.

When asked how he would have been valued by the organisation, Roberto replied in terms of his experience as overall project manager in all areas of the plant:

I can actually understand how it all fits together and then explain that to people who struggle to understand. I think that's probably the biggest value and asset that I can deliver to the organisation. I'm not siloed (INTFP05, L596-607).

Roberto suggests his biggest contribution is his communication and interaction with staff and his sharing of knowledge:

> *I think the value is that I can actually understand how it all fits together and then explain that to people who struggle to understand. I think that's probably the biggest value and asset that I can deliver to the organisation (INTFP05, L605-607).*

Roberto describes his learning process and how he is perceived by others in the following terms:

> *For example, this morning I had a guy come and see me about that line kiln, and I haven't been down in the line kiln or refractories for a couple of years, but because we have lost so much expertise in that area, I think I'm the last— there's actually a photo on the wall of the technical people, and I'm the last of the true technical people that we have had on plant for the last … I'm probably the last one that is still on plant so people still come up and ask me questions. We were in the process of rebuilding and reengaging and redeveloping those people, but we should never have lost it in the first place. I know from my own experience, the way that I learnt was the fact that I have all these people around me that had a wealth of knowledge; Mitch, Ted, Mike, Phil, and Joe— people with loads of experience. Then, having been exposed to people over in the eastern states that had other technical expertise; Peter, Morgan, and Stanley*[5] *— we don't have any of that now (INTFP05, L610-621).*

Roberto's biggest asset is that he is the only individual who has worked in all divisions in Gothamfield Limited, and has utilised a number of management skills in rebuilding. He is, therefore, unique and difficult to replace because of his comprehensive knowledge of plant operations. If he leaves, the company will lose this integrated knowledge. Roberto recognises that his knowledge contribution will be the organisation's greatest loss in the event of his departure. The organisation has obviously learned to manage knowledge loss and gain, to some extent, from the departures of other employees; however, Roberto believes that his quick reflexive thinking will be missed: *'Probably, just the experience that you've got – you can only impart so much of that. I think probably the thing that would be missed is the experience'* (INTFP05, L787-790).

Roberto says that when the time comes that he decides to leave the organisation, he will share that decision with his team and other employees. He claims that he has already achieved so much professionally, and there might come a time when he does not need to achieve anything more in his life. He shares this information to motivate others to learn. He is pragmatic, and when asked whether Gothamfield Limited will miss him when he retires, he responded that he is one of many. This is probably a reflection of events that took place during the 1980s, when the

[5] All the names in this quote have been changed to maintain confidentiality.

organisation experienced a financial crisis and many employees left. Roberto recognises the value of his contribution to the organisation but also states: *'We are just a resource. I think, as you get older, people – if they know you–accept that you do have knowledge of the plant and the history. It's very cyclical around jobs availability'* (INTFP05, L284-290).

5.4.3 KM and Support

Organisation and Organisational Improvement: Roberto holds Gothamfield in high regard:

> *I value the fact that I'm in an organisation that has provided me with employment for as long as it has. I value the fact that there are certain people out there that have…given me an opportunity to progress and grow (INTFP05, L583-595).*

Roberto considers that Gothamfield's downsizing changed some dynamics and encouraged closer collaboration between employees: He says: *'We had the downturn in the industry, a lot of people losing their roles, and so there was a lot more discussion and involvement working with people'* (INTFP05, L65-66). Roberto also says:

> *Mr X – he gave me probably the single biggest opportunity, and that was when I moved into this level in the organisation, and that was a big thing for me. A guy I used to work with wasn't known for his diplomacy, but from him I did learn diplomacy, but I also learnt to be very direct and very specific and be very clear about what you are saying. It's very hard to single one thing out, I think there are a variety of things (INTFP05, L583-595).*

Knowledge sharing is unique within family-type cultures. Knowledge may be lost with the departing expert and, to continue at this level, the replacement employee must understand connectivity in order to share and transfer knowledge. Roberto is deeply concerned with the continuity of Gothamfield Limited and is questioning the various ways in which knowledge can be bought and retained by the younger and newer workforce. He sees motivating and challenging people as the best way to engage with members and transfer knowledge: *'Apart from the technical knowledge of the pallet plant – which is transferrable; how to get people working, how to get people engaged, how to challenge people'* (INTFP05, L129-130).

Roberto shares his perspective on retention, specifically, with respect to the younger generation:

> *I think the fact that we have an older workforce— not older as in age, but certainly older as in people who stay on longer— puts us in a position where we have lots of experience and expertise. What we are not good at is keeping the newer Generation X, Generation Y,*

boomers, or whatever generation of people. Again … how do you keep those people in the business? A model that I looked at with one of the managers I was recently with was when you start your working career; your focus is all on money (INTFP05, L290-296).

When asked how he perceived Gothamfield's performance, Roberto said:

I believe that the people who are around and I'm talking right across the board now and not about general management, know that if they pull that lever or push that button, that this will be the result and that's their job. I believe that there are people that have an understanding of their department— maintenance, operations, technology, or whatever it happens to be and I believe that there is the next level up where there are people who have a view about how their whole department runs and then, obviously, you go up to the next level. I think, depending on where you are in the organisation, you have a focus on your specific area. The guy that sits in the pull pit, he really doesn't care about whether we are making money or not as long as he gets his pay packet at the end of the fortnight, whereas someone like our CEO, he does care about what happens from day to day and has to focus on the longer term because, obviously, that's his specialty. I don't believe that people within the organisation overall believe that their contribution is all-embracing; it just depends on their focus at the time (INTFP05, L319-332).

Employees, including Roberto, do not seem aware of exactly how their performance and contribution on a daily basis affects the organisation and, at the same time, appreciate that each individual engaged by the organisation has a specific contribution to the organisation's success. Thus, knowledge in action could become core rigidity instead of a core competency.

Roberto discusses several critical aspects of knowledge sharing, transferring, and creating learning spaces. Roberto's wisdom is based on years of experience in the operating culture of workers units, the relationships he forms, and the critical knowledge that the organisation must retain.

Technology: Gothamfield's machinery and equipment date back to the early 1980s. Minimal technology has infiltrated the organisation since then. The employees are accustomed to traditional manual processes, and automation is not a component of the organisation's labour orientation. Roberto explains his perspective on technology at Gothamfield:

If you look at a recent incident with the blast furnace, the way that we responded to the customer and the situation was very good. We recognised very early that we were going to be short, and there were negotiations with some other companies to supply us with some raw product so that we could deliver an end product. I think they responded really

well to that one. If you look at the time when the blast furnace was in difficulty, I think there was some technology out there that was proven elsewhere but, unfortunately, it didn't work for us. We acted very early and got it in, and at least we were in a position to try it (INTFP05, L188-195).

Roberto discusses how technology has revolutionised the workplace:

There were no computers. We used to have calculators and the old dot matrix printer and an old mainframe computer that sat downstairs. There was a little bit of PLC stuff but there was a lot of hands-on manual calculations, and that's obviously grown and developed over the years, and that's certainly something that has evolved as I've gone through my work, which has been good because through my working career I have evolved with computers (INTFP05, L372-377).

Roberto's response complements the response provided by Mia. According to Mia, automation is a significant cause of turnover, which has reduced the workforce. Roberto values his team and colleagues, and this could explain why new technologies have not proven successful.

5.4.4 Conclusion

Despite integrated knowledge and an understanding of the need to transfer knowledge through motivation and challenges, Roberto believes that Gothamfield will not miss him:

We're very good at reinventing the wheel, and I think it's the fact that we don't need to that sometimes catches us out … Look, it probably would have worked if we'd done this ... But, generally, it's very hard because there's always someone that wants to pick up the slack and progress themselves (INTFP05, L800-810).

The message that he wishes to pass to the new generation of employees is to develop the ability and eagerness to question the 'why' in everything, for example:

Why did you do that? It worked before that way, why did we do this? Why did we change the confined space over? Well, we're not complying with the codes of practice and the legislation, so we need to change that (INTFP05, L646-647).

A learning experience that Roberto wishes to convey is the danger that exists in the plant-based on his horrific experience[6] in December 1997. Referring to that day, Roberto states: *'It is only as safe as we make it, and how safe we make it is up to us'* (INTFP05, L775).

[6] Roberto explained that this involved a huge fire that broke out in the blast furnace and whilst trying to put out the fire, one of his team members was severely burnt and which led to a death situation.

5.5 David

5.5.1 Authentic Expert Knowledge

Experience: David is 56 years old, male, and has 41 years of service with Gothamfield Limited. He was born in Belfast, Northern Ireland, but has lived in District 1 since he was 10 years old. David holds dual bachelor's degrees in mechanical engineering and business management. He was one of 300 apprentices that the organisation hired. The apprenticeship was the first step in his career because the organisation provided him the opportunity to study at the Institute of Technology, the only institute to offer a certificate in mechanical engineering. David was proud to have been selected for this exclusive course, and he successfully earned certification in mechanical engineering and management.

David started with Gothamfield Limited as a trainee and, at the time of the interview, was six months into his role as senior operations manager. His role encompasses many functions that are individually driven, but that also require him to work across groups with his operations team. David did not envisage undertaking this senior management role, saying: *'When I first started, if somebody had said you'll be a manager in product making one day, I would say, yeah, right, you have got a hole in your head. I'll never end up there'* (INTFP07, L140-144).

Titles and positions: David started as an apprentice in motor mechanics, and when asked how many roles he has assumed, he replied: '*Oh, countless'* (INTFP07, L140). He displays energy and enthusiasm when discussing these roles:

> *That's why I am still here because the opportunities were there in this business; it doesn't feel like I have worked for the one employer all my life, but I have. It's because I have been able to move around and have different roles and grow and work through a career (INTFP07, L140-142).*

In the last 10 years, David has held three different positions, and his longest role was as caster operations manager for approximately six to seven years. At the time of the interview, David held the position of senior operations manager overseeing several managers and over 300 people. He feels that he has grown with the organisation and seized opportunities to fulfil his interest and passion. David has willingly and enthusiastically taken on additional roles because he believes that this will lead to self-improvement and promotion. David considers that his experiences have allowed him to grow with the company.

5.5.2 Knowledge Contribution

Know-how: Activities, Actions, Responsibility, and Accountability: David is a long-standing employee who embraces the structure and culture of the knowledge process. David believes that the philosophy and responsibility of each Gothamfield employee should be to *'do it right'*, and that this should translate to the customer experience:

> *Well, getting the right product to the right customer at the right time is what we talk about with the 3Ts in steel making; it's the right time, right temperature, and right treatment. So, it's the same sort of philosophy that you can carry on with your customer. If they order something, and they want it at the right time, the right quality and the right price are sort of the outcomes that you need to have (INTFP07, L682-685).*

David's experience in managing contracts has provided an appropriate level of analysis to ensure cost benefit and value for the organisation. Referring to decisions based on the organisation's internal and external relationships and resources, he states simply: *'You need to understand the value'* (INTFP07, L668).

Only six months into this role, David humbly recognises that he is still learning despite his 30 years of experience with the organisation. He claims that his responsibility is to understand the key skills required for this position. He is confident, however, with no hesitation and an overall perspective that his major function as operations manager is familiarity with plant operations and ensuring that job scheduling results in effective plant performance. This, he believes, allows the other units to function in a synchronised fashion. David attributes his job performance to his drive: *'I guess it's the drive more than anything'* (INTFP07, L874). David steers this drive and demonstrates leadership by convening 'commitment meetings', at which fundamental questions concerning unresolved problems are discussed and commitments for the upcoming week are decided. In the event that the team is unable to reach consensus, David relies on his experience to steer the group: *'So, you need to have that background to be able to turn around and say, that's not the best option, this is the best option'* (INTFP07, L774-775).

This drive and efficiency is what David regards as the hardest knowledge to transfer: *'I guess you have got to hope that you can employ somebody to replace that person or individuals with the same sort of drive and, you know, rigour, in the way they want to operate'* (INTFP07, L891-893).

Relationships and Engagement: David has built his knowledge expertise by understanding Gothamfield's marketplace and, particularly, through his experience in the mill and associated relationships. David believes that his key role is fostering a relationship with the customer. He

believes that he was handpicked for this role because he has knowledge and skills acquired from two high performing divisions at Gothamfield Limited.

David believes the critical aspect of his job in managing the plant is communication because he considers that staff must understand the drivers of the business and not just be concerned with their specific function: *'Communication is the critical part from my point of view…I need to be able to get people to understand what the market drivers are so that we can drive the plant in the right direction'* (INTFP07, L493-596).

David shows depth of knowledge concerning the organisation's performance and the capabilities required to drive performance. With every role change, David has transferred his skills across roles by effectively communicating internally the organisation's position in the industry market. David encourages thinking among his co-workers and emphasises the importance of open communication. This ability to communicate and understand the key business performance indicators allows David to effectively manage contractors. David claims, however, that before Gothamfield outsourced, labour resourcing was internal. His knowledge of operations is valuable in assessing the output of contractors and the value outcome for the organisation: *'If you don't remember what it was like when it was in-house, then you don't really understand what the contractors are doing for you, and they can rip you off'* (INTFP07, L669-672).

David strives to achieve skills in the areas of building networks, appreciating individuals' areas of skills, and knowing when to step in and troubleshoot. Personal learning and maintaining contact with experienced individuals' builds connections between newcomers is evident in the following quotation:

> *I find the younger guys will come up and say, 'Well, I've got this idea but I don't know who to go and talk to'. So, you can say 'Well, yeah, I know Fred down at iron making, he's into that sort of thing, or a computer whizz or whatever,' and you can direct them to the right areas, so, you always feel that you are of value to them (INTFP07, L639-643).*

David supervises approximately 300 employees, and almost 50% of these employees are aged 46 years or older. He states that he is already facing difficulty in replacing them. The largest cluster under his supervision is aged between 30 and 40 years. David states that he finds the older workers to be more loyal and to have a stronger work ethic. The younger generation seems to want and expect more. David echoed sentiments expressed by both Mia and Roberto in that he had experienced difficulties with the younger generation, who seem to have different work

styles and ethics. Although he claimed that the younger generation do not perform poorly, they tend to have attitudes that can hinder effective collaboration. As he explains:

> *So, it's in that work ethic side and you do see it out in the plant. The older guys all tend to be self-starters, they are on time, do all the right things, and they don't shy away from a bit of hard work (INTFP07, L496-508).*

David made an observation concerning his relationship with the different teams of various ages, and the challenges that he has faced in managing them:

> *Generally, the 50-year-olds are a bit more, well, not a bit more, they are more loyal and have a better work ethic compared to the middle of the road group. They tend to be a bit like my son, they tend to be, 'I should get this, and I should get it today,' you know, there's that, what's the best way to explain it? I guess in my day, whenever you went to work, you had a bit of fun and then you had to settle down, and you were going to get married, and then you would scrimp and save and get enough for a house, and it was like a basic house. Blankets up at the window and, you know, an old bomb out in the driveway to get up and down to work because you couldn't afford anything else, and you built up to, you know, within a few years, to get what you wanted. Whereas the younger ones, and it's that sort of Generation X, whatever way you want to put it, that have come through, and it is probably our fault because we give them everything as kids, and when they have gone to work it's suddenly, 'I am going to buy a house, oh, but I want what Mum and Dad have got. All furnished, nice car, and I am ready to go on holidays as well,' so you have got to have cash for that as well. So, they tend to want more and expect more I think. So, it's in that work ethic side, and you do see it out on the plant, the older guys all tend to be a bit more self-starting, they are on time, you know, they do all the right things, and they don't shy away from a bit of hard work. Whereas the other ones tend to, oh, I'll sit and read a book for a little while, you know. Done my job for the day, whereas, hang on, you are paid for 12 hours, we expect you to work for 12 hours, not for half of it (INTFP07, L484-500).*

Emotional Behaviours: David is driven by a passion to learn and excel in his work. He constantly examines how things can be done differently and better. As retirement approaches, David discusses stress, self-esteem, denial, anger, and other negative feelings are common feelings that he and others in the same retiring situation experience. David, however, reframes his emotional feelings and has practised job detachment from an early point in his career:

I mean I could very easily settle in to building a position that will be there forever, you know, and then somebody will come along at some point and think, hang on, we have got all these different layers, and now we have got to cut some out, which happens as you go through the cycle. But if you do it properly, then you can keep progressing and moving on and say, well, I have achieved that part of it, but I don't need to be there to do it anymore so, therefore, I can move on to do something different. You know, I want to do other things (INTFP07, L608-613).

Continuous Experiential Learning: David believes that Gothamfield's major strength is that it provides employees the opportunity to rotate jobs. He recognises three major learning stages of his career– apprenticeship, engineering, and business management. He was keen to develop his skills, and the organisation provided the opportunities for up-skilling aligned with his knowledge interests. David was attracted to the opportunities in these knowledge areas and this suited Gothamfield. This attraction to knowledge areas was evident:

You know, as I say, some of the guys are just still in the trade 40 years later and you think, well, I mean they are happy, that's what they want to do. But I realised fairly soon that it wasn't what I wanted. So, then I used the business to move onwards and upwards.(INTFP07, L140-144).

David is a self-assessor, reflector, and keen learner. He shrugs off age, keeps moving, and continues to contribute to the organisation:

Well, yeah, I mean some people say you will be getting close to retiring, and I say, 'No, not yet…I have still got a lot to offer, and I still want to learn more', so…the next level would be unit manager, so, that is on the horizon at some point. That's why I say, if I do this job properly, within a couple of years I would be looking to move to the next level because I have completed this and I might not, I'm not an empire builder. I don't just want to build a little empire and stay there forever. I always like to be doing new things and moving on, learning new things all the time so, yeah, who knows what will be around the corner in a couple of years (INTFP07, L649-655).

David's narrative shows that behaviours are embedded within the organisational culture, and contexts are derived from particular situations and settings. Many employees have found it difficult to transfer tacit knowledge to explicit knowledge. David confirmed this when he said:

It's hard to put into words, but it's sort of the way that the plant has to operate as one unit at a time on several different components as a one horse chain. At any one time,

there's a couple of people who do have that knowledge and not just myself…we highly interact together (INTFP07, L846-851).

David observed a change in learning during his time at Gothamfield. A transformation from building skills in one area to multiskilling was a significant flexible change that he welcomes. He believes that the way skills were controlled and unfolded may have contributed to his appetite for learning:

Some of them are still motor mechanics, some of them are fitters, some are electricians, and I just don't know how they have done it for that length of time. I couldn't have, you know, whenever I look back, I couldn't have done it for that length of time. I would have just gone mad. You know, you want to do other things because, in those days, the Unions were a lot stronger, and the demarcation rules were rubbish in those days but, as a mechanic, I remember that you weren't allowed to get on a lathe, for example, you weren't allowed to use a welder, you know. We get taught some of those basic skills at TAFE[7], and then you come to work and you pick up a welder and I'd just walk out the gate, the Union would say, 'Oh, you can't do that, you can only do this bit.' Whereas, I didn't go that way. If I could learn something, somebody would say, 'Oh, we need to spin something up on the lathe', and then, 'I'll show you how to do it', yeah, I'll be in it. I would always want to have a look (INTFP07, L204-212).

Value and Recognition: David's strength lies in knowing the divisional interconnections with plant operations and the ability to know what needs to be fixed and improved without costly mistakes:

I know the current systems fairly well because I have been around for quite a while and know what we have done with the contractors and the previous way it was set up. So, from that point of view, it is easier for me … to make a linkage to say, well, yeah, that was the best part of it we will take, that wasn't quite so well done so we need to improve on that (INTFP07, L72-75).

David has a strong philosophy that he believes stems from the organisational culture and how he as an individual reflects the relationship with the customer. David recognises his learning and philosophy and assumes leadership engagement where he can assert his knowledge and expertise. This reflects Gothamfield's philosophy of the 3Ts (INTFP07, L682-685).

[7] TAFE is the acronym for Technical and Further Education in Australia, which is composed of vocational education and courses that qualify under the Australian Quality Training Framework.

David recognises that his asset comprises the networks that he has built over the years in Gothamfield:

> *Well, the years of experience shows the network that I've built up over the years because I have been around in different areas … somebody will ring you up from the mill and want some information, or you want some information and you have got all those contacts (INTFP07, L634-639).*

5.5.3 KM and Support

Organisation and Organisational Improvement: One of David's roles is to monitor system improvisations and advance Gothamfield Limited's progress. Currently, policies to increase productivity are under consideration. David is a member of the leaders' group and recognises that record-keeping and documentation can play important roles in preventing failures and mistakes. He comments:

> *Somebody new coming in and saying that they have a contract, and then they have to make the same mistakes and blunders to work through. I guess it's one of the problems that you always have with bringing new people in, you don't get that experience or systems in hard copy somewhere so they can read it, and they have to make their mistakes (INTFP07, L76-80).*

A firm believer that knowledge brings value, David offers ideas on effective hiring. David considers understanding to be an organisational asset. His view is that experience is more important than certification. David's focus is workforce learning, and he confirms his passion for learning: *'I mean, you never stop, I don't think'* (INTFP07, L199).This philosophy influences his decision concerning whether to leave a company. David says that if he has already learned everything from a task or a company, he is attracted to new tasks or companies, and he desires new experiences and opportunities to learn. This passion explains how he can transfer knowledge to his team of 400 workers and, more importantly, his ability to impart understanding rather than just operations knowledge. Learning is associated with discovery, and David encourages discovery by asking 'why': '*It's easy to just take steps, but why do you do the steps?'* (INTFP07, L92). David supports his team by ensuring the synchronisation of activities at the strategic and operational level between all the divisions to improve processes for continuous improvement. David takes the culture of safety in Gothamfield seriously. He believes consistency with the policy is important, but also says: *'It's not just about the operation of getting the product out. It's about looking after the people'* (INTFP07, L779-780).

Technology: David considers that processes and systems evolve but, for work to happen, interaction is required: *'You still need that human interaction and, so; it's really the individuals' thought processes that determine how well you can get things going'* (INTFP07, L884-885). David firmly believes that technology and automation are not suitable for Gothamfield, which has old plants that require troubleshooting by experienced persons.

5.5.4 Conclusion

David concluded by saying that no employee is indispensable. He agrees it will take time to find replacements and may require the assistance of previous employees:

> *I guess you have got to be honest; they are not really going to miss a hell of a lot. I mean, I have seen a lot of guys they went through during the downturn, and there were a lot of guys at my level that took a package and retired and, within a matter of months, they were gone. You might mention a name and, 'Oh yeah, I remember Peter.' In real terms, nobody is indispensable; somebody will take over and move the ball forward. I mean, as I say, when I moved from the caster operations manager role and Dave took over four years ago, you sort of think I have got to keep an eye on that because he's not going to be able to run it properly, but in a matter of months you step back and it's his area and he just gets stuck in and does it. I don't think you are really missed for any real length of time, it's really that transition of somebody else taking your role on or that role goes…somebody will say, 'I used to get that bit of info from FP07, how come I'm not getting it anymore? Oh, he's left.' 'Who do you want it from,' or, 'Do you really need it?' Or, 'No, I'll get it from somewhere else.' So, after a period of time that fades quickly, sometimes, it could take a few months. When the manager who used to be here, Trevor, he was a manager at steel maintenance, he left and went to Batman Hill, and he had been at the Caster. He had been in the tech group, and then he had moved up into the next level, and he had a wealth of knowledge and, of course, when he left and went to Batman Hill, it was like, hang on, we are going to lose all this knowledge. But he was only at the end of the phone periodically, and he would ring and, then, over a period of time, he wouldn't ring as often, and then he wouldn't ring at all, to the point where what did you need to ring him for, you know, he's been off this area for over a year, everything's changed, there's a different manager with different ideas, so you already can sort of keep track. Oh, we used to do this, and this is what we want to keep doing. So, I'm a bit more of a realist in that area, and I don't think they will miss me too much (INTFP07, L819-840).*

David believes that specific knowledge might be difficult to replace because *'experience and the knowledge you have got in a particular area'* (INTFP07, L819). He believes the organisation will lose certain knowledge as soon as he leaves but adds that he can always return as a consultant. His advice to new entrants is that Gothamfield has much to offer in terms of work and job satisfaction. He suggests that senior managers should identify the ambitions of the younger generation because the company has flexibility, and the future is in the hands of the employees.

5.6 Pablo

5.6.1 Authentic Expert Knowledge

Experience: Pablo is 60 years old, male, with 32 years of service with Gothamfield Limited. He possesses extensive knowledge and experience in mining and began his career as a qualified engineer with a bachelor's degree in mechanical engineering. Pablo has a background in project management and engineering in the mining sector, and specialises in project delivery. At the time of the interview, he was a project manager in exploration and business development. Pablo had developed reflective and critical thinking skills, which have enabled him to transfer his technical knowledge and skills beyond the manufacturing plant to the mining business.

Titles and Positions: Pablo has assumed a new role almost every two years. These roles have ranged from managing the BOSS steel-making shop and maintenance to managing the pallet plant, mining operation, and railways. Each role that Pablo has assumed has exposed him to a different part of Gothamfield's business. He attributes his versatility to his confidence and to passionate dreams that have allowed him to transfer and grow within Gothamfield:

> *Even before I finished my degree, I decided I was actually more interested in management than engineering as such, engineering in its purest form is designing things and doing calculations and all that, and that's not really what turns me on, it's more about managing and getting things done, so, again, it gets back to that making a difference-type thing (INTFP10, L145-148).*

5.6.2 Knowledge Contribution

Know-how: Activities, Actions, Responsibility, and Accountability: Pablo states that his critical contribution is the setting-up of new mining sites, which draws on all his previous experience within Gothamfield:

> *It's about mining and opening up mining in new areas or areas that were mined previously with Organisation X[8] and also bringing on new plants, new crushing plants, or beneficiation plants to process low grade ore and high grade ore and reinstating rail lines and all of the facilities to be able to expand our mining operation (INTFP10, L11-14).*

Pablo describes his work as lacking routine. He believes that two years of orientation are required to work in his field and, even then, a holistic strategic vision may have to be limited to

[8] This is a pseudonym that has been given to an organisation that Pablo worked for prior to Gothamfield.

a project-focused vision. Pablo describes his job as bottom-line driven and a significant contributor towards the company's success: *'So, we have now got a project that's considerably expanding the iron ore business, which is also the most profitable part of our business at the moment'* (INTFP10, L66-67).Pablo's contribution to the major project can be described as innovative and unique: '*Normally, to develop a large iron ore resource and turn that into a marketing business, you would do your exploration first … whereas we are really trying to do the whole lot at once'* (INTFP10, L188-192).

Pablo is driven by his project vision, which is aligned with the vision of the organisation: *'It's around having a clear vision of what we need to do, and that's quite complex in this project'* (INTFP10, L186-187). Pablo has also demonstrated leadership skills. He quickly identified that his engineering knowledge and skills were transferable and could be applied in all the roles he had assumed over his 32 years of service. Pablo believes that his business knowledge, together with his engineering and project background, has kept him immersed in some of the most exciting projects within Gothamfield. Pablo transfers much of his practical knowledge into those projects by adopting a cultural and aesthetic approach. Within these projects, Pablo manages complex issues successfully. The projects have focussed on change, as Pablo describes when listing his experience and activities in opening new mining areas (INTP10, L1-14).

Pablo is transferring his knowledge to new areas and wants to institutionalise his knowledge. He asserts that his background qualifications and getting the 'right mix' was, and remains, critical for his project success. The 'right mix' shows that tacit know-how is complex and ambiguous. Pablo possesses a background in engineering and project management in mining operations. He also has managerial skills that he channels to ensure that the right people are working on the right things, are motivated, and understand deadlines and timetables:

> *So, I think the sort of managerial skills, of being able to lead a team of people and get the most out of them, is one of the most transferrable things that I took with me right through all of that. And that's then varied from running operational departments to running project teams and so on (INTFP10, L148-151).*

Pablo's job entails risk-taking and, particularly, ensuring that Gothamfield manages risk. As he puts it: *'It's a risk, the more people you manage, the more the risk is one of those things will occur, even though you do a hell of a lot of work on safety'* (INTFP10, L214-215).

Pablo's previous experiences working in various areas of Gothamfield have equipped him with the skills to manage risk and develop risk-mitigation strategies.

Relationships and Engagement: Pablo's description and narrations make it clear that his relationships with colleagues, peers, and members of his team are formal. He separates his work life from that of the broader community:

> *I also learned that if you have good people working for you and you manage them well, then you don't need to be able to do their job for them. You can get them to do their job and do it well, and that's all part of being a good manager … I think the fundamental thing is in good management skills because you know it's a big organisation, there's a lot of good people around. It's being able to coax and develop those people and get done what needs to be done (INTFP10, L157-159, L323-325).*

Pablo also suggested that he likes working with like-minded people: 'People that are motivated, that are keen to get on and make a difference, keen to do their job well, probably that share the vision of making a difference and making things better' (INTFP10, L163-164).

Emotional Behaviours: It is evident from the demands of the project that Pablo has considerable energy and works hard to drive a team towards project success. Although not discussed at length, Pablo hopes that he will be valued when he leaves the organisation, which exhibits a sentimental side to his personality: *'I want to be able to retire and say I did this and that and changed the business and made it more profitable and gave it a longer future and more life and all of those sorts of thing'* (INTFP10, L125-127).

Towards the end of the interview, Pablo mentioned the events that affected him the most emotionally during his career at Gothamfield. These were three fatalities that almost stripped him of his love of life: *'I attended a workshop recently that the mine people had on safety, and I did a presentation on what it felt like to have to deal with fatalities. That was very emotionally draining'* (INTFP10, L225-227).

Continuous Experiential Learning: Pablo believes that to maximise learning experiences, an individual must be deeply embroiled in practice: *'Thrown in the deep end, I learned how to get that place to perform by having the people who did know how to run the place do it and do it well'* (INTFP10, L270-272).The greatest learning and self-awareness experiences for Pablo came from the three fatalities:

> *I made sure that the people that worked for me that were impacted by those, were looked after, but I didn't look after myself very well. No. And it was 10 years after the event when I finally went and saw a psychologist (INTFP10, L209-212).*

This has given Pablo considerable self-awareness; he understands his commitment to the organisation, and recognises safety values and his engagement and relationships with his peers, colleagues, and team.

Value and Recognition: Pablo believes that he is grounded in relation to projects because of his exposure to Gothamfield's strategic insights:

> *Understanding enough about our infrastructure to know again what can be delivered and what can be squeezed out, and what becomes ridiculous if you try and do too much, then you are spending too much money, and the return is not there (INTFP10, L99-103).*

Pablo believes that the secret to being successful in his position is in understanding the organisation and its operations. He explains what he means by the term 'understanding':

> *Understanding enough about our mining operation to be able to know what I can deliver and what I can't and what it takes to deliver that. Understanding enough about our infrastructure to know again what can be delivered and what can be squeezed out and what becomes ridiculous if you try and do too much, when you are spending too much money and there is no return (INTFP10, L97-101).*

Understanding (which relates to the knowledge built over years and the experiences and insights gained) is tacit knowledge that can potentially be lost. Pablo believes that Gothamfield has a unique set of peculiarities and complexities, and a worker must understand the business to oversee a large project. Through reflection, Pablo realises that most of his experiences surround the building of contextual understanding.

Pablo was asked what he would credit his 32 years of successful outcomes in the business. Gleaning from Pablo's response attributes of confidence, familiarity and subtly conveys is what he does within the organisation and how he connects with the people and the organisational activities can be seen. As Pablo says:

> *Not much of what I do is out of an engineering textbook or straight out of a mining/engineering operation, it's around knowing what can be done and what it takes to get something done (INTFP10, L32-34).*

Pablo's mechanical engineering background has been significant in allowing him to lead projects. He believes, however, that his experience over the last 32 years working for Gothamfield, understanding the linkages in the business, and developing a fundamental understanding of all infrastructure surrounding the mining business represent the most critical knowledge aspects that he has developed. Additionally, changing roles every two years has

increased this knowledge and served Gothamfield in its major projects. Pablo's influence on successful projects has been widespread. When asked what is most fulfilling about his role, he responds:

> *The most fulfilling thing for me is to make a difference to Gothamfield and DISTRICT 1. I want to be able to retire and say I did this and that and changed the business and made it more profitable and gave it a longer future and more life and all of those sort of things' (INTFP10, L125-127).I have sort of a combination of a mechanical engineering background and mining knowledge and experience … developing new projects … or change … and what that does for Gothamfield. So, I think they're really my key strength's and background that I bring to my role (INTFP10, L128-130).*

5.6.3 KM and Support

Organisation and Organisational Improvement: Pablo was selected approximately two years ago to head a lucrative project that is expected to deliver the growth initiative for Gothamfield. When asked if he would be missed by Gothamfield when he retires, he modestly replies:

> *I think most people think their career or their position is fairly indispensable or will leave a large hole, and the reality is that it's like taking your hand out of a bucket of water; water rushes in and fills the void pretty quickly (INTFP10, L232-235).*

The critical factor for Gothamfield is not filling a space, but rather filling a space with the right person so that there is no displaced knowledge.

> *It's not about being indispensable, I think it's more about…obviously, you will have to retire one day but, when it comes, finding that person who will actually be able to roll with the job that's ongoing without a standstill moment. I think that's the critical thing, isn't it? (INTFP10, L222-230)*

Pablo has a keen interest in business and people management. Individual interests and passion are traits observed in long-standing employees, and the organisation supports these traits in some ways. What fuels the interest and passion, and whether these characteristics can be stimulated in new entrants, is a significant factor in retention. A passion that Pablo pursued independently was to learn and develop his technical capability. He found inspiration watching his older brother '*go places*':

> *After a few years in District 1, I quite liked the lifestyle here, and I always had the opportunity for a new job roughly every two years with new challenges and new*

opportunities, and that interested me and excited me and has kept me going for 30 years (INTFP10, L294–300).

His interests, however, allowed him to gain experience and rotate through the organisation as he desired. Pablo believes that rejuvenation is important for the organisation, but he also voices concern that some knowledge is critical and should be managed promptly:

You lose older experienced people, and then it's hard to replace their skill set and so on. But, I think fresh ideas and fresh people is a healthy balance as long as you've got enough of the experience and knowledge to be able to manage that forward (INTFP10, L329-335).

Pablo emphasises the importance of progression and the constant refreshing of ideas. These can affect organisational performance. Pablo also states that no employee is indispensable:

You know, most people think they are pretty invaluable, but they can be replaced…I don't see myself as indispensable in any way. Sure, there's a lot of experience and knowledge and background I've got, which is useful to the company, but you can always replace people. No one's that indispensable [laughs] (INTFP10, L329-335).

Gothamfield's business is unique in that the exploration is dependent on manufacturing, and manufacturing is dependent on exploration. Using the equipment currently in place implies that past knowledge and skills are required to adapt the equipment to current needs. Pablo suggests that the knowledge and skills that he holds may no longer be relevant to the type of dynamic explorative activities in which the company is engaged: *'It depends a bit on where the company is at and what it needs at that time' (INTFP10, L313-314).*

Throughout the interview, Pablo appeared serious and guarded. When the tape recorder was switched off, however, he mentions that he fears that Gothamfield lacks vision and strategic direction. A strategic thinker, Pablo feels he can contribute further to Gothamfield in the area of 'business sustainability' (INTFP10, L314).

5.6.4 Conclusion

Pablo does not believe that he is indispensable:

I think most people think their career or their position is fairly indispensable or will leave a large hole, and the reality is that it's like taking your hand out of a bucket of water, water rushes in and fills the void pretty quickly (INTFP10, L232-234).

A skill that he believes a manager ought to have in Gothamfield is people management:

> *I think the fundamental thing is good management skills because you know it's a big organisation and there are a lot of good people around, it's being able to coax and develop those people and get done what needs to be done (INTFP10, L323-325).*

Pablo has developed a wealth of knowledge during his years at Gothamfield and his various roles over 32 years with the organisation. He finds it difficult to express the details of his past work and current projects. He often uses the word 'understand'. When encouraged to explain what he means by 'understand', he states: '*That comes more from experience I guess in terms of what's there, what it's capable of, and what it needs to do more'* (INTFP10, L113-114).

5.7 Menzies

5.7.1 Authentic Expert Knowledge

Experience: Menzies is 47 years old, male, and was born in the UK. He arrived in Australia when he was two years old. He has worked at Gothamfield for 30 years. His educational background and expertise are in electrical work. With trade qualifications, he began as an electrician apprentice and progressed through various roles. Over the period of his working life, he has completed numerous work-related courses and training. In recent years, Menzies completed a leadership course and found that he could relate to the program. He has been a health and safety environment business partner for four years.

***Titles and Positions*:** Menzies has held five roles in his 30 years with Gothamfield and three roles in the last 10 years. He has worked as an apprentice electrician, a tradesperson, and then a maintenance supervisor with a team of fitters and electricians. Menzies has held a supervisory position for almost 13 years, which is his longest-held position. At the time of the interview, Menzies had been a health and safety environment business partner in the products division for four years.

5.7.2 Knowledge Contribution

Know-how: Activities, Actions, Responsibility, and Accountability: Although Menzies is involved in maintenance, he believes that his role borders on HR, and he has skills in that area. In his current role as health and safety environment business partner, Menzies teaches staff safety policies and procedures, identifies behaviours that require change, and initiates the appropriate interventions. Menzies considers himself to be a change agent, and most of the changes he undertakes involve HR-related functions within a technical role. As he says: *'Most of the time spent in the role is engagement with people, either communicating the systems or engaging with them to change at-risk behaviour and change the way that they look at a job'* (INTFP17, L182-185).

Menzies spends considerable time conveying the organisation's safety attributes and competencies to his team of electricians. He also coaches other leaders on safety measures. Menzies considers that his extensive knowledge of the organisation and its operations provide the ability to understand the regulations. He can translate this into accessible working knowledge for the employees mainly because he thinks and acts within a team rather than as an individual.

Menzies does not make individual decisions to a great extent, but he updates the OHS[9] regulations and communicates them to the workforce. Menzies deems that the critical aspect of his role is keeping all employees safe at work. The key factor in his success is his credibility and his ability to earn people's trust. Menzies takes pride in his relationships with his division employees and says. *'I guess I know just about everybody by name, all 365 of them'* (INTFP17, L297). Menzies possesses substantial wisdom concerning people management, which is something that Gothamfield will lose on his departure. Menzies is highly capable in managing people, unlocking talents, and managing diversity. He believes that a critical aspect of his role is people skills and effective interpersonal skills. This, he believes, comes from a basic set of values concerning how others should be treated.

Most of Menzies' work is independent; however, he believes that he still spends 50% of his time working within a team. He believes that ability and continued capacity to work in a team and relate to a group is an advantage in successfully advocating change. Menzies believes that company policies support his work and his ability to transfer his knowledge and expertise in his current role in Occupational Health and Safety (OHS). Menzies is also prepared to challenge any changes that the management wishes to introduce.

Relationships and Engagement **-** Although he holds a senior leadership role, Menzies considers himself part of a team. Contributory factors in his success in positively changing behaviours and safety practises include his ability to form relationships with most employees, even if he just learns their names: *'Supporting them. You know, whether they need guidance … Know them. Even knowing them by their name gives them a sense of worth…I think by knowing the people, acknowledging them'* (INTFP219-208).

Menzies shares his knowledge in a number of ways. These include demonstrating credibility, anchoring trust among the workers and, when necessary, demonstrating safe work practices. Menzies' knowledge is also transferred when he provides support to the workers and when he assists in the paper administration of any safety recording or any other lengthy reporting process. Menzies' relationship with many staff in his division is strengthened by his leadership drive for safety. Gothamfield's culture encompasses a philosophy observed by many individuals, particularly Menzies, who was personally affected by a fatality that was caused by unsafe practices. Menzies finds that by engaging through safety, he connects with the passion and commitment of staff:

[9] OHS encompasses the regulations and codes of practice required to ensure safety around workplace hazards to avoid injury or disease.

> *To see the amount of passion and commitment amongst the shop floor worker in trying to make their workplace safer by coming up with initiatives and projects, eliminating risks, or reducing the severity of a risk, that's pretty rewarding to see people jump onboard and just get on with it, and execute it themselves rather than expecting management or the business to solve the problem for them (INTFP17, L191-201).*

Working with many of these long-serving employees, Menzies has found that an ideal way to bond and be an exemplary leader is to lead a culture of safety. Menzies recalls changes that have been introduced as a new style or initiative because a manager has been replaced. Menzies is a loyal employee of Gothamfield but will challenge a manager on an unnecessary change. Menzies considers that his responsibility is to ensure that changes do not cause employees to disengage. A story that Menzies shares with younger generation is on the subject of safety:

> *Going back six or seven years, we only had two or three people we would put up for nominations … last year, we had 26, the year before, we had 45 nominations, so, I guess that I can sit back and feel proud that, you know, I had a hand to play in that. But the people out there were doing the stuff, we needed to recognise it, and that was something that I think the business steel products has been … put on the mantelpiece as being the leader in safety improvement or, you know, the aim became the people with respect to safety because the amount of people that do stuff and get recognised for it. I can feel pretty comfortable that I had a hand to play in that, and that's been the betterment of steel products and the business … there's been lots of things that steel products has done very well with regards to health and safety. We have got probably one of the biggest OHS committees, safety reps, OHS safety representatives for the work groups. Some 17 or 18 of them … and that's something else that I can feel proud about. Driving that enthusiasm, keeping the guys motivated more to the job than what you think it is and, you know, look at the OHS registers and read what your role is, and I want you to do more than that. You are representing your work group … that's been successful, and I think we have benefitted from that. So, there's a few, but nothing that really stands out. Just the change in people. The willingness to get involved. That's got to be good for the business (INTFP17, L370-385).*

Emotional Behaviours: Menzies' relationship strengths within the organisation can be summarised by the word 'passion'. He uses this term to describe his unique strength and understanding of his team and groups. He also uses the term to describe the connectivity between himself and the employees. Moreover, Menzies uses *'passion'* to describe the employees, for example, his reference to the *'passion and commitment among the shop floor worker in trying to make their workplace safer'* (INTFP17, L191–192). Menzies can recognise

passion in others. He believes that he has good leadership skills and trusts his passion to coach others effectively. At least in this context, passion refers to an intense, driving, or overmastering feeling or conviction. The role that Menzies currently holds as health, safety, and environment business partner came about through the foresight of his manager, who was himself passionate about safety. His manager identified Menzies, who was keen to be part of a group and team who did not compromise on safety. Menzies says:

> *We had a pretty good working relationship right from the start. I think he knew I was a team player. I guess that's primarily because the day he arrived, we were on a breakdown. It was a mechanical breakdown, and I was the electrical supervisor at that time. He obviously saw my passion for safety, and that I certainly wouldn't walk past stuff and instead would challenge it. I think that is the most important thing you can do (INTFP17, L257-265).*

Menzies is emotionally intelligent with his people connections and recognises passion and commitment. Menzies states he is passionate about safety at the workplace. In comparison to the many staff on the shop floor, however, he says:

> *To see the amount of passion and commitment amongst the shop floor worker in trying to make their workplace safer by coming up with initiatives and projects, eliminating risks or reducing the severity of a risk, that's pretty rewarding to see people jump on board and just get on with it, and execute it themselves rather than expecting management or the business to solve the problem for them (INTFP17, L191-195).*

Menzies believes that through his passion he will instil a sense of responsibility among the 365 products division employees for safety in their areas, and that they will not entrust this responsibility to the management:

> *So, I guess that's the biggest win, and I like to think that I have had a part to play in that change. By spending a lot of time … with those people, encouraging those people that we are willing to do it ourselves (INTFP17, L199-201).*

Continuous Experiential Learning: Menzies is loyal to Gothamfield and emphasises the influence of loyalty on individual knowledge and learning. Currently, learning, education, training, mentoring, and coaching are dominated by knowledge transfer and sharing endeavours; whether or not the knowledge source is sufficient is a subject that has not yet been studied. Individuals such as Menzies, who have worked only with one organisation their entire working life, accumulate knowledge from experiences and learning from their specific practices with that one organisation. Employee knowledge is deeply rooted in individuals. The foundation of

Menzies' knowledge is in the organisation and he acknowledges: *'I love Gothamfield. It has given me my life. It has given me my education and probably the qualities and attributes'* (INTFP17, L310-311). Menzies recalls the words of his father when he worked with Gothamfield:

> *Dad used to say especially leading by example and, you know, if a job's worth doing, it's worth doing right, and I guess I have always thought that too. If you are going to do something, no point in doing it half-hearted. Otherwise, you are wasting your time and wasting somebody else's money (INTFP17, L280-283).*

Menzies strongly conveys his loyalty for the organisation in his interview. He takes into account the needs and instructions of management and the interests of the working community and the labourers.

Pride and Knowing: Throughout his career, and in his current role, Menzies considers that he has been a team player. This has not required any training, even when he worked with certain divisions with specific individual functions. His role with OHS requires that the legislation management process be regulated and updated.

Menzies enjoys being challenged, which provides an opportunity for him to extend his learning, and which is supported by the organisation: '*Whatever I have done, I have always enjoyed it, and you are always looking for new challenges like I said'* (INTFP17, L530).

Value and Recognition: Menzies' supervisor recognised leadership potential. When asked to explain, Menzies, after a long pause, attributed his leadership capability to his ability to be a team player. He then narrated a situation concerning a mechanical problem. Menzies, as the electrical supervisor, worked alongside the fitters to resolve the problem without hesitating, although he lacked the qualifications to do so. His supervisor also had a mature attitude to workplace safety. This supervisor did not express his opinion of Menzies' capability directly but selected him for a leadership role and to act as a business partner, demonstrating his faith in Menzies' leadership capability. Menzies considers his loyalty to be the reason that Gothamfield has supported him. He says: *'I love Gothamfield. It's given me my life…my education; it's given me probably the qualities and attributes that I have. I don't know whether I would have got that working for anyone else'* (INTFP17, L310-312).

5.7.3 KM Support

Organisation and Organisational Improvement: Menzies measures his success by the number of safety excellence awards nominations received by the organisation. Menzies believes

that these awards send a positive message to employees, and that behavioural change in organisation members represents a positive trend. The number of safety organisation members grew from two to three approximately six years ago to 45 in 2010. Menzies' ability to transfer his knowledge and allow workers to recognise their safety talents represents a major impact and capability that he has instituted: *'Just the change in people. The willingness to get involved. That's got to be good for the business, surely'* (INTFP17, L384-385). Not satisfied with this outcome, Menzies describes pockets of excellence and pockets of skill gaps: '*I'm not naïve. I do know that it's impossible and that there are some leopards who just won't change their spots'* (INTFP17, L389). Menzies also demonstrated an understanding of who is resisting and why, and he states that resistance has come from supervisors who seem inundated with administrative tasks.

Menzies evaluates Gothamfield's innovation and competitiveness by the organisation's ability to meet the health and safety regulatory standards. Gothamfield has passed the accreditation and external assessments. Menzies believes that the organisation responds to the marketplace in a timely fashion and accredits this to the resourcefulness of the senior management.

With respect to imitability, Menzies believes that no other steel plant manufactures steel rolls as quickly as Gothamfield. Imitability represents unique specialist knowledge that is valuable and relevant to the organisation. Menzies recognises, however, that employees do not have a clear understanding of Gothamfield's direction and position in relation to other similar organisations. Menzies considers that employees are (to some extent) only interested in partial information and do not contemplate the organisation's position because their only concern is their job.

Menzies has only known Gothamfield as an employer and is not aware of competitor benchmarks or the market position of other companies. This lack of competitor knowledge and benchmark standards could be regarded as a flaw considering the mobility of current workforce labour. In the current business environment of knowledge exchange and cross-pollination, could this be a reason and cause for the retardation of knowledge within the organisation? Menzies reflects on his own role and that of others with similar roles, and concludes that he does not know how the other business partners act or manage safety activities. He sees a balance, however, between people and procedures and considers their engagement to be important. He will work alongside employees on the floor to stimulate processes when needed because he believes new procedures should not affect the workers' functions.

When asked, 'What will Gothamfield miss if and when you leave?', Menzies responds by saying: *'Nobody is indispensable'* (INTFP17, L462). After a long pause, however, he adds:

My help. Because that's the role I see my role as … someone to help people achieve what they want to do. Support and help, not just support, the lot, management, the lead team, and the workforce. So, I would like to think the next person that moves into the job might be just like me, and I won't even be missed. Who was that guy? (INTFP17, L466-469)

'Support' is the key word. Support is the conduit between management and people that clarifies and responds to individual needs. Menzies is uncertain whether he will be remembered for his knowledge and skills contribution. With respect to knowledge loss from retiring employees, Menzies is concerned with the loss of know-how and savvy, and not processes. The rolling mill, or the steel plant operations, requires employees with real-life work experience:

They have worked in the rolling mill or in the steel making BOS[10], so they have got a lot of real-life experience with young kids and new people, especially with the maintenance people. It's probably more of a worry for me because we have got young people who haven't experienced that through working with a knowledgeable well-matured tradesman, teaching another round of young kids coming in, so that just doesn't exist anymore. And that's the big worry (INTFP17, L544-548).

Menzies believes in the power of a leader's knowledge. He believes that it is vital to share and preserve leadership experiences. His personal memory of his father (who once worked with Gothamfield) provides some words of wisdom: *'I remember some of the conversations and some remarks that Dad used to make, especially leading by example and, you know, if a job is worth doing ... it's worth doing right' (INTFP17, L280-283).*

5.7.4 Conclusion

Menzies' contribution, commitment, and dedication to Gothamfield are suggested in the following statement:

I am a firm believer that if you say you are going to do something, you do it, or, if they are expecting you to do something then I'd be doing it myself. It's do as I say, it's do as I do. That I think has a lot to do with it. Being credible (INTFP17, L206-208).

Uneventful and unpleasant experiences have given Menzies a deep understanding of the need to achieve high levels of safety in work procedures, the knowledge gained through experiencing failure, and the knowledge to demonstrate credibility:

[10] BOS is an acronym for basic oxygen steelmaking plant.

What's critical is remaining credible in carrying out my job effectively. And anybody in this role, to be a safety business partner, has got to have credibility. Otherwise, people won't give you the time of day; they have got to trust you (INTFP17, L290-293).

5.8 Marcus

5.8.1 Authentic Expert Knowledge

Experience: Marcus is 50 years old, male, and has been with Gothamfield since 1977. Marcus arrived in Australia from Germany in 1970. He earned an honours degree in electrical engineering and claims that he struggled to obtain his degree. Arriving in District 1 at the age of 17, Marcus had the responsibility of caring for his siblings because his parents were divorced, but he wished to pursue his dream of becoming an engineer. Although he did not complete high school, he was not deterred from continuing his studies. Marcus continued his education by taking evening classes and realised his dream of becoming an engineer. His first job was as a scientific instrument maker, and his role at the time of the interview was plant manager. Marcus assumes a lead role in expanding and improvising the plant by applying his 34 years of experience from other parts of the business. He manages a workforce of over 400 employees.

Titles and Positions: Marcus has had many jobs since joining Gothamfield. He cannot recall exactly how many, but he believes he has held at least eight different roles. With company support, Marcus intentionally changes roles every three to five years to satisfy his thirst for new tasks. His longest role lasted four years.

5.8.2 Knowledge Contribution

Know-how: Activities, Actions, Responsibility, and Accountability: Marcus describes his current role as plant manager as being team-oriented, unlike his previous roles. Marcus' decisions are guided by the team and rely on the supply of appropriate information from many individuals before being finalised. Marcus supervises a workforce of over 400 employees, and the knowledge and skills he has as a specialist do not entitle him to make independent decisions. He says: '*When I feel I have enough to make a decision, then I make it' (INTFP16, L88-92).*

Recognising talent, making decisions, and farsightedness are some of the skills that Marcus has developed during his time with Gothamfield. He applies a systematic approach to his job and claims that, mostly, he has successful outcomes. Marcus is analytical, loves details, and approaches work with form and structure. He also has a great interest in history and is already considering succession planning. He describes himself as driven. Marcus demonstrates the systemic thinking that he applies to work in the way that he presents himself at the interview. His early education and role as a scientific instrument maker might have shaped his later image. Marcus' work involves financials, and he works very closely with accountants conducting high level workforce analysis. He sees himself as a strategist— leading and managing: *'I tend to be*

more focused on longer strategy, longer-term strategies' (INTFP16, L378). He extends the explanation to being a strategist:

> *I think it's to be clear about what needs to be achieved today and how that fits into the longer-term plan and just keep people focused. That's my day-to-day role. I think that's the key thing, make sure they're working on the right things. (INTFP16, L503-504)*

Marcus describes his liking of change, particularly at work, by saying: *'I get a kick out of it'* (INTFP16, L465). He is involved when the business changes, manages the way work is performed, and manages the challenges of workforce disruptions such as departures that come with business changes. Marcus manages the plant workforce skills, and one of the outcomes was the drawing up of the '*Spider Agreement*' (Steel Products Incremental Demand Arrangement):

> *The idea behind [the Spider Agreement] is it guarantees that the workforce will work overtime if demand increases at certain levels, so I'm able to flex the hours of work from 38 to 40 to 42 and 44 hours a week to meet changes in demand. (INTFP16, L321-323)*

Marcus contributes to workforce matters in committee meetings and negotiates at union consultative meetings. Most of his work involves making decisions concerning the handling of costs, and reducing various resources and labour management costs. His management of workforce reduction was, he claims, the best way to demonstrate fairness. He says: *'So, I drew up a matrix that had rated individuals in their job, and with the view, and I told them up front, I want to remove the people that don't add value'* (INTFP16, L285-287). Marcus believes he has identified a way to upskill the workforce in 18 months. Marcus takes personal pride in managing the knowledge within the organisation using meticulous documentation:

> *For instance, when I left the pallet plant, I actually prepared a file with all the, you know, how I set the scene, how I changed the workforce, and all the things I used over that time, all the supporting literature, and I gave it to him [team member] on a disk and went through it with him. And I've done that in every job, certainly since we got computers, prior to that I just wrote it all and put in folders (INTFP16, L589-593).*

Relationships and Engagement: Engaging with people is Marcus' key strength because it helps him to make reliable decisions. Marcus hand-picked his team, and the core consideration in doing this was who would work effectively with him:

> *You got to know people really well. So, the way I do it, I'm a fairly analytical person, I suppose. When I set a team up, I start off. I look at what qualifications and experience*

they have, then I try and build rapport with them and, from that engagement, I'll know how they behave, and think, and approach things and whether I can work with them or whether they can work with me (INTFP16, L95-99).

A story Marcus shares with new recruits centres on his initial experience:

I think a great story for me was the first time I got called in after I qualified. It's funny, you go to school, you learn all that stuff and, overnight, you know, once you get that piece of paper, the next day, suddenly it's supposed to be all different. You think that, but, so the first day I was qualified I got called in to the blast furnace here, in fact, I got called in three times for three separate incidents that night and I'd only worked there three months. But because I was now qualified, you know, I was flying solo, and the thing that I can tell you is the drive in to work was incredible, it felt, it was only three minutes but it felt like three hours. I was going through my mind, what could it be, what, you know, how am I going to fix to this, who will I talk to and all of that. And because the plant was down, the gas was being flared off, and I could see my watch in the light even though it was dark from the gas flame, so when I did get in, talked to people, found out what the issue was, I had to be totally reliant because I had no experience, reliant on drawings, what I'd learned, and go with the flow. And that was the most exciting part for me, I mean, all these people are there, waiting, not doing any work because the plant is shut down because they're waiting for me to fix it, so you had pressure, and the satisfaction of actually fixing it and getting them going was really good. I had a lot of personal satisfaction out of that (INTFP16, L570-584).

A significant part of Marcus' job is managing people and, during downturns, he has had to make many employees redundant. The intricacy in managing workforce redundancies is that 98%of Gothamfield employees live in District 1. Marcus believes there is a way of managing this:

It's how you do it. I found that I, part of it is that you do have to remove people, but it's how you do it, and I live in my community, I don't fly in and out, I see them when I go out, and they talk to me, I haven't had anyone come up and be disrespectful. If you treat people with dignity and respect, and you're honest, and saying that you can't go around being honest all over the place … but if you're frank with people, then it usually works out alright (INTFP16, L456-461).

Although Marcus is involved in workforce management, particularly for business reengineering that involves redundancies, he is mindful of the redundancies at Gothamfield and their effect on

the community. He values the extended relationships from work and the community, but also values business performance.

Emotional Behaviours: Marcus manages boredom well and believes that Gothamfield keeps him engaged:

> *Well, whenever I take on a new position, after three to five years you sort of get too familiar, bored, you start making changes because there's nothing else, you know. It depends on the individual, obviously, and I found that I stay more interested if I keep on changing. And this place is big enough to do that (INTFP16, L44-47).*

Marcus is passionate about Gothamfield's history. He has written stories about individuals in the organisation and, at the time of the interview, was developing a history of Gothamfield. He loves history as much as he loves stories, and believes that this love engages his interests while also enabling him to provide a legacy of the people and the organisation to others who will join in the future.

Marcus manages boredom by motivating himself with challenges: *'I quite like a challenge, when someone says it is a dead duck, and you can have a go and fix it'* (INTFP16, L472). Marcus believes that his stubbornness backs up his experience. He takes a lead role, particularly in initiating and rolling out changes, and ensures the people aspects are well-managed. He ensures people are taken care of in the change process because he believes he is part of an organisational group, but also because he lives in the District 1 community where most of the residents work at Gothamfield. Marcus believes that he has a *'razor-sharp wit'* and his behaviour shapes the organisation.

Continuous Experiential Learning: When asked what has shaped his expertise during the 34 years, his immediate response is: '*What experiences? I don't know*' (INTFP16, L335). Marcus (like the other experts) finds it difficult to reflect back on all the years of failures, success, achievements and, most importantly, learning. March (2010) suggests that experts experience two types of learning: (a) error produced when a sample of experiences has unrepresentative high returns; and (b) error produced when a sample of experience has unrepresentative low returns. These narrations explain that experience is complex and noisy and, thus, it is difficult for experts to identify past experiences without ambiguity. One area not addressed in March's (2010) work is how the tacit accumulation of learning experiences can be made explicit. This dissertation tries to fill this gap by explaining how the expert's knowledge can be made explicit to novice employees by engaging in both practise and sensed levels of experience. The

motivation for Marcus is the opportunity that Gothamfield provides. He believes that by exploiting this opportunity, he has learned, broadened, and deepened his experience.

Value and Recognition: Marcus places considerable weight on personal values. He believes that the values of the individual must be aligned with those of the organisation. For example, he once found himself in a challenging position, advising an individual with 50 years of experience to retire because he believed the individual's values were not aligned with those of the organisation (INTFP16, L351).

The problem of misaligned values is a challenge for the Gothamfield community because of their close social connections, and many employees would rather not retire. Although challenged with ensuring the right talent mix and a workforce that meets bottom-line expectations, Marcus' goal is to ensure a cohesive community within the organisation. He says: *'I like to build a sense of community and a community has one thing in common, they have a whole bunch of shared stories'* (INTFP16, L633-634). Juggling workforce issues and preserving trust is necessary and difficult; and it requires talent to maintain a strong, cohesive workforce. Marcus values feedback and believes that agreements are a way to acknowledge the contribution of works, as well as a form of historical record. This is evidenced by Marcus' role in the 'Spider Agreement' and other product agreements. Apart from these high-level contributions, Marcus believes that his key contribution to the organisation is in his day-to-day role keeping employees focused:

> *Old saying, you know, you water the garden, you water the flowers, but you also water the weeds for some reason every day … stuff happens and, I don't know, people love to deal with the noise rather than get on with the job, so I think it's to be clear about what needs to be achieved today and how that fits into the longer-term plan and just keep people focused. That's my day-to-day role. I think that's the key thing, make sure they're working on the right things (INTFP16, L500-504).*

5.8.3 KM Support

Organisation and Organisational Improvement: A plant that is 45 years old is capital-and-cash-intensive. The organisation can find it a challenge to sustain a workforce that understands and can maintain such old technology. Marcus believes that Gothamfield's workforce approach is an important refinement and reengineering strategy. A continued approach to ensure that the talented workforce is maintained, while not neglecting bottom line considerations, creates sustainable performance. Marcus' key contribution in this area is in finance and workforce costing. His budget is a billion dollars a year and (together with senior management) he works

on governance issues with the accountants, which he believes is an important organisational practice (for transparency).

***Administration and Workforce Management*:** Marcus dislikes the systems and procedures in place at Gothamfield and ensures proper documentation of all activity. A recent endeavour was to prepare his successor and, thus, he set up and documented a management operating system. Marcus took the employees offsite to acquaint himself with them and employed the 7-S[11] approach to devise his management system. One of his fears is that the knowledge he passes on will not be retained.

Another example of Marcus' systemic thinking is his authorship of the 'Spider Agreement'. Interestingly, Marcus has been involved in workforce planning and used the term 'add value'. He says: *'I'm very conscious about the levels of work, and we do value delivery to make sure that, as we go down the organisation, people know specifically what they're doing'* (INTFP16, L112-113). He continues: '*I want to remove the people that don't add value, due to absenteeism, if they're problem children and what not'* (INTFP16, L239–240).

Marcus is a highly pragmatic and industrious individual with foresight and a strategic perspective. He simplifies his explanations within a rather complex context, which implies that he simplifies his knowledge in a complex setting. In many instances, he seems to have no ambiguities surrounding his experience. Marcus is an example of an expert who has remained contemporary in his approach by engaging in practices that are farsighted, calculated, and risk-mitigating. He believes in undertaking plans and procedures with little diversion.

Marcus has clarity in his desires and achievements in the management of the plant. He understands his role and has developed a position description that he updates as he assumes additional responsibilities. Marcus believes that Gothamfield will miss his way of thinking and his experiences, particularly in making corrective interventions. Creativity and deviance, as March (2010) puts it, do not occur at the individual level, but are motivated by features of how one is shaped by their social surrounding. March (2010) did not discuss whether there is some stickiness in knowledge, and how an individual can proclaim a different way of thinking. Marcus explains this by stating:

> *I'm part of a team, and I have my own method of working. I look at the world differently than my peers. I mean, it's great that we're all different. So, there might be aspects of that team that would be missed. But, experience is the main thing. I look at our*

[11] 7-S is a McKinsey model that helps analyse an organisation's design by looking at the internal elements (strategy , structure, systems, shared values, style, staff, and skills) to identify if they are effectively aligned. This helps to allow the organisation to achieve its objectives (Kaplan, 2005)

manufacturing lead team right now. There's only one other person that's been here as long as me, all the others have got less than a couple of years of experience here, some have only a year's experience. If you don't intervene, they would've wasted time, money, and what not because I've seen some of these things before, and you can say, oh look, there's a risk around that (INTFP16, L439-444).

Some of his commentary suggests that Marcus assumes the role of *'hero'* or *'fire-fighter'*, a view commonly held by the engineers at Gothamfield. He considers, however, that he will not be remembered, even if he has made significant changes and has worked in alignment with the organisation's strategy and vision. When asked whether he values experience over proven experience, he replies:

Once you have it, I like that actually, because proven experience I work with a person now who has like 40 years of proven experience in the manufacturing of steel products. Now, that's a huge benefit for me, given that I've got none. I tend to find that people with proven experience are locked in; they tend to stay within that industry or industry sector and not move on (INTFP16, L446-454).

Marcus is reflecting while narrating, and a level of insecurity arises, causing him to question his own experience and proven experience.

Technology: Marcus believes that a five-year plan to improve the plant's technology is necessary, but that it will involve heavy investment that must be supported by production demand. Thus, technological improvisation has been slow because the organisation has focused mainly on a return on investment and downtime during the technological improvisation process itself.

5.8.4 Conclusion

Marcus believes that for anyone to fill his role, qualifications are important but not critical; and that the aptitude to want to understand how the manufacturing side of the business operates, as well as knowing how to manage people effectively, is critical for the organisation's performance. Marcus emphasises several times during the interview that the organisation is *'working on the right things'* (INTFP16, L373) — matching the right skills with the right people.

5.9 Chapter Summary

This chapter reviewed eight individual expert cases from Gothamfield District 1, giving a holistic sense of the experts' perspectives. The experiences and narratives provide the context for this study, as well as for the data gathered from cases presented in Chapter 4. The cases highlight important themes that will arise in the data analyses. From these narrations, similarities and differences among the expert experiences during knowledge acquisition are arising. Moreover, the experts provide information regarding how they construe their organisational contributions and how they perceive the consequences of their departures to knowledge loss. Chapter 5 will describe the themes arising from an analysis of all 30 participants interviewed, and Chapter 6 will discuss the findings.

CHAPTER 6 – ANALYSIS OF EXPERT PERCEPTIONS ON THE LOSS OF KNOWLEDGE

6.1 Introduction

This chapter focuses on identifying experts' various knowledge contributions through an examination of their experience and continuous learning within the workplace. This analysis draws on interview data from 30 participants: 22 experts, 5 cadets, and 3 senior management staff members. The participants in this study were expert and cadet engineers from the manufacturing plant, and senior management from the mining-manufacturing headquarters. The examination of knowledge and experience is limited to the domain of individuals' specialised jobs and the context of the organisation. Common themes emerging from the interviews from all 30 participants were identified with a view to addressing the research questions and sub-questions described earlier in the thesis.

6.2 Analysis and Development of Themes

Chapter 3 discussed the theoretical justification of the data management process — collection and analysis. Here, the themes are discussed. Data analysis was designed to allow thematic categories to emerge from the interview transcripts of the 30 participants involved in the study. Each transcript was analysed to identify patterns for the development of appropriate codes. Inductively capturing and coding emerging themes was an important analytical process. Boyatzis (1998) emphasises sensitivity when coding and ensuring that the researcher's thoughts and feelings are not imposed on the raw material. A disciplined approach is required by the researcher to attain consistent observation within the context of the study. Table 9 shows the three critical, thematic methods of data extraction to synthesise and preserve the integrity of the study: (1) observing and perceiving, (2) interpreting, and (3) analysis and alignment with the dissertation's research question to surface these themes. The table displays an adaptation of Boyatzis' (1998) analytical process for application in this dissertation.

Table 9: The Thematic Analysis Process and a Summary of the Dissertation's Emergent Clusters

Thematic analysis	Organising process	Dissertation's emergent clusters
Observing and perceiving	Sensing the themes and recognising the information that is codable	Perceiving how experts contribute their knowledge, skills, and expertise and how their departure can cause knowledge loss to affect with consequences.
Interpreting	Encoding with consistency and code development	Interpreting through their language, stories, incidents, events, emphasis, dismissals, individual strengths and weaknesses.
Analysis and alignment	Interpreting the information and themes in the context of the research question, theory, or conceptual framework and contributing to the development of knowledge	Emerging themes in the organisational context a) Titles and positions b) Know-how (activities, actions, responsibilities, and accountabilities) c) Relationships and engagement d) Emotional behaviours e) Continuous experiential learning f) Value and recognition g) Perspectives on organisation and improvements h) Technology

Source: Adapted from Boyatzis, R.E., 1998

Table 10 below shows the experience profile of respondents' years of experience in the organisation; and their domain-specific area of practice or specialisation. The table also presents information on the type of role being undertaken, that is, whether it is an individual or a team-based role. Most of the participants aged between 45 and 65 years have worked for the organisation for between 15 and 43 years. Thus, the data gathered represents the perspectives of individuals with considerable experience with the same employer-organisation. The majority of participants have formal qualifications in engineering.

Table 10: Experience Profile of Participants from Gothamfield, District 1

Age group (years)	Years of work experience at Gothamfield	Specialisation	Work assignment	Pseudonyms in case story and analysis chapters
45-65	21	Engineering	Individual	FP01 Gabriel
	32	Engineering	Individual	FP02
	34	Engineering	Team	FP03Mia
	31	Engineering	Individual and team	FP04 Eric
	14.5	Engineering	Individual and team	FP05 Roberto
	40	Engineering	Team	FP06
	36	Engineering	Team	FP07 David
	19	Engineering	Team	FP08
	32	Engineering	Team	FP09
	41	Business	Team	FP10 Pablo
	38	Engineering	Team	FP11 Denis
	32	Human resource management	Individual	FP12
	34	Operations and logistical management	Team	FP13
	26	Engineering	Team	FP14
	34	Engineering	Individual and team	FP15
	30	Business	Individual	FP16 Marcus
	36	Accident and occupational health and safety	Team	FP17 Menzies
	42	Engineering	Team	FP18Franz
	37	Engineering	Team	FP19
	37	Business/finance	Team	FP20
	15	Business	Team/management	FP21
	20	Business	Team/management	FP22
	43	Engineering	Team/management	FP23
	43	Engineering	Individual and team	FP24
35-45	15	Business	Team	FP25
20-35	4	Engineering	Team	FP26
	3	Engineering	Team	FP27
	2	Engineering	Team	FP28
	3	Engineering	Team	FP29
	2	Engineering	Team	FP30

6.2.1 Themes

The themes that emerged were analysed according to their importance in the discussion of the phenomena that is focused on in this dissertation. The key themes that emerged were conceptualised to answer the key research question of knowledge loss and then sub-themes were further conceptualised by addressing the sub-research questions. To make sense of the themes, two key measures were taken. They were firstly to enumerate the responses and secondly to group them into key themes and sub-themes. This enumeration supports the qualitative study because the research question attempts to identify the consequences for and impact on the organisation of knowledge loss determined from the analysis of the perspectives of each participant. Additionally, the analysis shows the strength of each perspective. Boyatzis (1998) posits that this frequency of occurrence method represents appropriate reliability. The formula is presented as:

$$A = (n/N).100$$

Where;

A is the percentage agreement on an experience perspective;

n is the number of subjects nominating the experience; and

N is the total number of subjects.

To illustrate the computation, consider Thematic Category: *Experienced Employees are Experts in the Organisation's Operations* as an example. Four (4) categories were clustered under this theme: (a) Departing employees have hands-on experience; (b) specialist knowledge is extensively applied; (c) knowledge is acquired through experience in different roles; and (d) the development of self and tested knowledge helps bring about success. These categories were identified based on the individual participant responses. For instance, the category *Departing employees acquire more hands-on experience* had 30 responses, which implies that 100% of respondents articulated that expertise is acquired through hands-on experience of the organisation's operations. The 30 responses were also derived from triangulation with the cadets and senior management who agreed with all the expert participant responses.

6.3 Perceptions of Knowledge Loss

Analysis of the interviews investigated the experts' perspectives concerning their knowledge and skills contribution, as well as on the impact their departure would have on the organisation. The process adopted for all emerging data was to categorise the key themes and the sub-themes.

These themes were then drawn into context. For ease of discussion, the themes are organised with the following focus. Importantly, however, it should be noted that the areas of focus are inextricably linked. Tables 11-16 summarise the thematic categories and their constituents under the following areas:

a) Authentic expert knowledge
b) Knowledge contributions
c) KM and support

6.3.1 Authentic Expert Knowledge

The key participants in this study, being experts, recognised that even though they had many years of experience, they were much more focused in their specialised area than in the whole organisation's operations. As discussed in the literature review in Chapter 2, experts are recognised for their continuous renewal of knowledge through their specific activities and the improvement that they bring to their roles. Through this experience, these experts develop a unique set of knowledge and skills that becomes authentic. Therefore, in this dissertation, 'Authentic Expert Knowledge' refers to the knowledge and skills that are demonstrated by the expert in their domain that is unique. 'Authentic Expert Knowledge' is significant and can be unique given the specialist nature of their work. All 22 experts indicated that they obtain more knowledge through hands-on experience in the varying roles they performed. Only a small number of them, however, listed specific areas that they believed may impact the organisation. The areas that the experts identified were: improvements to the plant so that it can function reliably (FP01); installation of crushing plants so that can benefit higher end processing (FP10); addressing the ongoing downsizing episodes and subsequent loss of expertise (FP11); having the right expertise to handle customer issues especially in damages during transit (FP12). Themes 1 and 2 demonstrate how expert knowledge could impact the organisation upon an expert's departure.

Theme 1: Experienced Employees are Experts in the Organisation's Operations

Table 11 displays the dimensions of knowledge that could be impacted upon the departure of an expert. These dimensions of knowledge were shared by the participants interviewed.

Table 11: Theme 1: Experienced Employees are Experts in the Organisation's Operations

Thematic categories/constituents	No. of participants to offer this experience	Percentage of participants offering this experience
Knowledge of inefficient business performance	4	13%
New ideas emerging from new personnel/employees	4	13%
Change of policies, procedures, and culture	3	10%
Good operational practices	2	7%
Shop-floor technical skills	30	100%

All the participants agreed they possessed strong technical shop-floor skills. Those who had been working for more than 10 years recognised their unique knowledge and skills. These experts were highly specialised in their field of work. A small number of them possessed wider organisational knowledge relating to the company's business performance. The participants attributed this organisational knowledge to Gothamfield's investment in rotating the workforce through a variety of roles. This strategy provided the participants with a unique set of contributions and insights into the organisation's holistic business performance. Through their experience in different roles, some experts explained how they became more aware of the organisational policies, custom, and practice. The experts tended to agree that by using acquired knowledge, they became familiar with the organisation's operations. Expert FP15 shares some insights into the ways that he gained knowledge through a variety of roles:

> Depending on the role you are doing, it's always important. But I think it's of more importance in certain roles. In certain operational fields where the pressure is on a business outcome ... proven experience becomes really important (INTFP15, L231–234).

The long-serving specialists, on reflection, saw that that their expertise was important for continuity. They recognised the knowledge and skills contribution where they felt they had made a significant impact. Mia offered her perspective on how her contribution is significant:

> It's probably more of my dedicated knowledge of the place. For instance, last week, we had a down day, which was like 32 hours, and I probably worked for at least 24 of those 32 hours just making the plant going and being there (INTFP03, L427–432).

In particular, some of the experts believed that the loss of knowledge and skill may result when there is lack of guidance on historical events. Pablo says: 'I think fresh ideas and fresh people are a healthy balance as long and you've got enough of the experience and knowledge to be able to manage that forward' (INT. FP10, L330-335). The view, that the cadets need guidance through mentoring so that the accumulated experience can be shared was widely agreed upon by the other experts and the cadets themselves. As one cadet says:

> … I tend to seek ideas from those with experience as they may have solved the issue before, I've quite a bit of respect for them because you can have a problem like, 'Oh we did something like this ages ago and this is how we fixed it.' And you're like 'You're kidding me. I've been sitting here for two days looking at this problem and no idea how to fix that and you just did it like that (INTFP22C, L628-631).

Summary of Theme 1: This theme emphasises the perceptions of expertise. Even though the participants recognized that the long-serving members had highly specialised knowledge and skill sets, they did not call them 'experts'. Through the narratives shared and their long span of service, as well as the intimate knowledge that the specialists demonstrated, they can be classified as experts. Ericsson and Smith (1991) contend that experts are knowledgeable in specific subjects and make decisions based on generally accepted principles in their disciplines. Thus, all the participants interviewed for this dissertation agreed that the experts' technical skills were critical. This agreement came from each expert's reflection and from others reflecting on the experts' ability to make decisions effectively and quickly. An important element of contributing in significant ways fits with Ericsson's (1993) description of experts gaining their expertise based on high levels of deliberate practice, where the expert builds a strong link with their performance output and their knowledge capabilities.

Additionally, this theme emphasises that both fresh and experiential knowledge is equally important to an organisation's continued sustainable success and innovation. Within this, there are those who are novices (whom we can assume are the ones with fresh knowledge) and those who are experts (whom we can assume are the ones with the experiential knowledge) (Olivera 2000; Schulz, 2001). As one cadet affirmed: '… when he[12] directs me on the job, we discuss why we're doing and what outcome we achieve, stuff like that, so that's when I learn best …' (INTFP23C, L474-478). Knowledge distribution in an organisation is complex. Therefore, a balance of those who have general knowledge and those who have significant experience in their fields is important for continued organisational performance.

[12] In this quote, 'he' refers to an expert.

Theme 2: Perceived Qualities of Experts

Many of the participants in this study associated their technical specialist skills and capability to perform well in their job with 'soft skills.'[13] Balaji and Somashekar (2009) assert that soft skills are crucial for engineers in a highly competitive world. Setting high expectations for their technical specialist work, the experts tied their positive experiences to their ability to demonstrate the following soft skills. These soft skills were mainly the ability to interact with people by caring for and motivating them. Table 12 displays the main constituents of this theme.

Table 12: Theme 2: Perceived Qualities of Experts

Thematic categories/constituents	No. of participants to offer this experience	Percentage of participants offering this experience
Commitment to self-development/learning new knowledge	22	73%
Possession of basic skills	21	70%
Good communication skills	21	70%
Good interpersonal skills	19	63%
Ability to work in team/team player	15	50%
Innate intellect	13	43%
Acquired empathy for people/care	10	33%

In their narratives, most of the experts shared how critical the soft skills are to their specialised roles. The soft skills complemented their technical skills in ways that gave the experts a sense of ownership and recognition of the fact that their knowledge and skills were critical to the organisation. The experts specifically connected the soft skills to their ability to communicate and have good interpersonal interactions at work. This sense of ownership was enhanced by their care to maintain good relationship with peers and colleagues. Furthermore, the experts' sense of ownership of these soft skills reinforced their significant contribution of knowledge to

[13] Soft skills are desirable qualities for certain forms of employment that do not depend on acquired knowledge: they include common sense, the ability to deal with people, and a positive flexible attitude. Soft skills are character traits, attitudes, and behaviours rather than technical aptitude or knowledge. Soft skills are the intangible, nontechnical, personality-specific skills that determine one's strengths as a leader, facilitator, mediator, and negotiator. Soft skills are character traits that enhance a person's interactions, job performance, and career prospects' (Robles, 2012; Parsons, 2008) Is this a direct quote? If so, please indicate where the quote begins using quotation marks (there are already quotation marks where the quote – if that's what it is – ends).

the organisation. The experts considered that having these soft skills helped to enable an effective performance at work.

For instance, the expert stories shared in Chapter 5 established qualities such as communication, interpersonal skills, and empathy. These qualities could be lost with the departure of the expert workforce. As expert FP04 says:

> I know how to get a result. I know how to approach. I'm into relationship building big time. I'm into getting to know people, I could tell you everybody on my team's footy team, their marital status, how many kids they've got, and what interests them (INTFP04, L201–203).

Another expert says:

> It depends on your commitment, what area, what you want to do, and what change you are trying to bring. Like some simple things you can say, just do this. If you are trying to make a change in direction, philosophy you got to communicate to them, initiate discussion, get their feedback, give them things, and that's just the start of it (INTFP06, L82–86).

The experts highlighted their soft skills such as interpersonal communication skills, ability to work in the team environment, empathy, and intellect. The cadets believed that the expert's soft skills were a critical enabler to their performance and connection at work. As one cadet remarked, it is an expert's way of communication that makes a difference: '… if I'm having fun, I learn a lot … the people I work with still have that fun attitude' (FP22C, L344-349). When asked what sort of mentor he learns best from, another cadet says: 'When I'm with someone who is good at talking to people, communicating, I think, I learn a lot from those kinds of personalities' (INTFP27C, L96-98).

Summary of Theme 2: The findings that emerged in Theme 2 find some support in literature about organisational commitment. The experts used the words 'dedication' and 'commitment' to highlight the way they perform (actions, decisions, and practices) in their specialised role. They attribute their technical success to soft skills. The experts' perception of soft skills arises when they are able to engage and effectively communicate with peers and colleagues. As Becker, Randal and Riegel (1995) note, an employee's desire to maintain employment with a continued willingness to perform at high level and to align with organisational values and goals, is a central feature of commitment. Additionally, Northcraft and Neale (1996) argue that commitment is attitudinal and reflects on the loyalty and the employee's expression of care for the wellbeing of the organisation.

Furthermore, motivation, as Stoke (1999) explained, is a human psychological characteristic that contributes to commitment. Likewise, Bennet and Bennet (2007) contend that knowledge is dependent on the potential and actual capacity of an individual 'to take effective action in varied and uncertain situations' (p. 28), which thus leads to the individual setting learning goals. The literature about organisational commitment suggests that commitment is essential for the survival and effectiveness of large work organisations. In sharing their perspectives, the experts have demonstrated that (in some fundamental way) they have been responsible for managing and maintaining the organisation's state of health that is necessary to carry on its work.

6.3.2 Contribution of Knowledge in Organisations

The clustering of themes under this key concept demonstrates that expert knowledge offers a significant contribution not just to the organisation's performance but also to its identity and culture. Recent work by Fiol and Romanelli (2012) has recognised that knowledge insights, deliberate practices, and capabilities are strategic resources. Tables 13 and 14 show the themes that have been classified under this concept.

Theme 3: Areas of Expert Contribution

Expanding further within the specialised technical work of the experts, the participants shared that the experts contributed significantly in the areas such as: mentoring, influencing positive work ethics, and helping to establish good practices within their areas. Table 13 below shows the categories that comprise Theme 3.

Table 13: Theme 3: Areas of Expert Contribution

Thematic categories/constituents	No. of participants to offer this experience	Percentage of participants offering this experience
Mentoring cadets/new employees	30	100%
Offering innovations/innovative ideas to business operations	28	93%
Demonstrating a positive work ethic to new employees (commitment, dedication)	23	77%
Establishing operational practices	13	43%

For the majority of the participants, knowledge-sharing practices include mentoring, offering innovative ideas, and demonstrating a positive work ethic. For most of the participants, a huge loss of knowledge will result if contributions in these categories do not continue. The main contributions that the experts believe assist with knowledge transfer are mentoring cadets, guiding new ideas for innovation of new entrants, and educating new entrants on good practices. The experts feel that this guidance enables new entrants to understand the history of what they did and why. Experts also noted their dedication or commitment to serve the organisation, as Expert FP01 says:

> I see myself as someone who is not necessarily the best at a million things, but doing a reasonable job at a wide breadth of experience rather than a really good job at a really deep level of experience. So it would need someone, it would seem someone who's dedicated to it. Rather than knowing how to do all these spiffy engineering things, just the dedication (INTFP01, L395–599).

The experts saw themselves as leading by example. All of the experts interviewed for this dissertation noted that they were able to guide and motivate new employees in their roles. They believe that through motivation, new employees would be able to perform their roles efficiently. Pablo states: 'I know how to get a result, I know how to approach the young ones' (INTFP04, L201–203). He also says:

> It takes a lot to manage a business or a group of people and that you don't specifically yourself have to have the skills of those people. You just need to be able to coach and encourage and support and develop the people that are running the business or doing whatever needs to be able to make sure that they do their job well (INTFP10, L101–198).

Eric believes that the art of any management skill is to know the people who work for and with you. He describes his current role as a mentor thus: 'Teaching people how to manage others and how to think. Why people think the way they think' (INTFP04, L138–139). Most of the experts interviewed were bound by their views on passing on knowledge. The experts felt strongly that work ethics, especially those demonstrating commitment and dedication, were characteristics that they wanted to share with their team and the cadets.

Summary of Theme 3: The emergence of the categories above in this theme reinforces how the experts and the others interviewed saw meaningful contributions within the experts' specialist areas. The experts themselves associated these contributions with their ways of demonstrating dedication and commitment to the organisation. Further to that, the experts expressed an enthusiasm for innovation and new ideas. This finding is supported by studies by

Stevenson (2003), Hustad (2004), and Koedinger (2014), who identified that an expert's key capability involves recognising familiar situations and interconnecting meanings gained from their experience and domain-specific knowledge, so as to solve problems in a creative way. This creative performance and ability to tap into experience and solve problems, as Bass (1985), Sandelands & Buckner (1989), Csikszentmihalyi (1990), and Mainemelis (2001) claim, is peak performance.

The themes that emerge in this section also find some support in studies by Schon (1978), Bass (1985), Fiol and Lyles (1985), Prahalad and Bettis (1986), Argyris and Collins (1993), and Blackler (1995). These studies suggest that an individual's knowledge is dependent on cognitive abilities that allow for the recognition of underlying patterns and assumptions, and for these to be synthesised into a solution. This knowledge manifests itself, through the individual's experience, as 'performance' for the organisation. Their performance is exemplified through their practice actions and judgements which, in turn, are informed by their values. The experts regard this knowledge and these capabilities to be assets, as they are believed to benefit the organisation and, moreover, they provide the experts with considerable personal satisfaction. Sanchez and Heene (1997) argue that knowledge assets are valuable to the organisation because knowledge is time-, space-, and context-relevant. The experts in this study demonstrated that their knowledge was contextual and continuously changing with time and space, and as the organisation was strategically shifting.

Theme 4: Perception for Organisational Improvement

The immediate backward-looking response that most participants offered when asked what they felt about organisational improvement in relation to knowledge retention, was the need for a system. The 'system' that they described was identified as a knowledge database and a recordkeeping space. Table 14 below shows the two main categories that emerged.

Table 14: Theme 4: Perception for Organisational Improvement

Thematic categories/constituents	No. of participants to offer this experience	Percentage of participants offering this experience
Establishment of database	29	97%
Recordkeeping of good operational practices	29	97%

A majority of the experts emphasised the need for organisational data management. The current database had been introduced to the organisation one year prior to the interviews, and was rarely used. The reason for this lack of use was that except for the management participants interviewed, the experts could not see the benefit of the database. Moreover, experts claimed that this database diverted their attention from doing any of their 'real' work. They saw it as involving a tedious task of documentation, and there was a widespread sense that no-one would ever read this documentation. The experts felt that the organisation already knew what they were doing and there was no need for this detailed record-keeping. When asked to elaborate on what type of databases they would recommend, a majority of the experts wanted something where they could explain what they did, how they did it, and why they did it. The findings suggest that the experts were keen to prevent or minimise the negative consequences of knowledge loss. Thus, their immediate reflective thought was to recommend an organisational data management system. Many of the experts agreed that a system of some sort was needed, especially to track historical data. When asked about recommendations for organisational improvement, the employees included the establishment of a database and formal record-keeping of good operational practices. Expert FP03 says:

> So, the important thing about any information you have got is to store it in a method that people can retrieve it and so any information … I have made sure it goes into engineering records and that it is searchable and that you can find it if you are looking for it (INTFP03, L98-143).

Expert FP06 says:

> I think some of the process mileage knowledge needs to be preserved because we seem to keep relearning it over and over again. We have problems with keeping our long term records (INTFP06, L59-78).

Expert 11 says:

> … a lot of effort goes into financial reporting and performance reporting … but it doesn't really give you that statistical knowledge which enables you to understand what the true problem is (INTFP11, L368-379).

Summary of Theme 4: With regards to this theme, the experts all recognised that a system of some kind was required, even though they were not clear on the technological aspects of this system. The experts were also keen to ensure that historical data was captured and preserved. They argued that a system to improve the efficiency of their work was needed. In terms of preferences for personal communications over electronic communications, both experts and

cadets shared the view that a system to capture contextual knowledge was important, but that their social shop-floor face-to-face contacts were equally important.

In mapping the terrains of organisational culture, Sackmann (1991) argues that the major shortcomings of a KM technological system include the ability to embody an individual's cognitive, behavioural and social practices. Brodie and Mylopoulos (2012) argue that current database technology lacks both knowledge representation and reasoning capabilities. Equally, scholars in the KM field have argued that knowledge culture and motivation around willingness to engage and share are the key drivers for any KM system (Oyefolahan and Dominic, 2013). These theoretical positions suggest that every organisation requires a specific system that suits the practice and workplace culture and that ensures the ongoing capabilities for organisational performance. These cultural factors become especially critical when faced with the challenges posed by the ageing workforce.

6.3.3 KM and Support

As discussed in Chapter 2, KM literature demonstrates that knowledge and managing knowledge can be supported mainly through having a knowledge culture in the organisation and motivations to learn. Additionally, given the backdrop of the ageing workforce, scholarly work is increasingly demonstrating that it is critical to capture expert cognition for the transfer of knowledge, as well as for support in managing knowledge. Tables 15 and 16 discuss the key themes that arise under this conceptual area.

Theme 5: Learning by Experts

A majority of the participants associated knowledge and knowledge loss with learning. They associated learning with commitment, dedication and learning from experience. The experts believe learning helps shift thinking and interactions. Kofman and Senge (1993) argue that learning environments can penetrate through organisational assumptions and habits, and assist in transformation of the organisation to continue to be competitive. Table 15 shows three strong constituents to learning.

Table 15: Theme 5: Learning by Experts

Thematic categories/constituents	No. of participants to offer this experience	Percentage of participants offering this experience
Commitment to learning	28	93%
Dedication to serving the organisation	28	93%
Application of knowledge learned in previous experiences	25	83%

The perceptions gathered from the participants established that learning in Gothamfield is viewed as an important process of change within the individual and the organisation. In particular, the experts reported that learning enabled them to perform more effectively in their roles. They also reported that learning showed a sense of dedication and commitment to the organisation and vice-versa.

Further insights shared by the experts showed that they were that they engaged with learning in both structured and unstructured ways. They perceived the structured learning programs offered by the organisation (for example, Six Sigma and the opportunity to upgrade or maintain their engineering qualifications) to be important. The experts agreed that the organisation's interest in their professional development, coupled with the experts' own willingness to engage in continuous learning, was an indication of commitment. Unstructured learning was also considered important by the experts. Unstructured learning transpired mainly on the shop-floor, and was mostly conducted when workers were trying to troubleshoot issues.

Another form of learning that was carried out by the experts was experimental learning. The experts voiced that they pursued learning that was self-initiated where they felt the learning would help them perform better in their jobs. For example, Expert FP10 wanted to learn about other blast furnaces around the world in order to benchmark Gothamfield's blast furnace. The expert found an organisation in Europe that could visit Gothamfield for study purposes. The expert then proposed this study initiative to the organisation. Gothamfield supported this study program.

The experts also reported that they were keen to take on work assignments within the organisation where they were able to leverage on their established organisational experience and also embark on learning new things. As Expert FP09 said:

> In my 19 years here, I spent 14 years in steel making, and a lot of my movements have been in steel making, either in a project role or progressing through the management roles. I then moved on to the castor operations. So I've gone from engineering to maintenance to operations. From a learning perspective and opportunity within the business, I see a lot of transferred ability between people who are not necessarily just engineers and who stay engineers. So I've been fortunate in terms of having worked in engineering, maintenance, technology and operations and having exposure to product management and more so in terms of supply chain or planning (INTFP09, L242–275).

Summary of Theme 5: The themes that emerge in this section support the view that organisational learning needs to be varied, flexible, and suited to each individual or employee. When learning is self-determined, the emergent factor is *autonomous motivation to learn.*[14] Autonomous motivation is self-identified, has self-directed goals, and is intrinsic in nature (Stone, Deci, & Ryan, 2009). According to Ryan and Deci (2000), self-determination is the main motivating factor that drives behavioural culture. From a technological perspective, Malhotra, Galletta, & Kirsch (2008) argue that encouraging autonomous motivation might be the suitable socio-technological approach to gain individual motivation and commitment to engage with KM systems.

Realising the learning culture within Gothamfield, where the organisation supports flexible learning approaches, the experts reported that they sensed Gothamfield's commitment when it supported the experts' learning initiatives. Kofman and Senge (1993) contend that learning environments create a shared vision. Furthermore, Collinson and Cook's (2007) report that when individuals show commitment, the key action or outcome involves them engaging in learning and then using that learning to transform the organisation. In more recent work, Balay (2012) offers further evidence that learning demonstrates an employee's involvement with the organisation and creates an internalisation by engaging with the *workworld*. According to Balay, when employees internalise, there is desire to stay with the organisation. From a KM viewpoint, studies by McKenzie and van Winkelen (2004) and Oyefolahan and Dominic (2013) suggest that learning involves the absorption of the practice culture with the aim not only of refining an individual's domain knowledge, but also of effectively using the KM systems.

[14] Studies in self-development theory have shown that giving an individual autonomy allows that individual to identify with their value. The individual then tends to experience a sense of volition and self-endorsement of their actions (Ryan & Deci, 2000). 'Autonomous motivation to learn' shows that an individual's cognition, behaviour and social engagement is a complex mix, and one that an organisation should recognise.

Theme 6: Organisational Strategies for Addressing Knowledge Loss

Long-serving experts in an organisation hold unique knowledge, skills, and attributes. Their shared perspectives and insights help identify both where knowledge loss may potentially impact an organisation, and also the strategies that the organisation needs to address that loss. Table 16 highlights the experts' perspective on 'Organisational Strategies for Addressing Knowledge Loss'.

Table 16: Theme 6: Organisational Strategies for Addressing Knowledge Loss

Thematic categories/constituents	No. of participants to offer this experience	Percentage of participants offering this experience
Established cadetship/on-the-job training/mentoring program	28	93%
Provision of training and development programs for employees	28	93%
Conducting and implementing a sustainable organisational structure	6	20%
Provision of programs/activities that motivate employees (training, forums)	4	13%

Experts proposed knowledge retention strategies mainly in the mentoring of cadets. The experts' experience made it clear that passing on their knowledge about the history and nature of the plant operation and process know-how was critical to the cadets. The participants who were interviewed reported that the mentoring that was in place needed a continued investment by the organisation.

Furthermore, there was consensus that the organisation needed to focus on programs that would increase the skill base of the remaining workforce. Some experts reported that, based on their experience, multi-skilling[15] was important. Most experts reported that they were multi-skilled and that this might represent a potential knowledge loss when they depart. They believed, however, that this potential loss could be addressed through the mentoring programs. As Expert FP16 said: 'I put energy into developing an operator's model to up the skill of the remaining workforce so that they have multiple skills' (INTFP16, L260). Participants also considered the

[15] Multi-skilling means possessing a range of skills that are directly and indirectly relevant to the technical aspect of the job at hand.

provision of training and development programs for employees to be an organisational strategy to replenish the probable knowledge loss. To transfer knowledge, Expert FP04 stated:

> I'd say it's new knowledge on how they should manage certain situations. I've been through the management development program. I've been very fortunately exposed to some very good people who taught me skills and how to manage people. I've still got all the manuals. Actually, I don't refer to the manuals. I refer to the notes I took and the handouts that he gave. I refer to those things all this time. Teaching people, how to manage people and how to think. Why people think the way they think (INTFP04, 131–138).

Participants correspondingly shared the view that programs or activities need to motivate employees in knowledge-sharing. According to Expert FP26:

> My learning style with people very much is that I don't do it for them. I'll offer advice, assistance and support and as they stumble a little bit I'll help them along the path, but I'll never give them the answer or otherwise they don't learn. They need to show they are motivated to learn (INTFP26, 228–230).

Summary of Theme 6: This theme highlighted that most of the experts not only understood that their continued learning was critical to their performance, but saw that imparting their knowledge was essential from the organisation's perspective. They recognised through reflection that their long service, transfer of their capabilities, and multi-skilling was where they held deep expertise. The experts also recognised that those employees who demonstrated self-determination and engagement in their own learning were keen to impart their practice sense-making to the cadets. This sense-making becomes part of the organisational practice of the know-how and know-what. Sense-making can be viewed as knowledge held in time and space, which once again demonstrates how the experts view historical knowledge as an important knowledge that can be transferred to cadets through mentoring. Reviewing the literature shows that playing the role of a mentor involves taking on a leadership role and that it positively relates to knowledge-sharing (Von Krogh, et al., 2012). Though not explicitly voiced by the experts, the underlying consensus amongst the experts was that it was essential for cadets to be mentored in the organisation's contextual cultural knowledge.

6.3.4 Unexpected Insights

Apart from the themes above, the participants also provided some unexpected insights. A majority of the experts commented on their job titles and how little these reflected what they actually did. Given that the title did not reflect the true nature of what they did, the title meant

little to them. They expressed that they were more interested in the challenge of the work than a job title.

When asked to comment on the organisation's processes, many suggested that the quality of organisational leadership could improve. They took some consolation, however, from the fact that the organisation was continually restructuring, and thus that change of leadership was inevitable. There were a few who did express their views that the regular 'downsizing' and 're-recruitment' needed to stop as they found them disruptive and probably impacting the organisation more than realised. When questioned to elaborate on this further, most of the experts responded similarly, saying that 'good people leave and that leaves a gap.'

Despite knowing that they held qualifications, experience and unique capabilities that would be attractive to competing organisations, the experts were not interested in leaving Gothamfield. There was a sense of 'contentment', 'belonging', and 'comradeship' that came through the observations and underlying comments that were made in the interviews. Also, most of the experts interviewed belonged to the baby boomer cohort. Most reported that they would work until retirement. Some also reported that they had already begun to make retirement plans. One expert for example shared his goal after retirement: 'I recently did financial planning studies, an alternative career path when I retire' (FP11, L553).

When the experts were asked to share their views on how the organisation might be impacted when they departed, the immediate response from most of the experts was: 'I will not be missed'; 'I can be replaced'; 'no one is irreplaceable'; 'we've seen many leave before.' These views changed when they were probed and they reflected on their contributions. The values that they shared were captured in Themes 1 to 6. The initial thoughts shared by the experts, however, left the researcher with questions as to why they 'undervalued' themselves.

6.4 Chapter Summary

As society moves towards a knowledge-based economy, the nature of work is changing (Drucker, 1993; Sveiby, 1997; Davenport & Prusak, 1998). Knowledge is becoming the centre of an organisation's life, given the challenging backdrop of the ageing workforce. The themes addressed in this chapter provide an in-depth understanding of the experts' perceptions of knowledge contribution and loss. The thematic analysis probed the rich data and facilitated clustering of the findings. The analysis of the data collected to answer the research question in this dissertation demonstrates that experts contribute significantly to the organisation's performance and culture. Chapter 7 will conceptualise the analytical findings in terms of what knowledge loss Gothamfield will face based on the experts' perspectives.

CHAPTER 7 – TOWARD A CONCEPTUALISATION OF EXPERT KNOWLEDGE LOSS

7.1 Introduction

Managing knowledge is not just about managing processes; it also embodies values, beliefs, skills, and capabilities that enhance organisational performance (Nonaka, 1994; Alavi & Leidner, 2001). Over time, this knowledge becomes an asset that is expressed through the individual's work actions and commitment (Grover & Davenport, 2001). Through this emphasis, the dissertation has examined the complexity of the knowledge held and contributed by experts within their *workworld*.[16] As organisations grapple with how to manage knowledge as 'one [employee] walks out of the organisational door', there is a need for a KM framework that conceptualises knowledge transmission. This dissertation's findings contribute to the KM literature and the SECI KM framework. This chapter is organised around three key concepts: expert knowledge, knowledge contributions, and the presence of KM and support.

7.2 SECI KM Framework: The Lens for Conceptualising Knowledge Loss

The purpose of using Nonaka and Takeuchi's (1995) SECI framework for the dissertation's analysis is that the research questions aim to understand what significant contributions the experts have made to the organisation, and whether their departure would have consequences for the organisation in regards to a loss of knowledge. This framework helps build a conceptual understanding of the perspectives of knowledge contribution and loss and the potential impact within an organisational setting. The SECI KM framework displays two key types of knowledge which embodies all the other types of knowledge that scholars have attempted to dissemble (See Chapter 2, Table 2); tacit and explicit knowledge. Moreover, the framework illustrates how knowledge can (through a well-defined process) be created and recreated to sustain and improve organisational performance.

Each quadrant of the framework focuses on the synthesis between tacit and explicit knowledge, magnifying the level at which the type of knowledge is present, either at the individual or the group level. Additionally, this framework connects the individual and group to systemise an approach that allows exploration of expert knowledge within an organisation. The principles of the SECI KM framework underpin the individual contribution and growth of experience. The

[16] The researcher has coined the term 'workworld' to describe as a way of presenting how experts connect, interact, and experience their workplace environment and the situations with which they deal through their responsibilities, tasks, and activities.

model also underpins the sharing of experience and knowledge of and by experts in an organisational context. Expert testimony (as provided in the case studies) revealed that experts disseminated their experiential knowledge through contributions to domain-specific knowledge and mentoring activities. The experts' testimony also suggested that feelings experienced in their practice and *workworld* occurred in all four quadrants of the SECI KM framework.

The unique feature of Nonaka and Takeuchi's (1995 and 2004) SECI KM framework is that it emphasises that knowledge is a resource that needs to be created and continuously recreated for an organisation to be competitively sustainable. This framework also explicates the dynamism in the creation of knowledge and management processes, where stocks of knowledge flow in 'knowledge spaces', which describe the process of knowledge creation and encouragement of knowledge sharing between individuals and groups.

The SECI model has been applied in a wide variety of contexts, in both Asian and Western organisations. This model is primarily used to determine an organisation's stocks of tacit and explicit knowledge; the flow through the creation process; and the creation and transfer of knowledge at the individual level through to the more complex perspective of the organisation. The framework helps understand where expert knowledge and attributes are most apparent within the organisation's management systems and processes.

The SECI KM framework is thus pivotal for connecting this dissertation's focus on knowledge and the role of expert knowledge interactions within the organisational context. This framework also assists an appreciation of the complexity of knowledge contributions and losses, which are intertwined in individuals' practices and processes. Figure 6 relates to the key research questions in that it provides a framework for the experts to examine their knowledge contribution and loss in the *spaces*[17] where they work. Further, tacit and explicit knowledge bear strong relations to an individual's contribution toward the business performance of an organisation.

[17]The researcher has used the term 'spaces' with the SECI Model to frame the areas of contribution known as 'knowledge spaces'.

Figure 6: The SECI KM Framework

Socialisation (Tacit and Originating) *Individual Knowledge Space*	Externalisation (Dialogue and Sharing) *Shared Knowledge Space*
Internalisation (Exercising and Learning in Practice) *Individual and Shared Knowledge Space*	Combination (Explicit and Systematising) *Individual Knowledge Space*

Source: Nonaka and Takeuchi, 1995

In applying this SECI KM framework, the experts' knowledge and skills contribution are seen in each quadrant and understood from where the perceived loss may stem. For instance, in the **Socialisation Quadrant**, the expert displays socialisation through his or her interaction with this *workworld* and primarily engages in a tacit way by building his or her own domain-specific knowledge. The **Externalisation Quadrant** illustrates a shared space in which colleagues and cadets engage on the shop-floor principally during practice routines. Both parties engage in dialogues on practices and improvisations. The **Combination Quadrant** illustrates spaces where experts begin to formalise knowledge through report of processes adopted and notes about critical incidents. Thus, the organisation's record-keeping processes convert knowledge from tacit to explicit. Finally, in the **Internalisation Quadrant**, the experts demonstrate how they engage in learning, mostly on an individual self-development basis. Collectively, the four quadrants highlight how peers communicate knowledge through success stories and other types of sharing.

The first sub-question aimed to reveal what the experts' knowledge and skills mean to them as individuals. This question forced them to reflect deeply on their own personal knowledge and skills, as well as on the ways that they contributed knowledge and skills to the organisation through their roles. Furthermore, this question explored the experts' understanding of the significant contributions of domain-specific knowledge associated with contextual organisation-

specific knowledge. This question was designed to reveal insights about the nature of tacit knowledge in the SECI KM framework.

The second sub-question examined the experts' perspectives on how others valued them. This question enabled them to reflect on their connections, areas of contribution, and events that they perceived to be valuable within the organisation. Many of the experts reflected on critical events that took place when the plant faced major issues. Some of these reflections related to the past when there was a crisis that led to the closure of the plant. They also reflected on the departure of a number of experts as a result of a recent downsizing exercise. This left a significant gap in the company's knowledge space.

The final sub-question elicited experts' perspectives on the significant contributions and impacts to the organisation upon their departure. Additional probing involved asking participants to share a success story that they believed would inspire future generations who join the organisation. This sub-question sought to reflect on the experts' self-perception of their knowledge contribution, such as their beliefs and their organisation value. These three concepts— namely authentic expert knowledge, knowledge contributions, and the presence of KM and support— are discussed in the context of the experts' *workworld*.

7.3 Authentic Expert Knowledge

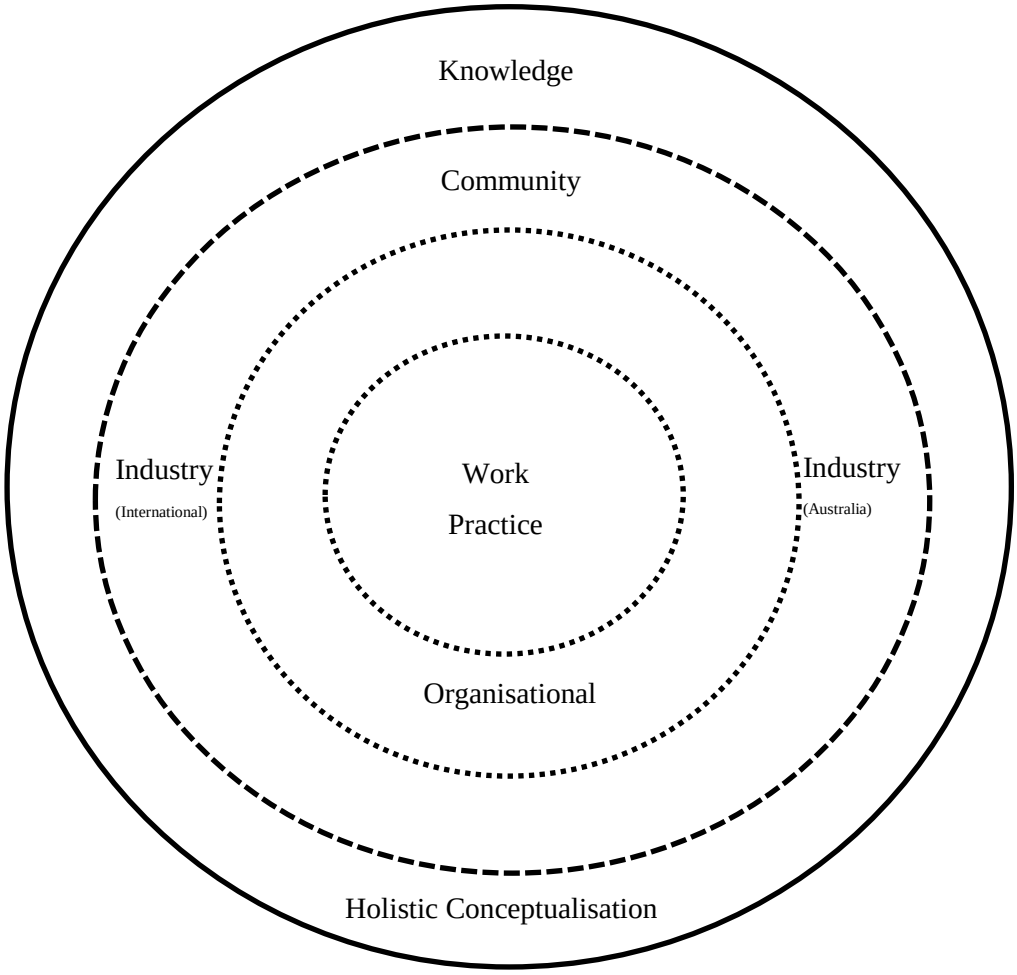
The term 'authentic expert knowledge' is guided by the theoretical principles of domain-specific knowledge (Chase & Simon, 1973; Chi et al., 1988; Ericsson, 2003), self-determination theory (Ryan & Deci, 2008), expectancy theory (Vroom, 1964), and the influence of the organisational culture (Ackerman & Humphreys, 1990; Fisher, 2002; Brislin et al., 2006). The combination of these cognitive and intrinsic capabilities with sense-making driven by individual motivation is what makes an expert's knowledge authentic. The findings reported in Chapter 5 show that the experts (who were mainly engineers in the mining industry) did not confine their knowledge contribution to their specialist fields (i.e. practice space) but rather contributed ideas on, insights into, and guidance for business performance. Moreover, the experts understood the difference between sustainable and unsustainable *workworld* practices, and supported the organisational renewal program of recruiting cadets by mentoring and sharing knowledge.

Expertise, thus, is a fluid mixture of cognitive, social, and personal variables. Social and personal variables such as culture, value, viewpoint, relationship, motivation, and sense-making interact with domain-specific knowledge and skills. Experts make sense of their *workworld* by interpreting the interruptions, influences, and personal knowledge of routines (Louis, 1980; Sackman, 1991; Weick, 1995). Given that sense-making typically draws on personal and social

variables, it can be assumed that decision-making and judgments vary from expert-to-expert. Thus, knowledge held by individuals is unique. The expert's unique knowledge capability is functionalised and culturalised between the individual and their natural settings. This construction of social interaction and considered actions in carrying out their work, illustrate how the experts make interpretations of their *workworld*. Expert testimony provided in this study delivers support for the idea that the experts display more than just practice knowledge. Experts' tacit knowledge comprises their domain-specific knowledge, which is utilised for purposeful practice within the organisation. The experts demonstrated how they make the tacit explicit by engaging with their mentees and sharing stories on the shop-floor.

The sections that follow draw on the areas of this significant contribution that might be lost when experts depart. The conceptualised argument here on using the KM SECI framework as a lens aims to assist in disembedding the experts' knowledge from practice that it is messy and fluid into structure in their *workworld*. Arguably, it is difficult to disentangle knowledge and practice in the everyday *workworld*. Figure 7 illustrates the key elements in the engineers' *workworld* that contributes to their holistic significant knowledge.

Figure 7: Experts' *Workworld*



The core inner circle (Work Practice) shows that the experts contribute when their knowledge, skills, and continued learning fit the organisational culture and meet the organisational performance outcomes. This exchange of their unique contributions mutually interacts with their situated practice. The outer circle (Industry and Community) represents the social exchange contexts of their tacit knowledge with external relationships. This is consistent with the argument posed by Alexander (1974), Nonaka (1991), Pattriota (2003), and Panahi et al. (2012) that tacit knowledge becomes available in explicit form when it is organised and diffused through the interaction between the individual and organisation. As experts shared their stories within the workworld, they demonstrated interaction that was strengthened by their relationships, especially in the communities in which they reside. Indeed, the experiences of these experts is continuously shaped by their knowledge, experience, and 'deep smarts' embedded in the organisational context, as well as in their interactive social relationships and networks.

Further to this holistic illustration of the experts' *workworld*, the analysis of the experts' knowledge discussed in Chapter 5 also supports Palonen, Hakkarainen, Talvitie, and Lehtinen's (2004) argument: specifically, that deep expertise is individually held and that experts know the cultural boundaries of the organisation, which allows them to make suitable organisational decisions. The experts in Gothamfield reported that the experience that they had gained from learning and connecting with the plant meant that they were able to troubleshoot issues in a short timespan and meet organisational standards. Having said this, they found it hard to articulate exactly how they performed in their practice to achieve this successful peak outcome, little realising that they were demonstrating peak performance and that this was a valuable contribution to the organisation (or only making this realisation on reflection). This resonates with Sfard (1998) and Wenger's (1998) argument that knowledge is a complex web of intricate cognitive, emotional, and unique personal structures and performance efforts that connect with industry and community, and that define the experts' expertise. Additionally, organisational expertise is a continuous learning process that builds on experience. This learning process synthesises knowledge of sustainable and unsustainable practices.

The section below discusses the link between the *workworld* and the SECI KM framework. Within the core of their *workworld,* the experts demonstrated that their 'Practice', brought participation and creation through using tacit and explicit knowledge in all four quadrants of the SECI KM framework. Figure 8 summarises the key ways in which they engaged in a transfusive and permeable discursive paradigm in each quadrant:

Figure 8: Dialectic Spaces in Gothamfield

Socialisation (Tacit) (Self-awareness of Domain-specific Knowledge and Practice Capabilities) Experts *Strong*	**Externalisation** (Tacit to Explicit) (Dialogue and Sharing) Experts with Experts and Cadets: Mentoring and Shop-floor Conversations *Potential to Improve*
Internalisation (Tacit from Practice) Experts and Self-Directed Learning *Strong*	**Combination** (Explicit to Explicit) Experts Documenting on Processes *Weak*

Source: Adapted from Nonaka and Takeuchi, 1995

a) The activities in the **Socialisation quadrant** illustrate that all of the participants had accumulated knowledge in their domain-specific and organisation-specific practice areas. They demonstrated strong tacit knowledge, especially when they shared their stories of when someone new joined the organisation. Their reflection made them realise that their knowing was hard to express, with uncertain phrases use such as 'I am the solution' (FP01, L534) and '… background in Engineering … in being able to pull all that together' (FP10, L78–81). When asked to explain in more detail, they struggled; however, to suggest how their practice knowledge 'worked'. The most they could express was that they knew how to handle issues and make decisions (both domain-specific and practice knowledge). Their stories demonstrated the depth of their practice knowledge, especially in times of crisis, which ensured efficiency and business performance were not compromised.

b) The activities in the **Externalisation quadrant** illustrates the process of converting tacit to explicit knowledge, as mainly demonstrated in shop-floor conversations and in the formal mentoring system in which some experts were engaged. This system is an area in which the experts were not fully transferring or sharing their knowledge; however, their shop-floor conversations led them to engage with their groups on

different shifts. Indeed, they felt positive about sharing their practices, especially their practice knowledge, with the cadets.

c) In the **Combination quadrant**, the systemising approach to capturing and applying explicit knowledge was identified as another weakness. The experts identified the existence of databases, but clarity on what these databases were or what they could be used to improvise was low. The reports and process records demanded by senior management were considered by many of the experts to be tedious and/or useless practice-related work. There was clear evidence from the interviews on the initial reluctance and inability to see the potential for a dynamic KM system that could depict and solve problems.

d) The experts were constantly involved in the **Internalisation quadrant**, a space for learning and acquiring new knowledge, as part of their practice. They applied several self-learning strategies such as reflecting on problems and past ways of addressing issues, experiments, courses, or programs supported by the organisation, conducted, either in-house or externally. In terms of synthesis, this quadrant showed that the experts had deep roots in motivating and cultivating their tacit knowledge. In particular, it demonstrated how their feelings and emotions in their *workworld* acted as a stimulus for learning.

By applying the SECI KM framework as a lens, the knowledge capability exchanges that occur in practice can be identified. Furthermore, this lens also helps conceptualise the tacit and explicit knowledge that occurs in each quadrant. The quadrants show how the expert's deep-rooted motivation to engage in improving their performance through constant learning demonstrates their competency. The findings in this dissertation show that the experts had strong practice *knowledge capabilities*[18] in two key areas: operations and learning. In operations, they demonstrated expertise in knowing the unsustainable work practices in the business that contributed to its inefficiencies. Additionally, they demonstrated their knowledge of the organisation's culture, policies, and procedures. With regard to areas of learning, the experts contributed significant innovative ideas and created a guiding and learning environment for new cadets. Each expert had strong tacit knowledge, within operational knowledge, in his or her specialised area.

As Dror (2005) and Dror and Charlton (2006) argue, when compared to novices, experts have an ability to realise their failures, learn to improve, and successfully apply their experiential

[18] In this dissertation, the term 'knowledge capabilities' is defined as a set of complex knowledge-specific skill sets that an individual holds. The contribution of knowledge capabilities may be identified through shared stories, processes, and decision-making. The outcome of knowledge and skills in practice is a demonstration of an individual's competencies that holds the proficiencies and experiences. Knowledge capabilities contribute to the competitive advantage of the organisation.

knowledge to their judgements. The following sections provide information that has been gathered from the findings, and discuss the flow and exchanges of the experts' knowledge.

7.4 Knowledge Contribution in the Organisation

Knowledge is an organisation's strategic and critical resource (Barney, 1986 and 1991; Barney & Ouchi, 1986; DeNisi, Hitt, & Jackson, 2003). Human capital resource studies suggest that individuals with developed domain-specific specialism and extensive prior experience are able to generate more abstract principles (Dalziel, Gentry, & Bowerman, 2011; Khanna, Jones, & Boivie, 2013). The experts' practice knowledge, contextual knowledge, cultural intelligence, and commitment are thus key conceptual components that can enrich our understanding of their knowledge contribution and our appreciation of its potential loss upon their departure.

The beginning of recognising the knowledge contribution of an individual in an organisation is through their role description and responsibilities. All the experts interviewed claimed that during their years of work at Gothamfield, they faced a number of changes in their titles. Some connected with the title and their role, however, most did not connect with the title but carried on what they believed their role was within their *workworld*. Apart from this, almost all the experts claimed either they did not have a current position description or had never had one at all. Thus, the lack of position descriptions does not seem to have had an impact on experts' knowledge capabilities or on their demonstrated enthusiasm to engage in ongoing learning activities (much of which was self-motivated).

This dissertation suggests that experts, in their *workworld*, contribute to their organisation through sharing during decision-making under pressure. They also share their *knowledge capabilities* by mentoring the cadets to improve in their practice performance. The majority of the participants agreed that the success of the organisation's mentoring program was due to the expert's soft skills ability in connecting with their mentees. The interviews with the cadets confirmed that that an expert and cadet knowledge differ in extent and structure; an expert's concepts are distinctly organised, his or her memories addressed through concepts, contexts, and contents. The contribution that the experts' made was their ability to draw inferences from the domains of expertise and human cognition, social influences, and abilities. Studies have shown that although experts are not always accurate, they are competent and have a greater tendency to obtain successful outcomes than cadets (Dror, 2005; Dror & Charlton, 2006; Ericsson, 2006b). As Chi (2006) notes, 'Experts have more accurate self-monitoring skills in terms of their ability to detect errors and the status of their own comprehension' (p. 24). Simon and Chase (1973) argue that experts increase their knowledge by learning patterns that appear in similar situations and by improving on encountered experiences. Chi, Glasser, and Rees (1982)

assert that ‘experts are more successful at choosing appropriate strategies to use than cadets’ (p. 24).

Additionally, Leonard and Swap (2005) claim that experts ‘access their vast archive of knowledge and select a small number of high-quality responses — quickly’ (p. 52). Sassower (1993) asserts that expertise is ‘nothing more or less than the ability to replicate past successes and modify past failures’ (p. 5). This reinforces the dissertation’s finding that the experts, by spending time learning and experiencing, have strengthened their domain knowledge. The learning the experts engaged in was also created through practice. Practice within the context of the organisation creates learning trajectories but also allows the professional to review the complexities of the practice for improvisation (Eraut, 2004; McKee & Eraut, 2012). As the level of confidence builds, experts become more competent and thus are more likely to obtain successful outcomes (Choo & Johnston, 2004). This ability can be attributed to their specialised knowledge and acquired skills, which are based on experience, rationality, and decision-making in a social context.

As learning and practice is continuous, it suggests that tacit knowledge scales to the next level of being intuitive (Smith, 2001). In particular, tacit knowledge is individualistic and developed through self-experience (Wagner & Sternberg, 1991a and 1991b). As Klein (1997) affirms, self-experience occurs when experts are reflective and when they search for practical opportunities to improve their levels of expertise. Improvisation made through practice and the knowledge brought through learning is another knowledge contribution the experts have demonstrated at Gothamfield. This was confirmed through the stories and spontaneous anecdotes shared by the experts, which suggests that their tacit and explicit knowledge is continuously renewed to meet changing needs, making their knowledge contribution valuable to the organisation. Expert FP10 said that he is ‘understanding enough about our mining operation to be able to know what I can deliver and what I can’t and what it takes to deliver that and recording that’ (INT FP10, Line 97). Expert FP07 said that

> it’s one of the problems that you always have with bringing new people in is that if you don’t get that experience or systems in hard copy somewhere so they can read it and they have to make their mistakes. You know to move forward, we are trying to do that a lot differently (INT FP07, Line76-80).

A key *knowledge capability* and significant contribution that the experts make as seen through the case studies was drawing on their domain-specific knowledge. Domain-specific knowledge is gained by cognitive engagement and learning in a field of study. This structure of knowledge is influenced by memories and problem-solving, and by the insights and wisdom gained from

the comparison of perspectives. Experts build expertise by connecting the meanings gained from their experiences with their domain-specific knowledge; in this way, they perform tasks with little or no risk and creatively solve problems. Hustad (2004) states that an employee's thinking interacts with his or her workplace, while Stevenson (2003) posits that experts have the capacity to take meaning from one context and to apply it to another in order to solve problems that involve a high level of sense-making and application. Through the case studies, the experts showed how they drew from their domain-specific knowledge to use more abstract concepts to solve problems: their reasoning processes are more organised and they are able to articulate intuitive judgments in challenging situations. The literature on expertise has identified problem-solving as one such domain. Problem-solving involves the domain-specific knowledge of experts in their technical fields; their expertise and skills are then based on their personal values and beliefs. An expert learns to solve problems or answer questions related to a particular problem-solving domain or area of expertise and learns from his or her errors. Schmidt (2011) confirms that much problem-solving involves domain-specific knowledge, the accumulation of which is what makes an individual an expert.

7.4.1 Contextual Knowledge

Sackman's (1991) work contributes to the technical framework of organisational-cultural knowledge from a cognitive perspective, and describes such knowledge as 'organised knowledge'. This work does not, however, provide further insight into what is involved in this organisation. This section, thus, addresses the fundamental understanding that knowledge is constructed by and inseparable from the individual. The section suggests that organised knowledge is constructed in a system of activities and processes of knowledge embodying cognitive and structural knowledge within the organisational context. Cognitive and structural knowledge refers to accumulated knowledge, judgement, sense-making, and frames of reference, based on continued practice and learning. The sections that follow expand on this contextual knowledge by discussing the experiences, emotions, motivations, self-determination, and commitment that arose from the experts' case studies.

Sensed-Experiences: Emotions, Motivations, and Self-Determination

The experts who participated in this study had been involved in domain-specific and operationally rich contextual-dependent practice experience for 10 or more years. This experience embraces the 'experiential, social, cognitive, and performance-related' aspects of their practice (Hoffman, Shadbolt, Burton, & Klien, 1995, p.133).

As illustrated by the stories shared (Chapter 5), these experts hold experiential knowledge that is tacit, and the representation of experience can be abstract and encoded by language. For example, a shared cognitive tacit knowledge identified was the word 'fire-fighting'. This word not only had shared tacit meanings such as 'dealing with crisis', 'feel like a hero', or 'know what exactly to do' amongst the experts. The language used showed that this word also encompassed emotions. The emotions that they expressed were 'happy', 'felt great', and felt a sense of 'achievement'. Therefore, *knowledge capability* is mostly tacit in nature, and encompasses unique individual emotional experiences. Wolek (1999) asserts that workplace practices embody the elements of emotions and feeling. Adding to this, Downes (2000) suggests that through the expression of language, experiential knowledge represents mental thought processes, as it is both semiotic and cognitive. In this dissertation, the narratives displayed experiential knowledge: knowledge that was expressed through their language and emotions.

Whilst this dissertation does not focus specifically on emotions, the dissertation does acknowledge that emotions are an important component of the *knowledge capabilities* of an expert. Parrot and Harre (1996) theorise that positive emotions encourage an individual to continue with his or her practice. Negative emotions can (even if they interrupt actions) contribute by making the individual adaptable to achieving the ultimate goals. The way in which the experts adapt their practices by assimilating with the changing contextual rules is critical for organisational outcomes. Ultimately, an individual's positive and negative emotions influence their practices; moreover, if used appropriately in organisations, they can help understand tactical mistakes, errors in judgment, and bad behaviour. The emotions experienced in the experts' practice surface when they are successful at troubleshooting, when they set high demands, and when they successfully handle crises. Events that were emotionally charged were often evident in experts' stories. When experts were less successful in their practice endeavours, they often reflected on the event as a form of self-directed learning. Practice experience and the emotions that surround practice events are intertwined. Thus, an individual's practice experience forms a complex combination of knowledge, bounded by emotions and sense of commitment, within the context of the organisation.

Leading on from the discussion of language and emotions, and building on Vroom's (1964) theory of expectancy, Lawler and Porter (1968) suggest that the concepts of intrinsic and extrinsic motivation can help explain sensed-experiences.[19] Motivation is here viewed as another form of emotive feeling. Noting from Table 17 below, the expressions shared by each participant suggest that his or her knowledge was renewed by this intrinsic value of self-determined motivation. Van den Broeck and Cuyper (2014) argue that organisations that

[19] The researcher uses the term 'sensed-experiences' as a way of encompassing feelings and emotions that are part and parcel of practice and work.

support the individual personal values of employees may generate optimal employee performance. Extrinsic motivations are equally important, however, as the authors suggest, self-determination leads to intrinsic motivation and high commitment levels to the organisation.

Table 17: Example of Language and Interpretation of Emotions

Language in Narratives	**Interpretation of Emotions**
I do in my heart feel part of that area. So, I want to see it succeed (FP01, L422)	Attachment
… feel happier if an Engineer turns up with this B1 sized drawing … (FP01, L460)	Contentment
…workplace fatalities… and I had three of those in my life, which were pretty significant … I consoled myself (FP10, L205-216)	Empathy
…some of these stories really make me feel good, because I go past that I get part of their family … (FP18, L296)	Satisfaction, Connection
…it makes you feel nice and fuzzy …(FP26, L278)	Sense of Comfort
…while I'm getting stimulation out of it and it's fine and I'm enjoying it then I'm happy to contribute … (FP26, 91)	Enjoyment

Further to the examples in the table above, further perspectives provided by the experts highlight their deeper levels of intrinsic motivation through their self-determination to work on fixing issues that challenged the organisation. Their motivation was mostly steered towards learning. There was no hesitation to engage in learning to bring that advantage to the organisation. The experts' also provided insights their learning was motivated by either positive or negative emotions. These actions in some ways demonstrated commitment to their practice. As one expert shared: '… it's a very diverse plant so, from a technical side, lots of stuff to learn and act on' (INTFP01, L580–582). Another expert, Marcus, stated that

> the plant is shut down because they're waiting for me to fix it, so you had pressure, and the satisfaction of actually fixing it and getting them going was really good. I had a lot of personal satisfaction out of that (INTFP16, L581–584).

Based on these findings, it can be argued that learning in the organisation involves the construction and management of tension and motivation between the status quo and change. The findings showed that stress faced by the experts referred to challenging organisational norms and well-entrenched processes. The stress or tension is also caused by operational emergency. Cangelosi and Dill (1965) and Starbuck et al. (1978) suggest that a certain amount of stress is needed if learning is to take place. Through their stories, the experts highlighted that when stress was involved in extreme and stressful events (for example, the furnace breaking down and the primary supply of coal being disrupted), there was a deeper level of learning. The tension motivated them to learn. These situations charged the learner (in this instance, the expert) to reflect on how to carry out their outcome to meet the client's needs differently. These expert engineers, through their reflections shared how their self-directed practice-based experimental learning helped enhance performance and sustain organisational outcomes.

In drawing on these emotions and intrinsic feelings, the continued engaged performance of the experts leans towards commitment. As defined by Becker, Randal, and Riegel (1995), organisational commitment can be summarised as the desire of an employee to maintain employment with the organisation, with a continued willingness to align with that organisation's values and goals. Further support is provided by Northcraft and Neale (1996), who comment that commitment is attitudinal and reflects the ways in which the employee's expression of care affects the well-being of the organisation. More recent studies by Meyer, Becker, and Vandenberghe (2004), Meyer, Becker, and Van Dick (2006), Meyer and Maltin (2010), and Meyer, Stanley, and Parfyonova (2012) have integrated the theories of commitment and motivation to provide insights into what drives an individual to maintain organisational commitment. This is further evidenced by the observation made by Stanley, Vandenberghe, Vandenberg, & Bentein (2013) that the psychological perception of fairness demonstrated by organisations attracts intrinsic ties with individuals.

7.5 Presence of KM

The findings showed that there was clearly no KM system present in Gothamfield. Additionally, the major weakness identified by most of the experts is that their record-keeping needed improvement. A recent introduction by management to document every step of their practice was not seen as good value, according to the experts. The experts also stated that this infringed upon their practice and distracted them from doing their real job. Many organisations are gearing implement knowledge sharing and generation systems that have value adding processes such as contextualisation and sharing platforms (Pillania, 2006). Gothamfield, however, is still working on creating a database to store the reports and drawings. This has no other functions of capturing knowledge, apart from being able to retrieve the stored documents..

7.5.1 Organisational Learning

Organisational learning addresses managerial concerns and nurtures experimentations, social conversations and connections, and engagement (Chiva & Alegre, 2005). The KM literature shows that subjectivity also plays an important role in the learning process (Billett & Somerville, 2004; Fenwick, 2001, 2008; Kapuire et al., 2015). Moreover, Billett (2002) explains that learning is a conceptual process, which supports Goldstein and Ford's (2002) position that when a learner conceptualises, he or she becomes competent in operationalising the idea or concept in the course of his or her own practice.

Additionally, with practice, learning reaches another level, namely experiential learning, which has been studied from several perspectives. From the cognitive viewpoint, the accumulation of prior knowledge enhances the intellectual capacity of individuals to memorise new knowledge (Cohen & Levinthal, 1990). More specifically, learning and experience increase an individual's ability to interpret information and to select the information that can facilitate decision-making (Alavi & Leidner, 2001). Relevant prior knowledge also assists in internalising, processing, and reflecting to gain further learning to improve domain knowledge (Kwok & Gao, 2005). Indeed, studies in cognitive science have shown that individuals 'inherit their environment' (Odling-Smee, Laland & Feldman, 2003; Warneken & Tomasello, 2006, p.467).

7.5.2 KM Support System for Transfer

In the KM literature, the terms 'transfer' and 'transition' are used interchangeably and there is little discussion of knowledge transition. Knowledge transfer occurs when the recipient gains knowledge and understands the depth of experience represented by that knowledge. Conversely, knowledge transition refers to the ways in which the transferred knowledge is changed or altered.

To enable transition, understanding that knowledge is the outcome of a complex cognitive process involving individual perception, communication, and rationality in a domain-specific field is imperative. Relating to this transfer process, Bower (1987) suggests that individuals construct their own experiences and personal histories. In other words, as Hayes (1962) and Kolb (2014) suggest, learning is a process where there is an interaction between the world, the individual and these experiences (especially those gained during three focal stages between childhood and adulthood) that forms critical experiential schemas in an individual. The transfer and transition of knowledge from expert baby boomers to generation Y novices is complex, as each generation holds a different set of shared values, based on the significance of its group's generational experiences (Kupperschmidt, 2000). Boomers, for example, grew up with

conservative, traditional values, but they also identified with civil rights demonstrations. By contrast, generation Y novices are characterised as the opinionated children of a wired world (Rhodes, 1983) and are not shy about virtual intimacy. Trueman and Hartley (1996) note that 'mature students had better study habits than the younger students, in that they engaged in more 'deep' (and less 'surface') learning' (p. 201). These experiential schemas create different sets of values and work ethics, and may also cause shifts in workplace environments and corporate cultures (Judge & Bretz, 1992; Jurkiewicz, 2000), although the study results in this area are not conclusive.

Knowledge transfer and transition does occur in a space where Nonaka et al. (2000) define this space as 'Ba', described as a physical or virtual space that is interactive and encourages *shared cognition*.[20] This is a space in which the experts bring their personal sense of motivations and aspirations, subject to discipline consistent with organisational demands. This knowledge-creating space intersects with emotions and appropriates the transfer and transition of knowledge among individuals.

7.6 Loss of Knowledge and Consequences for the Organisation

Applying Senge's (1990) concept of systems thinking helps to illustrate the understanding of the perspectives shared by the experts on where and how they contributed in the organisation. As Senge (1990) asserts, systems thinking provides a way of understanding complexity within a given domain. Using a causal loop approach and drawing on the key findings, the elements that contributed to the fostering of the expert's expertise are illustrated in Figure 9. The conceptual profiling shows that key elements such as motivation; self-determination, communication, work ethics, internal drive, and learning were all positive enablers within the expert to help positively contribute to the organisation. The key weakness was their engagement with the database and the lack of a KM system in the organisation.

[20] The term 'shared cognition' is used by Nonaka et al. (2000) to suggest how individuals exchange and learn from each other's knowledge capabilities

Figure 9: Causal Thinking on the Knowledge Contribution and Potential Knowledge Loss of Experts

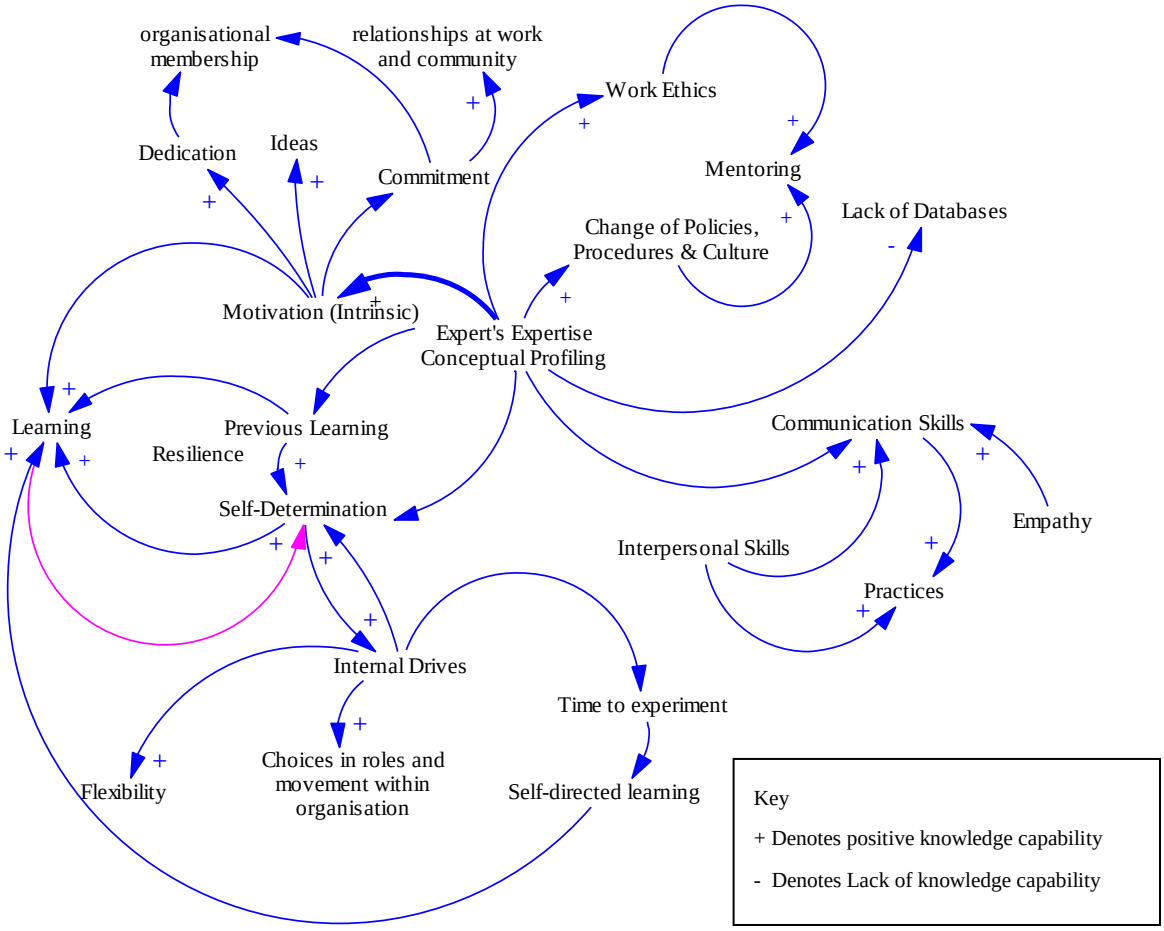
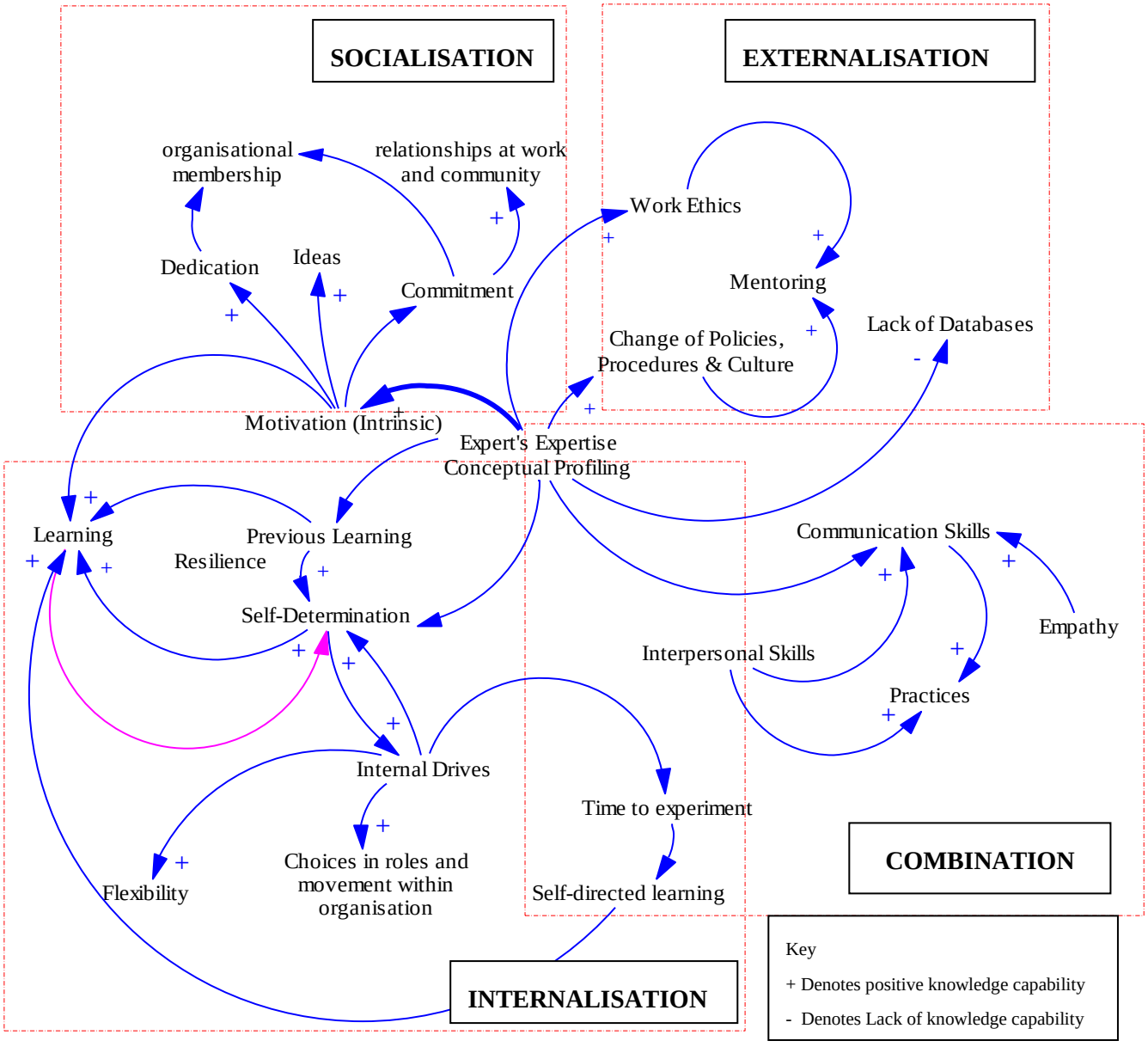


Figure 10 below is based on the SECI KM framework, and shows how expert knowledge contribution unfolds in each quadrant. In the **Socialisation quadrant**, the experts' motivation and organisational membership mostly drives their knowledge. In the **Externalisation quadrant**, the experts showed (through their shared narratives) that their knowledge is not captured in any database or organisational system, but that they have contributed through their work ethics and policies, as well as through the recent mentoring program for the cadets. In the **Combination quadrant**, the experts' main contribution is through their communication skills, which integrate their interpersonal relationships and empathy skills. Finally, the **Internalisation quadrant** explains how the experts' self-determination in learning has created resilience to the changes faced by the organisation as well as fostered their ability to continue to dominate.

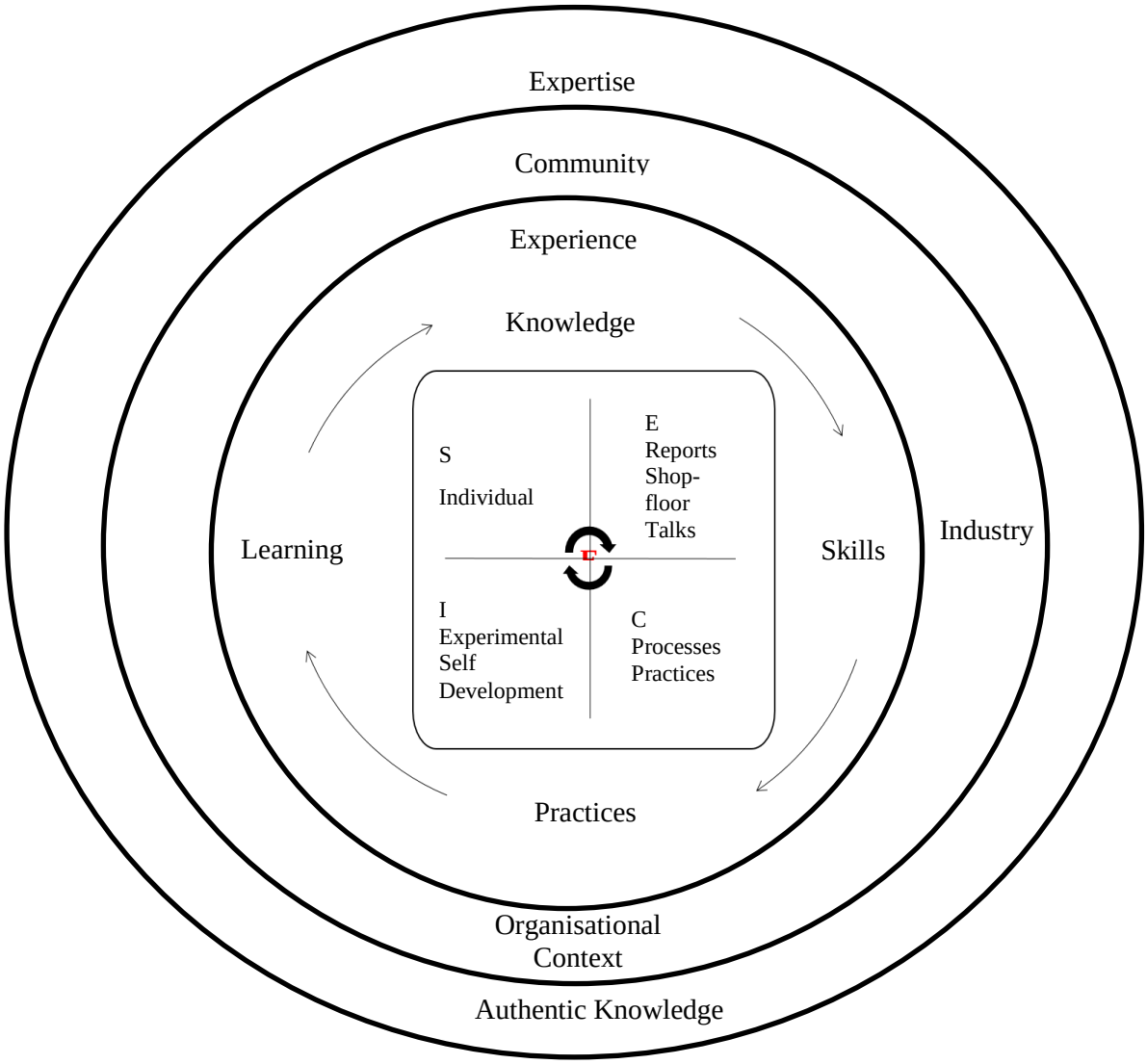
Figure 10: Causal Thinking on the Knowledge Contribution of Experts using the SECI KM Lens



Having applied the SECI KM framework to reveal how knowledge can be managed, Figure 11 illustrates how the experts' knowledge is layered, with each layer adding to the overall knowledge based on their *workworld*. The experts' knowledge of the community and of the organisation's commercial needs, through their presence in the international market, has evidently been an important precursor to their further learning and domain-specific knowledge. The heart of their knowledge was found in their engagement and emotional involvement in their own systematised form of KM. This knowledge (which comprises 'knowing why', 'knowing how', and 'knowing when') is an intuitive presence in the SECI model. Furthermore, Figure 11 captures the essence of the layers that demonstrate how an expert's knowledge contributes as

well as identifies knowledge loss and its impact on the organisation. This illustrates the key element of emotions (labelled 'E' for experts). The presented findings demonstrate that emotions are drivers of motivation and self-development learning as well as a key factor in expert knowledge. This dissertation contributes to the SECI KM framework, in that the space of 'Ba' is contextualised with feelings and emotions that correspond with each quadrant.

Figure 11: Complex Layers of an Expert's Knowledge Contribution and Impact on the Organisation



7.7 Chapter Summary

Against the backdrop of the challenges posed by an ageing workforce, this dissertation has explored knowledge contribution and loss from the perspective of experts in an organisation. The discussion has been organised around the three key concepts: expert knowledge, the knowledge contributions, and the presence of KM and support. The discussion above confirms the areas where knowledge loss can occur when an expert departs the organisation. Using an inductive approach, the themes that arose showed that *knowledge capabilities* are unique. Moreover, knowledge is continuously shaped and refined in the expert's *workworld* whereas the contextual knowledge contribution is valuable through their activities and process in their practice.

CHAPTER 8 – RECOMMENDATIONS, CONCLUSION, AND DIRECTIONS FOR FUTURE RESEARCH

8.1 Introduction

This concluding chapter provides recommendations that are based on the dissertation's findings. The research implications for KM in organisations and methods to ensure knowledge retention are presented, and the chapter concludes with directions for future research.

The purpose of this dissertation has been to understand experts' perspectives on the consequences of knowledge loss that could arise following their departure from an organisation. The research findings revealed complex layers of knowledge contributed by individuals, which were examined through the perspectives of the experts' *workworld*. The experts not only transacted their *knowledge capabilities* through their assigned roles and work practices, but also shared their experience through mentoring and as exemplars. These individuals were highly experienced, long-serving specialists, having worked for the same organisation, Gothamfield, for at least 10 years, and in some cases, more than 20 years. These experts specialised in engineering in the mining industry. This dissertation has addressed the practical concerns associated with the loss of expert knowledge, a facet that is central to organisational performance and success.

The sections below provide a backdrop for the practical and theoretical implications followed by the recommendations. The recommendations are focused on the ways to reduce the risks associated with knowledge loss and, at the same time, ways to enrich the experts' *workworld* with positive management strategies. The recommendations are beneficial at both the individual and organisational level. At the individual level, the recommendations highlight the need for employees to reflect on their role and capabilities within the *workworld*. At the organisational level, the recommendations provide organisations with strategies, KM frameworks, and techniques to capture, transfer, and cultivate a learning culture.

8.2 Practical Implications

With younger workers seeking employment in the growing service sector, mature manufacturing organisations may experience difficulty finding individuals with the knowledge, skills, and experience necessary to fill industry roles. Furthermore, as Australia's workforce ages, many industries can expect more of their experts to retire (Skills Australia, 2010; Kulik,

Ryan, Harper, & George, 2014). A significant amount of pressure will be placed on manufacturing companies to retain expert knowledge.

Australia's manufacturing sector is in a renewal phase, especially with respect to the ways that it benefits from global knowledge (Green, 2015a). Manufacturing will possibly continue to play a pivotal economic role in Australia, as Australia is poised to become a knowledge-based economy. The findings show that Gothamfield has a system used by the experts to record their work. However this system the experts identified was non-integrated with the other divisions and mainly used for recording purposes on shop-floor activities. Given the industry's desire to be part of the knowledge-based economy, the organisation needs (at the very least) a KM system. The lack of a KM system (especially when specialist knowledge is at the core of operations) could place the organisation at a significant competitive disadvantage. The findings suggest ways to capture and retain knowledge for learning and improvisation that will be a primary capability in the future of manufacturing for Gothamfield: specifically, a system that can capture unstructured shop floor stories.

The recommendations provided in this chapter will hopefully assist Gothamfield as well as other organisations facing similar workforce issues; and provide guidance on knowledge transfer and learning. Organisations that face unique circumstances, such as those with a community similar to District 1 that is heavily reliant on local resources, can develop strategies to support employment and the community.

8.3 Theoretical Implications

Expert testimony provided in this study suggests that experts were well aware of the potential for the loss of their knowledge contribution and contextual organisational learning upon their departure from the organisation. The experts' insights on how their practice knowledge, as well as their reflections, were critical in directing their learning draws on emotions and motivation that play a role in knowledge transfer, sharing, learning, and self-determination in the *workworld*.

Based on the findings using the principles of the SECI KM model (Nonaka and Takeuchi, 1995), the key theoretical implications incorporate both individual and organisational level contributions to the harnessing and transfer of knowledge for learning. Furthermore, the synthesis of tacit and explicit knowledge creates space for the connectedness and interactiveness described as 'Ba' (Takeuchi & Nonaka, 2004). The contribution of this dissertation draws a relational understanding of knowledge transfer and that the space 'Ba' is where management can focus on emotional management efforts and motivationally driven tasks and support self-

determination at work. For example, through the stories shared, it was evident that the experts' practices and actions were continuously recreating their social and practice environment through their interaction and learning to perform for enhanced organisational outcomes. The environment too has an influential role in which it assists in synthesising to create knowledge (Takeuchi and Nonaka, 2004).

The contribution this dissertation makes is that the *knowledge capabilities* of experts are groomed in the context of the organisation which forms the expert's *workworld*. This interaction between expert and organisation occurs in each quadrant (*knowledge space*) where the experts' motivation is to perform better in their practice through learning. This study's findings lead to the understanding that self-directed learning in organisations is a deliberate intellectual activity practiced by experts; and that practice knowledge and felt-emotions played a role in their peak performance. All of the above have contributed to the knowledge held by the experts.

Creating interconnectedness between knowledge and the emotions of motivation can enhance efficiency; maintain a system of shared meanings that contains memories, values, and beliefs; and, at the same time, harness creativity (Ashforth & Humphrey, 1995; Smith & Lewis, 2011). The opportunity for creativity arises when the learner understands the emotional tensions and the experiential contradictions in the workplace, which they can rationalise and use to adopt paradoxical thinking (Smith & Lewis, 2011). Thus, it is vital to recognise that in knowledge transfer and learning practice, knowledge has both cognitive and emotional dimensions. Therefore, the researcher using the SECI-KM framework can help to identify where emotions and motivations affect the transfer of knowledge mainly for learning purposes, which will aid in the knowledge transfer process. The SECI KM framework can serve as a structure for the organisation to observe, capture, and interpret emotions, as expressed through language, that are essential for experience transfer and the identification of motivational energies. Through the shared stories, language or vocabulary that represents the individual's particular and presentational emotions (Hochschild, 1979 and 1983; Bolton, 2005) can be captured for transition. Using the SECI KM framework, the *sensed-experiences* can be captured in each *knowledge space* and harnessed as a valuable intangible resource for organisational wellbeing and competitiveness. As Bolton (2005) suggests, managing emotions is an influential powerful agenda for organisations to pursue as 'the organisational actor is an active knowledgeable agent' (p.3).

Building practice know-how in context involves a continual interaction between the individual and the work environment that is constantly negotiated by their learning. Therefore, this practice (know-how) experience is not just a cognitive process and accumulation, but one that is subjected to the various feelings experienced during learning, and resides at both subjective and

objective levels within the expert. In describing the relationship between the epistemic and emotional dimensions of knowing and doing, Polanyi (1958) writes: 'The tracing of personal knowledge to its roots in the subsidiary awareness of our body as merged in our focal awareness of external objects, reveals not only the logical structure of personal knowledge but also its dynamic sources' (p. 60). These dynamic sources of emotions reflect the experts' relationship and connectedness to the work environment through their social interactions and practice. Examining the experts' practice shows how their practice knowledge is entrenched with emotions and reflective learning that situates the individual on scales of mastery or expertise. Understanding these emotional exchanges can aid in improving individual motivation and performance within organisations and the employees' *workworld*.

Motivation is not just a psychological interaction between the individual and the environment. The studies lead to the understanding that the engineers were keen to direct their energies to learning through which the engineers showed their connection with their *workworld*. Expert testimony presented in the current study indicates that experts showed considerable self-awareness, tacit knowledge, and enthusiasm with respect to sharing their knowledge in areas where they were comfortable. The experts also demonstrated a strong resolve to continue learning through self-development in areas that were critical to the organisation's performance needs. This resolve was often expressed in emotional terms.

This dissertation has aimed to identify perspectives of knowledge loss, and (in doing so) has demonstrated that there is a strong link between experience, knowledge, skills, and learning in an organisation. The dissertation also demonstrates that emotions and language play an important role in organisational cultural sense-making and KM (Schall, 1983; Schien, 1992; Cremer, 1993; Weber and Camerer, 2003). This dissertation has only touched on the role of culture and language in organisational sense-making and KM. This is an area where additional research could be useful.

8.4 Strategic Recommendations

Based on the findings reported in the thematic analysis, the researcher considered current workplace KM initiatives. In doing so, workplace technological evolution and the connectedness between employees were key considerations.

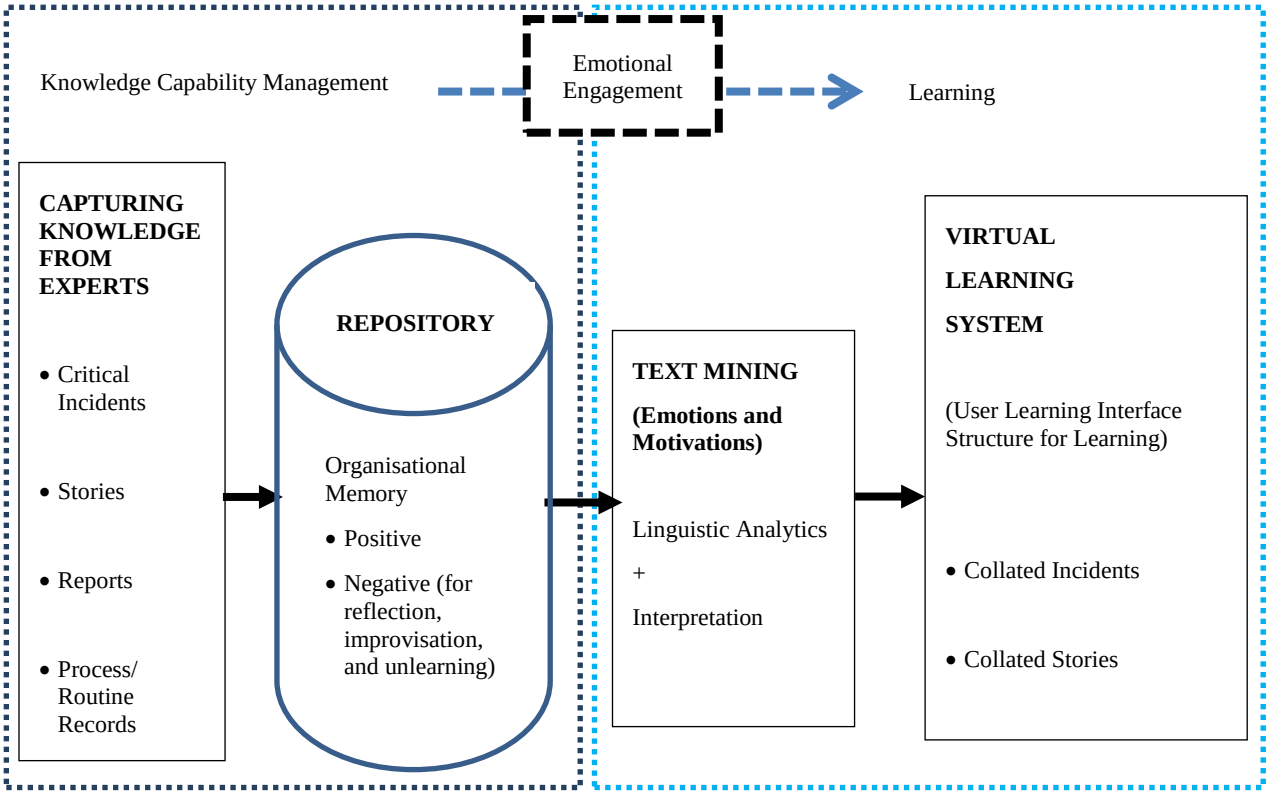
This dissertation's findings recommend two key constructs that particularise KM within the *workworld* context —*practice-knowledge* (tasks and activities) and *sensed experiences* (feelings and emotions experienced in work practice). Practice represents the connection of 'knowing' and 'doing' (Gherardi & Strati, 2012, p. 10). Practice knowledge is often dynamic; that is,

change is often a constant feature spurred by organisational efforts to ensure operational efficiency, the need for improvisation, or with customer-tailored requirements that have been influenced by external changes. During practice, the flow of intrinsic joy or unhappiness through self-actualisation and self-direction entails peak performance behaviour. The behaviour mentioned, scholars contend leads to optimisation through reflection and practice learning (Privette, 1983; Bakker, Demerouti, & Lieke, 2012). This expression of emotional feelings involves an important connective relationship between knowing and doing. Figure 12 below illustrates emotions as an emergent factor. The importance of capturing the emotions within the expert stories for knowledge transfer of practice knowing can engage with individuals on a more social level. The emotions and motivations in carrying out the practical tasks through an individual's knowledge capability and talent can link the cognitive and behavioural aspects.

8.4.1 Recommendation 1: Conceptualised High-Level Framework for an Automated Learning System

This dissertation recommends that organisations consider designing and implementing a learning portal, known as an Automated Learning System (ALS). The aim of this learning portal is to capture stories, critical incidents, reports, and processes to form a coherent understanding of a situation in context to assist in learning and unlearning. These captured narratives will not only form part of an organisational memory repository, but will also be a platform for learning. Learning platforms already exist in organisations, however the findings from this dissertation suggest that the inclusion of an emotional connection to the practice knowledge can connect with the learner in ways that enable a deeper understanding of how and why things were done. The cadets interviewed demonstrated their engagement with the experts were both at social and cognitive level. There are two major design features in an ALS (see Figure 12).

Figure 12: Conceptualisation of High-level Framework for an ALS



The first step is to build a Knowledge Capability Management System that facilitates capturing narratives; critical incidents, stories, reports, routines and processes. This is an important organisational memory repository. The second design component is labelled 'Learning', and is designed to facilitate knowledge transition. The key integrator within this KM system is the language and emotions to connect with the learner at a social level. Using features such as text-mining of language, the system identifies the emotions associated with both successful and failed practices. Text mining can also be described as knowledge discovery. As Tan (1999) confirms, text mining can transform unstructured text documents, distil the knowledge, through searching, filtering, retrieving and reducing from patterns in the immediate form. This is followed by clustering, classifying, summarising and organising the unstructured data into relevant domains of knowledge to derive organisation-related knowledge for reuse.

Rajman and Besançon (1998) and Said, Eldesoky and Arafat (2015) state that the transformation of unstructured data to structured using natural language processing (NLP) can extract a fuller meaning of the text. Having text mining and NLP tools in a KM system helps create contextual understanding on what, how and why some practices were undertaken and what and how and why some practices should not be undertaken. The recommendation is to develop text mining that specifically focuses on language and the interpretation of the positive and negative emotions and motivations experienced by the experts. Text mining of the language

can be extracted from stories shared, sharepoint blogs, and even report decisions. The ultimate challenge will be to enable this capture and facilitation for knowledge transfer. The outputs for learning can assume a form that suits the novice based on their learning style. Structuring a learning output for knowledge transfer through 'Virtual Learning System' can take the form of collated incidents, stories and creating simulations.

DeLong (2004) has written extensively about the usefulness of learning systems in terms of organisational retraining, managerial training, and bridging jobs. Given the ageing workforce is currently being replaced by an entirely new generation with different social attitudes and learning capacities, this conceptualised ALS will enhance learning through a contextual sense-making process.

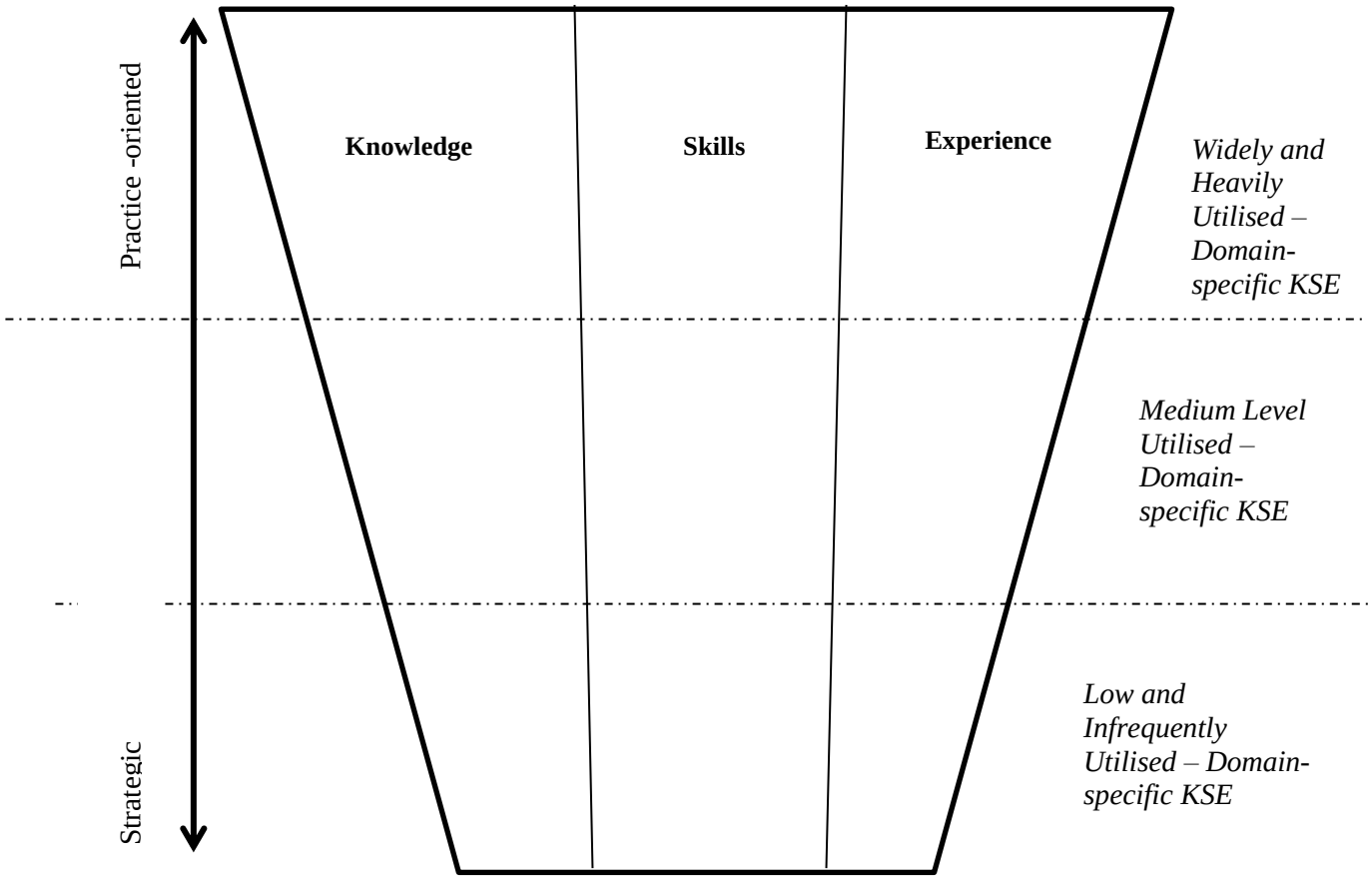
Conceptualising through literature, an effective ALS should develop 'parallel thinking' (Sternberg & Davidson, 1995); learning that connects the expert with the novice. This meaningful learning connection allows the novice to recognise the experts' domain knowledge base and understand their intuitive and analytical decision-making skills (Prietula & Simon, 1989; Stolper et al., 2011), often through pattern recognition (Klein & Hoffman, 1993). The ALS associated with problem-solving, trouble-shooting and aligning with the expert's cognition allows organisational learning. This system captures trouble-shooting techniques, decisions that also address managerial progressive directions of the organisation. Literature in the KM discipline shows that subjectivity plays an important role in the learning process (Fenwick, 2001 and 2008; Billett & Somerville, 2004; Chiva & Alegre, 2005; Kapuire, Winschiers-Theophilus, & Blake, 2015). Thus, this connective parallel thinking can benefit a transitional workforce. Furthermore, Ungaretti and Tillberg-Webb (2011) state that developing learning systems and process that consists of these insights with action outcomes need to be within context of the organisation and the work practices. Organisations faced with an experienced ageing workforce can benefit from a system such as ALS, which has the capacity to capture critical knowledge.

8.4.2 Recommendation 2: Knowledge Skills and Experience Inventory Bin

Given the changing role of HR in organisations where the focus is on developing intellectual capital (IC) and at the same time maintaining competency activities, Kolachi and Akan (2012) argue that HR needs to formulate strategies to better manage IC. Together with facing the challenges of the experienced ageing workforce, this dissertation recommends the design and implementation of a knowledge skills and capability tool known as the '*Inventory Bin'*. The inventory bin illustrated in Figure 13 below is designed to be a portfolio system that records the experts' knowledge, skills, and experiences aligned with their current operational roles, responsibilities, and functions. Once again, given the changing face of HR, Johnson and

Gueutal (2011) argue that the way forward for HR in organisations is to not only embrace e-HR, but to review their service and partnerships for more real-time metrics. Furthermore, given the autonomy of roles created in organisations, HR partnering with the employee in their work and career journey in the organisation is critical (Mansour, Heath, & Brannan, 2015). Therefore, this Inventory Bin is especially critical for Gothamfield and other organisations in the similar situation of having lost track of an employee's roles and responsibilities and being faced with high attrition rates. This application and tool can be one that is managed by HR, and can involve HR assisting the employee in maintaining the currency of their experience and knowledge through a self-input system where the individual can update their profile on a regular basis. This provides the employee with a sense of ownership that comes with updating their profile; and it allows the employee to maintain a comprehensive report of their positions, roles and responsibilities. From the HR point of view, HR will be able to stay up to date with the employee records as the inventory bin allows the years of experience in given knowledge and skills areas to be highly visible. More importantly, in capturing experience and growth in a particular domain, the KSE inventory system can enable HR to manage the organisation's IC resources effectively. Again, managing IC effectively can allow an organisation to understand employer-employee commitment (Kolachi & Akan 2012). Accordingly, the system allows management to identify specific workforce talents and to evaluate the organisation's capability level. Together with HR, the employee can identify which KSEs are heavily or medium or lowly utilised.

Figure 13: Knowledge, Skills, and Experience Inventory Bin



Provided that the inventory bin is updated on a regular basis, the system has the following benefits:

1. Transfer of knowledge to new members in a group on the KSE present in the organisation and within the team.
2. Identifying any gaps to ensure the recruitment of the appropriate talent to provide the right mix.
3. The development of self-motivation pathways, because individuals can see their learning growth and career path. This encourages a sense of ownership.
4. The creation of a disposal system where disposed KSEs are captured and reflect how organisational talents are matched with strategic directions.
5. The creation of a KSE corporate memory.
6. The creation of an expertise database that simplifies the selection of project members.

8.4.3 Recommendation 3: Work Practices for Knowledge Co-Creation

This study recommends that the organisation develop a range of work practices to facilitate knowledge co-creation. A range of work practices focused on intergenerational learning can be identified. For example, Joshi et al. (2010) suggest that retired experts desirous of returning to work, be given a role within the organisational learning strategy. Scholars such as Bengston (1975), Wade-Benzoni (2002), Bengston, Elder and Putney (2005), and Wade-Benzoni, Hernandez, Medvec, and Messick (2008) argue that interdependency created through learning between generations can provide a vital foundation for the transfer and sharing of knowledge, skills, and other organisational resources. These expert roles could include: (a) job sharing; (b) structured mentoring; (c) remote-aid. Delong (2004) recommends 'flexible phased retirement', which allows near-retirement experts to create a workplace where they can exercise a choice of temporary, casual, seasonal, and part-time job-sharing (Hedge, Borman, & Lammlein, 2006) facilitated by remote-aid; and (d) 'at-demand' (required for specific practices, and the period of engagement can vary depending on the knowledge transfer required) employment contracts. This managerial strategy is designed to fundamentally manage knowledge and create organisational learning. Mentoring programs and learning programs can help employees to excel in their work (Khosrovani & Ward, 2011).

8.4.4 Recommendation 4: Gamification

This study recommends that gamification be implemented to facilitate intergenerational learning and learning connections between experts and the younger generations of workers. Gamification can be described as the application of game mechanics that engage and motivate individuals through achievement, and which are technological alternatives to real games (Bogost, 2011). Thus, gamification can teach knowledge and skills through game-like simulations and animations of crisis situations.

Expert testimonies provided in this study indicate that the experts typically engage in self-learning, experimentation and prototyping to solve issues in shared control rooms or back-workshops. Thus, the workers are predisposed to traditional game room-type activities. Gamification is particularly relevant for the younger generation who are comfortable with technology and enjoy working with virtual reality (Song & Keller, 2001; Dede & Ketelhult, 2003). Gamification is expected to facilitate the retention of corporate memory, as well as the transfer of learning.

8.5 Conclusion

The present study has answered the main research question*: How do Gothamfield's expert employees perceive their knowledge contribution to this organisation, and how (following their departure) will the loss of this knowledge affect the organisation?* The expert perspectives contribute to theoretical and empirical research. The research findings highlight the need for further research, particularly studies that link the theoretical research to developing areas where KM for learning and the implications for organisational performance are concerns.

The results of the analysis have revealed thematic categories that emerged from the responses of the 30 participants. The responses demonstrate expert knowledge contribution and the potential loss of knowledge to the organisation. The main contributions of this dissertation are the insights provided by the case studies, and the conceptualisation of knowledge contribution and loss through the lens of the SECI-KM framework. The dissertation also shows that feelings derived from experience should be integrated within the collaborative space. The conceptualisation identified that the expert's knowledge is a fusion of layers of knowing that builds the experiential level of the expert's knowledge. Each layer—and specifically the outer layer of community, industry knowledge, and the inner layer of contextual and situation knowledge— becomes permeable and variable with the responsibilities and practice outputs in the expert's *workworld*. At the heart of this conceptualisation is the individual's sensed experiences in the *workworld* that must be captured by the SECI-KM framework. This becomes a critical component of the organisational memory and a creative process in parallel learning so that the novice can build personal talent through subjective judgement. This conceptualisation and discussion have been drawn holistically utilising the SECI-KM framework to identify the knowledge of the expert. This thesis recognises the expert's knowledge contribution and underpins the type of knowledge contributed, potentially lost, and how that knowledge can be managed.

The recommendations based on the findings and conceptualisations provide the organisational strategies and frameworks to address *knowledge capabilities* and understand the knowledge loss from the departure of experts and all types of employees. At an individual level, the recommendations provide the expert and the individual with the ability to assume responsibility and ownership of knowledge capture, transfer, and learning to understand and value their contributions to the organisation. The recommendations provide the team with a common understanding of the *knowledge, skills, and expertise* and the thread of emotional connectivity required in their *workworld*.

8.6 Future Research

Against the backdrop of challenging ageing workforce issues, this dissertation has addressed the complex area of expert knowledge loss from the perspective of the experts themselves. It is evident that the dissertation has made a significant contribution by conceptualising knowledge loss using the SECI KM framework. The dissertation presented the three key areas of: authentic expert knowledge, the contribution of knowledge in an organisation, and the presence of knowledge management and support. From this conceptualisation, further research has been identified, which is discussed below.

Organisational Front: In 2010, Gothamfield authorised this study to understand what knowledge may be lost and how knowledge can be captured. The organisation was aware that a large proportion of the expert workforce was retiring. The organisation also faced a unique set of circumstances with respect to recruitment and retention because of its location and community-culture fit. All of the above recommendations can assist Gothamfield in a practical way to address knowledge loss. A question has arisen from the findings, however, and that is why the experts continued to work and learn for the benefit of the organisation, even though they felt that they were not valued? This question could be investigated in future research.

Industry Front: Australia's manufacturing industry is gradually relocating offshore, and it is likely that China will emerge as a manufacturing giant. Becoming a successful global business involves a transition process. Transition is highly dependent on cultural sense-making (because individual mental models differ with respect to cognitive, social, and behavioural phenomena in different cultures). There is definitely scope for further research in this area. A specific, possible question to be pursued in future research is: 'Does cultural intelligence play a key role in understanding knowledge transfer and learning?' Finally, as identified in the findings, organisational culture and context plays critical roles in shaping the *knowledge capabilities* of employees.

KM Technological Front: Based on the findings and the recommendations, in relation to KM and KM systems, managing 'big data' and artificial intelligence will play important roles as organisations start focusing to capture *knowledge capabilities* for knowledge transition. Further research, perhaps building on cognitive and neuroscience developments, could assist in providing knowledge transfer and learning tools, particularly with respect to interactive technology tools such as gamification simulations.

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APPENDIX 1 – RESEARCHER'S REFLECTION

As defined from a social research perspective, 'reflexivity' refers to a technique of self-referencing that is used to examine and explain occurrences (Cassell & Symon, 2004). To achieve reflexivity, the specific action of reflecting over the research process at every stage of the study was required. Hence, reflection was a central part of the reflexive learning endeavour.

Reflexivity teaches individuals to learn reflection of 'behaviour and thoughts, as well as on the phenomenon under study' (Watt, 2007, p. 82). Woolgar (1988), Hardy et al. (2001), and Cassell and Symon (2004) contend that reflexivity helps a researcher understand and refine the process, and shapes the study's outcomes. For example, by incorporating my own knowledge with the insights through reading and site observations, I was able to interact with thoughtful considerations to the asymmetrical relationship between myself and the interviewee, but at the same time not allowing any judgemental thoughts to intervene in the analysis. Collins and Cooper (2014) posit that qualitative research requires emotional maturity and the emotions associated in fieldwork and then understanding how the emotions gained during this process leads to further insight. The insight I gained was learning to self-regulate the participants' impulses and emotions that addressed the self-control and trustworthiness in the data collected from the participants. I believe that, as a researcher, my insights helped shape the research. This reflexivity allows my research skills to be refined and to build a research project wrapped in understanding of the context.

My role as a researcher in this dissertation is one of a PhD student with a curiosity as to how people value themselves in their roles and functions in relation to their knowledge contribution in an organisation. In particular, my interest in the loss of important organisational knowledge from organisations with the departures of senior and experienced members motivated me to conduct this research. This curiosity resulted in the birth of the research question. Apart from being curious as an early researcher, John Dewey (1920 and 2004) stated that reflective thoughts that promoted scepticism encourage the mind to search for evidence for reasoning.

The first reflective thoughts that occurred were how to present a research question that was searching for answers from experienced individual's perspectives be framed and sequentialized in the study. This initial reflection was linked to the difficulty in accessing an organisation to conduct the study. I approached several organisations that refused to grant me access. Thus arose the question: Why were organisations reluctant to participate in a project that would be beneficial to their organisations? This reflective question made me appreciate that the issue of

trust was a big one for organisations to handle and not face further risks on losing staff. Perhaps national and organisational culture had a role to play. Dale (2007) argues that Australian culture has ‘a laid-back approach to work and relationships, signifying calm optimism or complacent fatalism’ (p. 41). Given the statistics of the ageing workforce and other economic influences impacting organisational sustainability, I had an even stronger conviction that my research question was important to all businesses,

Most importantly, this reflection made me think about how I ought to deal with these sensitivities in order to encourage organisations to participate in my study. This was particularly important given that organisations did not completely understand the demographic challenges and the shift in generational workplace values and learning. I decided to adopt another strategy. This strategy involved conducting presentations for a number of organisations on the workforce issues faced in many countries, including Australia. With this approach, I was hoping would make the organisation aware of their own situations and trigger an interest in participating in my research. Another understanding this reflection brought was that I needed a contact within the organisation, even as a gatekeeper to act as a conduit of trust between the participants and me as the researcher. The reflection, of initial scepticism, followed by reasoning and re-approach led to solutions. I gained entry into an organisation in the industry I believed this research would benefit.

Eventually, Gothamfield, a mining-manufacturing organisation, agreed to participate. Their acceptance to participate was extremely positive, especially when both the mining industry and (more broadly) the manufacturing sector were facing intense challenges and changes as a major gross profit player in the Australian economy. I was initially disappointed that I could not get other similar organisations to participate in order to do a comparison. On reflection, a single organisation provided me the opportunity to create a credible study for a variety of reasons: (a) the study organisation is representative of many similar organisations in the industry vital to the Australian economy; (b) this organisation had experienced knowledge loss through various pathways of departures, which could not be curtailed despite numerous attempts by the HR division; (c) the Australian government has a keen interest in such an organisation to maintain future research and funding in South Australia so as to continue to deliver skills to this industry; (d) the gatekeeper of this organisation was a champion of the research, supporting the process by granting access and making calls for participation; and (e) it was a feasible project for a PhD study.

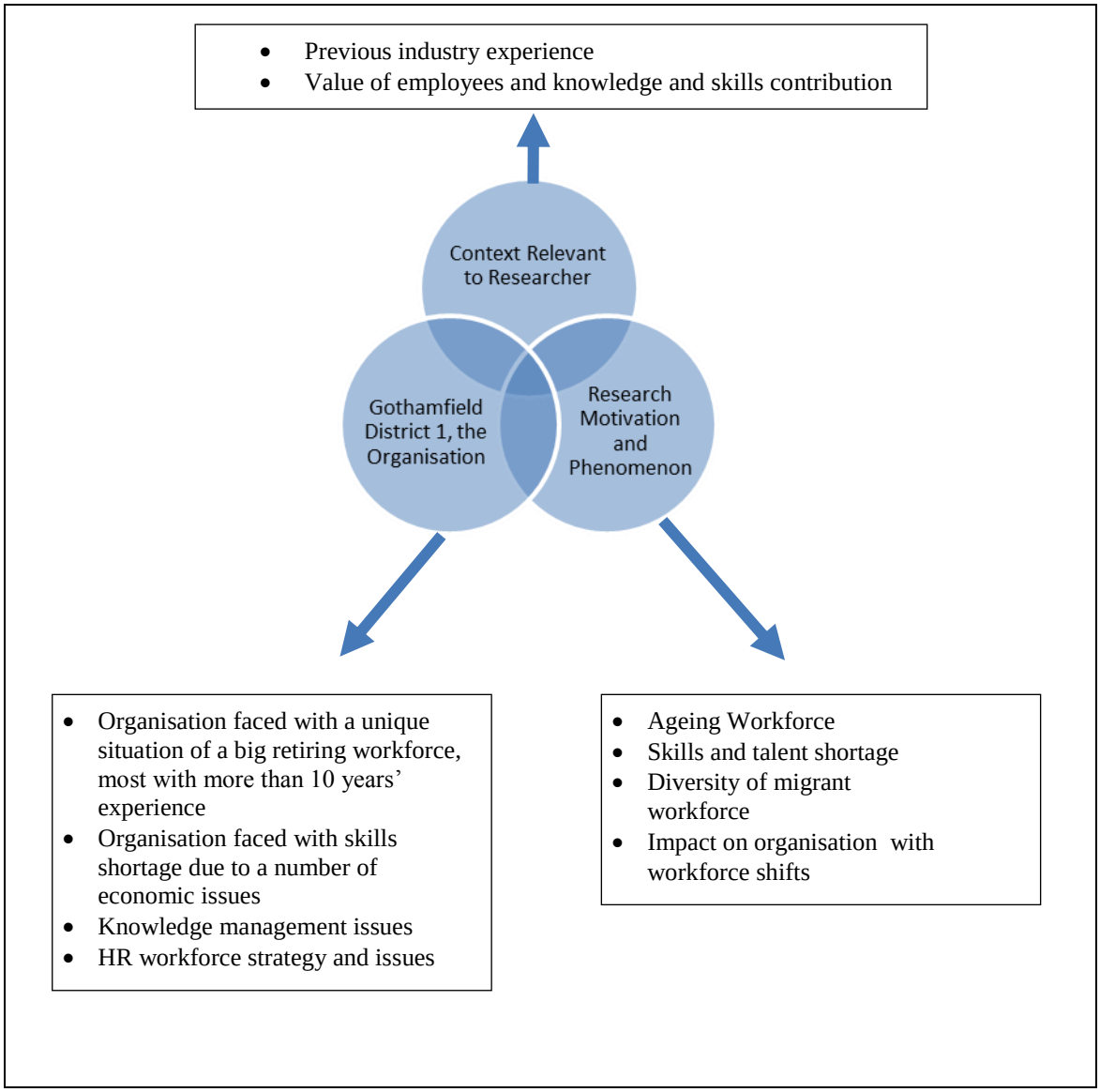
While this dissertation was motivated by my personal and academic interest, it was important to consider my role from a novice researcher’s perspective. I applied Morse’s (1995) theory, which outlines essential stages for a researcher to consider and reflect on when embarking on any

dissertation. These stages appear linear, but they are recursive, illustrate progressions in this dissertation, and describe the researcher's roles. Morse (1995) described these stages as follows:

a) Conceptualising research questions
b) Discovering, consolidating and advocating during the research journey
c) Managing evidence, information and knowledge
d) Finalisation

During this discovery process, it became clearer through my reflection that it was important in the dissertation to be clear on the contexts of research. Adapting Kayrooz and Trevitt's (2005) crucial aspects of context, I have provided a brief illustration as shown in Figure 3 on how context is relevant to the (a) the researcher, (b) the research organisation, and (c) the research motivation.

Research Rationale and Context



Source; Adapted from Kayrooz & Trevitt (2005)

During this study period, I learnt that the researcher and the research world are both contained in an experience that cannot be separated. The researcher, however, must ensure that the narratives of the real world that they seek to understand are not tainted by their own experiences. Throughout this process, I ensured that reflection was undertaken at each stage. An important question to ask at every stage was 'Am I making my personal viewpoints?', 'Have I clearly expressed the participant's voice?', and 'Have I contradicted anything and created noise?' This was an important process of self-discovery (Simon, 2006), especially for an early career researcher, as it aided in questioning processes applied to the research study. This process also makes the researcher aware of his or her own subjectivity.

To maintain rigour and to minimise any bias on my part, the researcher adopted a method that erased 'perspectival subjectivity' (Kvale, 1996, p. 212). First, while listening to a participant, I noted the perspectives expressed whenever a viewpoint arose. I then posed further questions on the same subject to obtain multiple perspectives from the participant. This ensured that my interpretations were close to the voice of the participant.

Elaborating further, an important role for the researcher is to ensure that findings of the dissertation are (as much as possible) free from his or her biases. Researchers have experiences that guide their actions and perceptions. The biases of the researcher that stem from experiences in a particular organisation can influence the participants during the process of data collection. The active recognition of my personal views and opinions was a beneficial strategy that helped to categorise facts that were consistent with the experiences of the participants. For example, during my site observation, the guide advised me of the dangers of the blast furnace and associated accidents. My observation of engineers on site working at the blast furnace and the kinds of precautions they took added to my understanding and insight. This made me appreciate the safety standards required at this work site, and how the participants conducted themselves in practice. Therefore, when questioning their safety knowledge and standards culture, my observation helped me recognize and categorize what was deemed 'dangerous' when the participants shared their stories.

Keeping these issues in mind, during the interviews I tried to be as detached and neutral as possible. This neutrality resulted in a flow of information. My role in the process was to facilitate this flow of thoughts from the participants and to seek clarifications whenever required.

During the interviews, another of my roles was to ensure that the participants felt comfortable and had control of the information that they provided. This was an essential step, especially in long, in-depth interviews when some participants are easily 'carried away' with their conversations and revealed sensitive information. For example, one participant asked me: 'That's okay to say?' Simons (2009) stated that giving participants the opportunity to edit their comments was actually giving them 'the power of the social dynamic of the in-depth interview' (p. 105). Providing the participants with the opportunity to edit their remarks not only means that they are they in control of the way they are represented, but also that the researcher has corroborated with them. I could engage the participants very quickly in the research setting by asking icebreaking questions that were part of their organisational experience. Questions and statements that helped included 'How many breakdowns did the furnace blaster face this morning?' or 'This weather is going to make it hard to get to the tunnels.'Active listening was also important in grasping the participants' hidden meanings and emotions. I learnt to accept the

silences during the interview without trying to frame the participant's choice of words or complete the sentences. This helped ensure that none of my biases and experiences tainted the data.

As Simons and Usher (2000) argued, reflectivity is vital for a researcher. The researcher must re-examine the values in the 'interactive partnership' conversation with the participants and the context. I recall one occasion when an interview conversation moved beyond the interest of the study when a participant began talking about gender inequality. This was a dilemma, because I had to maintain an active listening role, while shielding the particular participant from self-incrimination. My response was to stop the recording and allow the participant to share her views. Taking this opportunity, I briefed her that she needed to address this matter with her HR department. I added that if she was willing to continue with the interview, we could explore the set of questions in relation to my research. This break also gave her time to compose herself while she decided to continue with the interview. I believe that this act gave the interviewee a sense of integrity, and maintained a coherent and a stable set of values and principles.

In this study, qualitative research performed in an organisational setting was intended to contribute knowledge in the academic world and at the same time provide recommendations for managing knowledge to the organisation. Even though the objective of the research was to provide positive outcomes, it was critical that I ensured minimal harm to the participants from the research process and findings. The ethical considerations included informed consent, confidentiality, privacy, data security, and the anonymity of the organisation and persons interviewed. Pseudonyms were used and care was taken to protect individual sources and sensitive information shared by the participants.

My reflections in summary can be described as reflection-in-action, where Arendt (1971) writes that

> Every reflection that does not serve knowledge and is not guided by practical needs and aims is … 'out of order' … it interrupts any doing, any ordinary activities, no matter what they happen to be. All thinking demands a stop-and think… (p. 78).

Research needs to have both theoretical and practical outcomes. As a learner researcher, I believe this is a critical journey.

APPENDIX 2 – ETHICS CLEARANCE

To: Prof Pamela Green/Miss Selvi Kannan

[BC: Miss Selvi Kannan]

Dear Prof Green,

SUHREC Project 2010/125 The Impact of Knowledge, Skills and Experience Loss from Departing Ageing Experts: An Organisational Case Study

Prof Pamela Green/Miss Selvi Kannan

Approved Duration: 19/07/2010 To 31/08/2011 [Adjusted]

I refer to the ethical review of the above project protocol undertaken on behalf of Swinburne's Human Research Ethics Committee (SUHREC) by SUHREC Subcommittee (SHESC4) at a meeting held on 4 June 2010. Your response to the review as e-mailed on 28 June and 11 July was put to a nominated SHESC4 delegate for consideration.

I am pleased to advise that, as submitted to date, the project has approval to proceed in line with standard on-going ethics clearance conditions here outlined.

- All human research activity undertaken under Swinburne auspices must conform to Swinburne and external regulatory standards, including the National Statement on Ethical Conduct in Human Research and with respect to secure data use, retention and disposal.

- The named Swinburne Chief Investigator/Supervisor remains responsible for any personnel appointed to or associated with the project being made aware of ethics clearance conditions, including research and consent procedures or instruments approved. Any change in chief investigator/supervisor requires timely notification and SUHREC endorsement.

- The above project has been approved as submitted for ethical review by or on behalf of SUHREC. Amendments to approved procedures or instruments ordinarily require prior ethical appraisal/ clearance. SUHREC must be notified immediately or as soon as possible thereafter of (a) any serious or unexpected adverse effects on participants and any redress measures; (b)

proposed changes in protocols; and (c) unforeseen events which might affect continued ethical acceptability of the project.

- At a minimum, an annual report on the progress of the project is required as well as at the conclusion (or abandonment) of the project.

- A duly authorised external or internal audit of the project may be undertaken at any time.

Please contact me if you have any queries about on-going ethics clearance. The SUHREC project number should be quoted in communication. Chief Investigators/Supervisors and Student Researchers should retain a copy of this e-mail as part of project record-keeping.

Best wishes for the project.

Yours sincerely

Kaye Goldenberg

Secretary, SHESC4

****

Kaye Goldenberg

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APPENDIX 3 – INTERVIEW QUESTIONS

Name
Title
Date of Interview
Code

Section A	Expert Profile Structured Questions	[ ]
Section B	Expert's Perspective on Gothamfield Structured Questions	[ ]
Section C	Expert's - Incidents and Stories - Individual Perspective Semi-Structured Questions	[ ]
	Expert's - Incidents and Stories - Organisational Perspective Semi-Structured Questions	[ ]

SECTION A

Expert's Profile

1. Current position title
   _____
2. Role Description:
   _____
   _____

3. Specialist in Gothamfield: _____ (field specialization)
4. Age : _____ OR

   Age Category
   a. 45 – 49
   b. 55 – 59
   c. 60 - 65
5. Gender – Male / Female
6. Ethnicity (optional) _____
7. Years' of experience in Gothamfield _____
8. No. of Roles/Positions held during time in Gothamfield: _____
9. Years' of experience in role(s) in the last 10 years: _____
10. Role Longest Held: _____ (Position Title) _____ (Date/Period)
11. Australian / Immigrant: _____
12. Educational qualifications:
    _____
13. Qualification in specialized skills:
    _____
14. Do you work most of the time individually or in a group (Weick, 2001: 333)
    Individually Team/Group
15. Do you get involved in idea generation towards innovation?
    Yes No

SECTION B

Expert's Perspective on Gothamfield

1. Do you believe Gothamfield is a market leader? In What? _____
   Yes No
2. Do you believe Gothamfield responds to opportunities and competition in a timely? (Question to address Value - Barney & Clarke, 2007: 70)
   Yes No
3. Do you believe that Gothamfield's resource is controlled by only a few competing firms?
   (Question to address Rarity - Barney & Clarke, 2007: 70)
   Yes No
4. Do you believe your competitors may face a cost or disadvantage in obtaining or developing what Gothamfield does?
   (Question to address Imitability - Barney & Clarke, 2007: 70)
   Yes No
5. Do you believe Gothamfield's policies, procedures and culture support specialists and other employees in achieving its outcomes?
   (Question to address Organisation - Barney & Clarke, 2007: 70)
   Yes No
   Which is the strongest - policies, procedures or culture? _____
6. Do you believe Gothamfield is innovative?
   Yes No
7. Do you believe your organisation’s success is mainly from the expertise the organisation has retained?
   Yes No
8. Do people have a clear idea as to how your organisation maintains competitive performance?
   Yes No

SECTION C

Experts Narrative on Incidents / Experiences / Situations

(A) Individual Perspective

1) Can you tell me the role you play in your Gothamfield? If so, can you share with me some of your experiences that describe this role?

2) Can you explain to me what you deem is critical in the role you play in your job?

3) Can you tell me what specific basic skills and knowledge you require for this role? Can you share some experiences with me to highlight this?

4) Would you be able to express diagrammatically how you deal with critical issues? (Eg: Region, Levels, knowledge, relationships)

5) Can you share with me some stories where you experienced success in this role?

6) How does your work affect the outcome of the organisational outputs or outcomes?

7) Can you reflect and account some success you contributed historically towards Gothamfield's outcomes?

8) What do you believe is your major contribution in resolving day-to-day or crisis issues? Can you share some stories on this?

9) Are you able to express diagrammatically what was involved in this process to resolve the issue?

10) Are there any special ways and needs that you would have to perform in your role?

(B) Organisational Perspective

RBV

1) Can you explain how the business knowledge in your organisation is special compared to your competitors?

2) Can you talk about how the organization helps you upskill or improve your knowledge and skills?

Processes and Routines

3) Can you talk about any major changes that has occurred in your work/role? Has this brought about new learning?

4) Can you explain how much of the changes over the years have affected the routines to your job?

5) Can you explain if without prior experience it would have been a slower learning of the routines?

6) What are some of the worst experiences you have had in participating in your Gothamfield's outcomes?
Stories of failure – will help determine the competitive edge of the organisation.

7) If and when you retire from the organisation, what will do you believe Gothamfield will miss most?

8) If you can tell ONE SUCCESS STORY to new generation Gothamfield employees that paints the picture of Gothamfield, what would that be?

Culture

9) Have there been situations where teams or individuals or newcomers wished to know 'why' that was done or know 'how' something was done? How do you handle those situations? Do you have any methods that work for this organisation and all newcomers must know?

10) How long do you believe it took you to learn and perform that way you do today? Can you tell me what major contributions you achieved?

11) What motivated you to learn and be part of this company for so long?

12) In your opinion what knowledge that you hold do you believe needs to be preserved in order for the organisation to continue its high performance? Why