THE GENERATION AND SHARING OF KNOWLEDGE WITHIN
ORGANISATIONS: MACRO LEVEL AND MICRO LEVEL INFLUENCES ON
INDIVIDUAL KNOWLEDGE SHARING ORIENTATION AND BEHAVIOUR

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ABSTRACT

The ability of an organisation to respond quickly to changing circumstances and marketplace demands has been identified as an important factor in organisational effectiveness, particularly where work innovation is involved. Hence, knowledge generation and sharing practices in an organisational setting are central to organisational effectiveness. This dissertation identifies the mediating influence of relations between organisations and their workers, and the relations among workers, on knowledge generation and sharing practices. The dissertation elaborates occurrences within a socially-constructed system, specifically, within a public sector organisational setting, that shape knowledge sharing. Through an analysis of both macro and micro level organisational practices and behaviour, it identifies factors shaping the relations between organisations and knowledge sharing. These comprise: (a) the generation of knowledge, (b) the contested nature of the process of knowledge construction, (c) the impact of the individual worker’s experience of the organisation’s internal environment on shaping their knowledge sharing orientation, (d) how the organisation is understood to value knowledge sharing, (e) the impact of relations with colleagues on knowledge sharing behaviours, and (f) the perceived outcomes of knowledge sharing behaviours.

The organisation’s external environment was found to create premises for its practices, bases for its workers’ beliefs, orientations and actions, and was an important factor influencing knowledge generation and sharing goals and activities. Factors in the internal macro-level environment (e.g. the organizing principles, control systems, networks and power relations), framed the structure, exercise, coordination and communication of individual expertise and patterns of cooperation. These are important because they constitute an introduction to the organisational dynamics that workers experience in the organisation on a
daily basis, thereby informing their perceptions, beliefs and decision-making about knowledge generation and sharing.

Salient micro-level factors that influence the development of the individual’s relationship with their organisation and their knowledge sharing orientation and are all held to act as important influences, are identified as: (a) the individual worker’s affective organisation commitment; (b) trust levels between individuals, groups and between an individual and their supervisor; (c) feelings of security (including feeling valued personally and for specific expertise); (d) role clarity and linkages; (e) rewards for job involvement and extra-role behaviour, (f) the experienced reciprocity of effort and reward, (g) experienced organisational justice, and (h) discretion to question, innovate and improve.

This dissertation makes clear connections between action and theory. Through adopting a case study approach, its contribution is uniquely integrative. It elaborates an understanding of knowledge generation and sharing practices and why these practices need to be accounted for in an organisation’s activities and social practices. Yet, because of both micro and macro level contributions these behaviours need to be understood in the specific contexts of organisation members’ activities and practices. Hence, the dissertation advances insights to inform future practice, arising from the centrality of knowledge sharing to organisations’ sustainability and the dependency on workers’ understanding of their relations with the organisation, its representatives and their co-workers.
STATEMENT OF ORIGINALITY

This work has not previously been submitted for a degree or diploma in any university. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made in the thesis itself.

Signed: _________________________________________________________

Claire M. Gardiner

Date: 18/03/2008
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A key premise for organisational success is the unique combination of resources and capabilities that creates long-term sustainability (Grant, 1996). This includes the capacity for the organisation’s staff to generate and share the knowledge required to meet its purposes, including confronting new challenges and goals. Yet, knowledge generation and sharing occur in complex ways within an organisational setting. Understanding the relationships in this setting, among individuals, their group memberships, and their context is essential to appreciating how to best foster knowledge generation and sharing in organisations.

The purpose of this dissertation, therefore, is to examine the mediating influence of relations between an organisation and its workers, and the relations among workers on knowledge generation and sharing practices. It focuses on identifying and elaborating the role and impact of factors that arise from environmental complexity, socially situated practices and micro-level mediators on an organisation’s ability to generate organisational knowledge resources that will support its sustainability.

The dissertation explores knowledge generation and sharing through enactment of practice and task accomplishment, including the mechanisms by which individuals move from novice to expert status, and the means by which knowledge relations between individuals, groups, and the organisation are developed, changed and negotiated (Lave & Wenger, 1991; Brown & Duguid, 1991; Tyre & von Hippel, 1997; Cook & Brown, 1999). Knowledge is viewed as emergent, distributed across multiple individuals, groups, and the entire organisation, and is located in people, practices, and symbols.
In introducing the dissertation, this chapter is structured as follows: (a) its context and background are established: (b) the issues for research are identified and the research questions provided, (c) the methodology is introduced and described, (d) the structure of the dissertation is foreshadowed and (e) the dissertation’s contributions are outlined.

Background to the Dissertation

Pressures to improve organisations’ sustainability are sourced in the globalisation and liberalisation of the world economy, the spread of technology and changes in the nature of work and in the demographics of the workforce (Stewart, 1997). Further, changes in the nature of organisations have given impetus to the search for new ways of ensuring organisational survival and prosperity (Handy, 1990).

Particular attention has been directed in the literature to the knowledge located within an organisation at individual, group and organisation-wide levels (Brown & Woodland, 1999), as a basis for understanding innovation processes (De Gues, 1988), professional expertise, and the construction of unique organisational knowledge (Nonaka & Takeushi, 1995; Spender, 1996; Stewart 1997; Sveiby, 1997). Consequently, over the past decade, the literature has come to address important elements of organisational knowledge (Brown & Duguid, 2001; Lawrence, Mauws, Dyck & Kleyesen, 2005; Patriotta, 2003) and the process of knowledge acquisition and development in organisations (Alvesson, 2001; Blackler, 1995; Bok, Zmud, Kim & Lee, 2005; Tsoukas & Mylonopoulos, 2004).

Literature which has developed around interest in the social construction of knowledge in workplace settings provides a particularly pertinent and rich source of information about how adults learn through and about their work (Billett, 2006; Gherardi & Nicolini, 2000) and
the factors that influence the development of their work-related knowledge, knowledge sharing orientation and enacted practices (Antonacopoulou, 2006; Borgatti & Cross, 2003; van den Hooff & de Ridder, 2004). Hence, appreciation of the importance of the general and specific knowledge resources within an organisation has grown rapidly.

This dissertation arises from the need to further understand perspectives developed around the development and management of knowledge at work. Previously, disciplines related to management, business, the study of organisational behaviour, and information management systems have pursued the topic of knowledge management from the perspective of their own theoretical and practice frameworks. Considerable conceptual diversity has resulted. These frameworks have been used to: (a) examine how knowledge generation occurs and can be managed; (b) the difference between knowledge management and information management systems; and (c) the necessity for fostering knowledge sharing for competitive advantage and organisational survival in turbulent and unpredictable operational environments (De Geus, 1988; Stata, 1989). Knowledge sharing and social practices in workplaces have also been explored (Lave & Wenger, 1991) and debated (see Patriotta, 2004), albeit from these diverse perspectives.

This earlier work established that both individual and collective knowledge generation and sharing do not occur as isolated phenomena within an organisational setting. Indeed, four main contextual dimensions have been identified as influencing knowledge at work (Hager, 1999). These are: (a) pervasive change and crisis, (b) difference and diversity, (c) the particular and local influences, and (d) the political and social dimensions of knowledge (Hager, 1999). Hager also identifies two important elements which shape knowledge at work: (a) the specific combination of features that characterise any workplace situation at a give
time and (b) the social forces that shape perceptions of and responses to workplace situations. As Patriotta (2004, p. 11) suggests, knowledge generation and sharing can best “be studied as a phenomenon in motion, through displacement, surprise, controversy and contest.” This is because these processes occur within social and physical organisational contexts differentiated by cultural, structural and relational settings that create opportunities and barriers for knowledge generation and sharing.

This goal is achieved here by examining, firstly, external environmental aspects likely to influence knowledge generation and sharing e.g. the operating environment, the nature of the industry and operational sector, the professional framework, the organisation’s values, structure, and practices, and the impact of work demands. These issues are salient as they provide workers with information about how they should act, and the expectations the organisation holds of its workers.

Secondly, issues pertinent to individual workers’ knowledge sharing also need to be examined. Individual worker characteristics and values, beliefs about their relationship with the organisation and their co-workers, extent of organisational citizenship behaviours and feelings of security, and the impact of observed organisational justice will likely illuminate individual level decision-making. Specific mediators identified here for investigation include the nature of relations among workers, the climate for knowledge generation and sharing, the processes by which knowledge is constructed and expertise is developed, the value attributed to knowledge and expertise, and potential contributors to knowledge leakage.

Taking these premises for understanding knowledge generation and sharing, the following section advances the research issues and questions that guide the investigation reported and discussed in this dissertation.
Research Issues and Questions

As foreshadowed, the key proposition advanced by this dissertation is that knowledge generation and sharing are mediated by relations between an organisation and its workers and the relations among workers, in organisation-specific and complex ways. The research questions focus on:

(a) What are the complexes of factors that shape how knowledge is generated and shared within an organisation?

(b) What are the mediational roles of factors in the external and internal environments on knowledge generation and sharing by an organisation’s workers?

(c) How do socially situated practices shape workers’ knowledge generation and sharing orientation and practice?

(d) What are the macro and micro-level factors that influence individual workers’ decision-making processes for knowledge generation and sharing?

The dissertation, in addressing these questions, identifies and reports the mediating influences of sets of complex factors shaping knowledge generation and sharing in an organisation. It is to those mediating factors that the attention of this dissertation is particularly directed. The intention here is to contribute new insights to understanding knowledge sharing through integrating existing conceptions of the reciprocal relationship between individuals, and the organisational and social systems in which they function (Schneider, Brent-Smith and Sipe, 2000). Specifically, the aim is to advance understanding about the generation and sharing of knowledge that is required to sustain effective organisational work.
The methodology adopted to address these questions and issues is now presented in overview.

Methodology and Procedures

Social science has been described as searching for understanding of a range of behaviours related to the research focus (Burns, 1994). Hence, a qualitative approach is adopted here because qualitative procedures allow the researcher to accept “the multiple realities and socially constructed meanings that exist” within social contexts (Burns, 1994, p. 12). This approach permits the richness, multiple levels of meaning and subjective nature of the research setting to be understood. In addition, since qualitative methods permit detailed investigation of selected issues without being constrained by predetermined categories of analysis, openness to unexpected data or unplanned events is enhanced (Eisenhardt, 1989; Patton, 1990; Rubin & Rubin, 2005).

The qualitative approach adopted here comprises a longitudinal, single-case investigation (Yin, 1994). The case study method is particularly appropriate where the research site is a ‘bounded system.’ That is, where the group of people being investigated comprise a discrete unit whose members identify with each other and which is extremely atypical or representative of the research issues and their context (Yin, 1994). Hence, it is useful when: contemporary, real life events are being investigated, the researcher has no control over those events, and investigative questions are the basis of the dissertation (Burns, 1994). The research design is depicted in Figure 1.
Figure 1 Outline of research design

Figure 1 depicts the outline of the research design. The dissertation’s findings are derived from interviews with selected staff within a large public sector organisation that provides railway infrastructure, long-haul, bulk freight services to the mining, shipping and general industries, and both long-distance and commuter passenger services to geographically dispersed populations. As depicted in Figure 1, respondents from professional and paraprofessional occupations provided data, from management, professional worker and trainee perspectives. Respondents ranged from novices to workers close to retirement. A series of three semi-structured interviews conducted with participants over a period of two years, allowed the interview process to identify, focus on and elaborate themes emerging over
time in the data, as indicated in this figure. The initial round of interviews established the organisation’s purpose, the respondents’ work histories and tasks. Subsequently, questions probing for more personal views and responses to occurrences were introduced in later rounds of interviews, when respondents were likely to be more at ease and willing to provide their ‘own’ views (Rubin & Rubin, 2005; Webb, 1995).

In making this case and advancing its contributions, the dissertation’s chapters are structured as follows.

Dissertation Structure

This first chapter lays the foundations by previewing the dissertation. Chapter Two identifies the macro-level issues that are central to understanding the generation and sharing of knowledge in the organisational setting. It does this by reviewing relevant literature and introducing the broad concepts that underpin the investigation of organisational knowledge. In this way, this chapter provides the rationale for the research focus, clear links to what has already been established, and the impetus for additional study.

Chapter Three discusses and elaborates the micro-level research issues, their justification, and their place within the current literature framework. It refines the concepts introduced in Chapter Two by focusing on individual workers’ considerations and practices. Issues identified in the literature are found to influence knowledge generation and sharing at more than one level. So, Chapter Two discusses issues found to influence decision-making and behaviour at macro-levels (e.g. organisation and group), while Chapter Three discusses knowledge generation and sharing at socially situated and individual levels. In sum, Chapters
Two and Three together, provide a conceptual lens through which socially situated factors influencing knowledge generation and sharing practices can be examined and understood.

Chapter Four provides the methodological justification for the research processes to be adopted, as just previewed. It explicitly addresses the issues raised by the research questions in terms of how answers to these questions can be found through a planned program of investigation. The rationale for the selection of the research procedures is provided and the processes to ensure case study quality are described. The review of relevant literature identified the focus for the investigation. From these, a priori constructs are identified (Eisenhardt, 1989) to assist the development and focus of the interview schedules of questions. Finally, a methodological justification for the research and its methods is established.

Chapter Five presents findings that explain the mediating role of the organisation’s environmental complexity on knowledge generation and sharing. In particular, it outlines the important influences on workers’ beliefs regarding what is important, how they perceive and interpret their experiences and how they respond to their organisational situation. First, shared understanding of the organisation’s goal to become a nationally dominant market force was found to guide individual and group practice during the day to day process of task accomplishment. Second, the special nature of the industry/sector and professional domains results in knowledge that is extremely contextualised and specifically constructed through their locally constituted sites of practice. So, workers’ practical knowledge is inextricably associated with its socially situated work context at immediate and embedded levels.

Third, external drivers for change, (e.g. a rapidly-evolving business environment, changes to government requirements and rising customer expectations of service delivery)
combine to create a more dynamic external environment than at any prior period in the organisation’s history. Fourth, internal organising arrangements were found to create separate local sites of socially constructed practice enacting specialised types of professional expertise. With the exception of special multi-function project teams, horizontal knowledge flows were, therefore, dependent upon personal relationships and relational connections across work unit boundaries. Together with the demands of the work itself and workload pressures which reduce opportunities for social interaction and serendipitous knowledge sharing, the organising arrangements and workload demands were found to create both opportunities and barriers to knowledge generation and sharing.

The qualitative research methodology adopted for this dissertation enhanced openness to emerging data concerned with relations, perceptions and interactions, which are reported in Chapter Six. In this chapter, findings are presented that illustrate and explain the socially situated and constructed practices that mediate the respondents’ knowledge generation and sharing behaviour. First, socialisation mechanisms (e.g. training and induction processes) played a significant role for: (a) the sharing of locally and socially constructed organisational knowledge and professional expertise, (b) locating workers within local sites of practice (in particular, novices and newcomers), and (c) facilitating role and relationship negotiations.

Second, well-developed relations with other members of the local site of practice were shown to facilitate consultation with knowledgeable other members, creating access to the organisational and locally situated memory, values and identity in a way databases are unable to accomplish. So, interpersonal relations were found to be central to knowledge sharing and problem-solving. Third, workers’ knowledge generation and sharing practices reflected the contested workplace relations of the local practice site, with political dimensions attributable
to power relations, individual and group norms and beliefs, group memberships and roles, and differential access to resources.

Fourth, innovation was found to be fostered by the nature of the work, which continuously involves new tasks and innovative responses, to new and perhaps differing presentations of previous tasks. The deep, personal expertise and emotional engagement of these workers was shown to provide unique knowledge resources and competitive advantage to this organisation. Barriers to innovation arose from pressure for conformity with proven methods, existing standards and regulations, profession-based technical issues and relational factors within the local practice site. Fifth, potential for loss of unique organisational knowledge was found to arise from: (a) absence of a strategy to reduce knowledge loss through the impending retirements of key long-serving expert workers and (b) inter-organisational knowledge exchanges which result in loss of commercially important, organisational-specific knowledge and professional expertise, which currently places this organisation at the forefront of its field.

In sum, the social construction and valuing of knowledge in local sites of practice was found to shape workers’ practice. The influence of the relational contestations and negotiations among workers was found to be important for knowledge generation and sharing.

Chapter Seven presents the results of this investigation about the importance of micro-level factors for an individual worker’s willingness to contribute to the knowledge resources of the organisation. First, workers’ professionally and personally based characteristics and orientations, (e.g. motivation, affective organisational commitment, job engagement, opportunities to continuously learn and to act autonomously in task accomplishment) were found to create an overarching framework for action. Beliefs about behaviour and job
outcomes, relational capital and social connections with co-workers and supervisors provided individual-level reinforcement. Second, co-worker trust, derived from workers’ perceptions about relational capital and their interactional history with co-workers, mediated knowledge sharing orientation and willingness to engage in knowledge sharing practices with co-workers.

Third, workers’ efforts to build micro-level relational and social capital with co-workers (e.g. through trustworthiness and organisational citizenship behaviours) were found to enhance a climate of psychological safety and create personal and task connections which facilitated knowledge sharing. Fourth, organisational rewards for innovation were interpreted by workers as legitimisation and reinforcement for knowledge generation activities. So, workers’ knowledge generation efforts and the local climate for innovation were reinforced.

In sum, Chapter Seven identifies the most important influences on workers’ micro-level knowledge generation and sharing orientation and practice. These include their beliefs about their relations over time with the organisation, with their co-workers, the rewards for such behaviour, and their own values framework.

The conclusions, contributions, limitations and avenues for future research are summarised in Chapter Eight. In the following section, the contributions of this research to knowledge generation and sharing theory and practices, (identified in Chapter Eight), will be outlined.

Contributions

The dissertation’s primary contribution arises from its identification of the role and impact of inter-relationships and mediating factors for knowledge generation and sharing in organisations that have, to date, typically been examined as separate phenomena. For instance,
Borgatti and Cross (2003) identified the impact of three relational factors on knowledge-seeking behaviour; Cabrera and Cabrera (2005) described the influence of Human Resource Management (HRM) practices on knowledge sharing; Cumming (2004) described the effects of workgroup diversity for knowledge sharing; Lawrence et al., (2005) linked organisational politics and knowledge sharing; Willem and Scarborough (2006) linked knowledge sharing with organisational politics and social capital; and Pyörä (2007) established links between organisational culture and knowledge management. Here, the extent and complexity of those relationships is identified, elaborated further and advanced as being a necessary condition for understanding knowledge generation and sharing in an organisational setting.

The contributions of this dissertation to the theory and literature of knowledge generation and sharing are four-fold: (a) the identification of complexes of factors that shape how knowledge is generated and shared within organisations, (b) the elaboration of links between the nature of individual workers’ relations with the organisations and their knowledge sharing orientation and practices, (c) the identification of the influence of an individual’s workgroup role and level on knowledge sharing behaviour, and (d) the importance of the individual’s relations with other workers for their knowledge generation and sharing practice.

First, this dissertation identifies and elaborates the nested and over-lapping nature of the integration of the relational factors mediating workers’ knowledge generation and sharing. Findings that workers’ decision-making processes concerning knowledge generation and sharing account for specific, multiple levels of frameworks and relational interactions, go beyond the contributions of previous research.
Second, the influence of an individual’s workgroup role and level on knowledge sharing behaviour is illuminated and elaborated. Knowledge generation is found to be a contested process, mediated and shaped by the nature of relations among workers and their regard for the organisation at the time of the knowledge interaction. Relations with others are found to be influenced by the interactional history among workers and the complex of factors within the local practice site.

Third, knowledge generation and sharing practices are likely mediated by individual workers’ personal, higher-level values and orientations to practice. These are found to be reinforced by locally constructed beliefs about relational capital and social connections, developed over time with their supervisor and co-workers. They are further reinforced by the experienced outcomes of their task accomplishment, interactional history with supervisors and individual co-workers, and previous knowledge sharing exchanges.

Fourth, this research locates the role of the individual at the forefront of the knowledge construction and sharing process. It demonstrates that individuals learn and generate what they believe is meaningful for the operational context, based upon interpretation of their personal and vicarious experiences, co-workers participating in the knowledge sharing interaction and their own purpose.

The contributions of the research advance theory and understanding in areas that have received inadequate attention. These include: (a) the knowledge generation and sharing practices of professionals at work (Alvesson, 2004); (b) the relations between commitment and knowledge sharing attitudes and behaviour (Hislop, 2003a); (c) links between the nature of the individual worker’s relationship with the organisation and their knowledge sharing orientation and practices (Thompson & Heron, 2006); and (d) the influence of an individual’s
workgroup role and level on knowledge sharing behaviour (Thompson & Heron, 2006). Following analyses of Lave and Wenger (1991), Wenger (1998) and Brown and Duguid (1991, 1998, 2001), Osterlund and Carlile (2006) suggest there is a need for additional empirical studies incorporating relational thinking when dealing with knowledge sharing in complex organisations. Further, the need for additional research illuminating the interrelatedness between knowledge flows and behaviour has been identified by Willem and Scarborough (2006). The concern, here, is to address gaps in the previous research.

Uniquely perhaps, this dissertation identifies sets of factors within the organisation’s environmental complexity, socially situated practices and individual worker’s micro-level day-to-day task accomplishment, that facilitate or discourage knowledge building for enhanced organisational capability. These sets of factors are the key to understanding and developing sustainability in organisations. The contributions arising from the practical investigations, while consistent with those proposed in Chapters Two and Three, extend and further elaborate the propositions advanced in those earlier chapters. Further, these propositions have been elaborated in different ways which illustrate the complexes of factors influencing workers’ knowledge generation and sharing.

This chapter has described the foundations for this research. It has introduced the research problem and specified the dissertation’s research questions. The methodology has been described, briefly, and the contributions of the dissertation established. A detailed account of all foreshadowed here is developed through the following chapters that comprise the dissertation.
CHAPTER TWO
MACRO LEVEL INFLUENCES ON KNOWLEDGE GENERATION AND SHARING IN ORGANISATIONS

This dissertation, as foreshadowed, examines knowledge sharing in an organisational setting, and proposes that it is mediated by relations between organisations and their workers, and the relations among workers. It is proposed that an organisation’s capacity to effectively use its knowledge is mediated by factors shaping the personal and organisational relationships involved in knowledge generation and sharing, and the impact of these factors on the individual’s perception of their relationship with the organisation. It proposes that relational factors are present and mediational even when the knowledge generation or sharing pertains to knowledge which is considered to be generalised and formally recognised, as in the case of the knowledge associated with a profession (for example, the engineering profession). The intention of the dissertation is to suggest a modified and coherent view which identifies and integrates the most useful perspectives to inform future practice.

To preview the case being made in this chapter, the literature indicates that the key issues in understanding the relations between organisations and knowledge sharing are six-fold: (a) the generation of knowledge, (b) the contested nature of the process of knowledge construction, (c) the impact of the individual worker’s experience of the organisation’s environmental complexity on shaping their knowledge sharing orientation, (d) how the organisation is understood to value knowledge sharing, (e) the impact of relations with
colleagues on knowledge sharing behaviours, and (f) the perceived outcomes of knowledge sharing behaviour.

To date, considerable attention has been paid to knowledge management at the organisational level within the research. Yet, a review of the literature indicates less attention has been paid to examining three important issues: (a) the influence of the industry, profession, the organisation’s mission and its characteristics on knowledge generation and sharing; (b) the impact on knowledge sharing behaviour, of an individual’s beliefs about their relationship with the organisation (Hinds & Pfeffer, 2003) and how organisations value individual knowledge and encourage knowledge sharing (Bock et al., 2005); and (c) the influence of interpersonal factors on workers’ decisions to share what they know with colleagues (Tagliaventi & Mattarelli, 2006). Together, these issues stand as being central to understanding knowledge generation and sharing in organisations.

In this chapter, these are elaborated in greater detail to guide the selection of methods for practical research. The concepts introduced in Chapter One that establish the overall framework for this dissertation are further focused on and refined. The environmental complexity of the macro organisational context gives rise to factors that influence knowledge sharing practices and behaviours. These interrelated complexes of external and internal factors will be explored and the links established, in support of the proposition that an organisation’s capacity to effectively use its knowledge is mediated by relational factors.

The chapter builds its case across five sections. First, the proposal that effective organisational knowledge generation and sharing are essential for organisations’ continuity is elaborated. Second, the importance of effective organisational knowledge generation and sharing for organisations’ sustainability is proposed. This is because market differentiation is
achieved through the organisation’s unique knowledge resources which are available to potential and existing customers (Grant, 1996; Spender, 1996a). Third, concepts illuminating the dissertation of knowledge sharing practices and behaviours in organisations arising from social learning theory and management theory are presented. This is because social learning theory provides insights into how knowledge generation and sharing occur in social settings such as organisations, and management theory provides principles which inform understanding of human behaviour and relationships within organisations.

Following that, the impact for organisational knowledge sharing, of organisations’ structural arrangements and internal environments is examined. It is proposed that these are powerful in creating the context for individual workers’ experience and understanding of their organisation. In particular, these factors shape a worker’s perceptions of what is important, valued and rewarded and how they are expected to participate. These beliefs establish the framework within which a worker will make decisions about their contributions and behaviour as an organisational member.

Finally, the influence of the contested nature of workplace relations on knowledge generation and sharing is elaborated. It is proposed that knowledge generation and sharing are enhanced or impeded by relational capital and interactional history, i.e., the nature, history and other dimensions of individuals’ relations with other workers, influence workers’ decision-making for sharing personal knowledge.

This chapter examines progress made in developing an understanding of how knowledge is generated and shared in organisations. It proposes these processes occur within organisational contexts, socially constructed, locally situated sites of practice, and relational settings. So, workers’ knowledge generation and sharing practices are proposed to be
mediated by the relationships which arise from their understandings and interactions within those settings. The chapter focuses on macro level organisational attributes which influence knowledge generation and sharing. In Chapter Three, the salience of the mediational role of workers’ relationship with the organisation and relationships among workers is elaborated in more detail.

Current Perspectives on Generating Organisational Knowledge

To date, the literature offers a range of perspectives, frameworks and models about organisational learning or knowledge generation to explain its processes and central purposes, particularly for an organisation’s sustainability. These include, for example, the foundational work on single, double and triple loop learning by Argyris and Schon (1978) and the work on knowledge creation processes by Nonaka and Takeushi (1995) and Nonaka and Konno (1998) which established the recursive and spiral nature of problem solving and knowledge generation. Exploration of the nature of learning and knowledge generation in organisations identified levels and outcomes of organisational learning (Fiol & Lyles, 1985), the role of tacit knowledge in the innovation of products and services (Leonard & Sensiper, 1998) and the interplay between knowledge and knowing as a source or organisational innovation (Cook & Brown, 1999).

Other literature establishes the importance for organisations’ sustainability of the competitive advantage arising from the organisation’s knowledge and capabilities (Hamel & Prahalad, 1993; Prahalad, 1998) and dual challenges of knowledge creation and knowledge management in organisations (Barjaria, 2000), while Kogut (2000) recommended knowledge sharing in inter-organisation networks for mutual benefit. Considerable effort has been
directed to exploring definitions of organisational knowledge (see Nonaka & Takeushi (1995)
and others) and approaches to knowledge management (see Alvesson, 2004; Cowan et al.,
2000; Duffy, 2000 and others). Spender (1996a) defined knowledge as the basis of an
organisation’s activities and described the social nature of organisational knowledge.

Expanding these ideas, organisations have been identified as distributed knowledge
systems (Tsoukas, 1996); and as knowledge communities (Wenger & Snyder, 2000); and
organisational learning has been described as situated curriculum (Araujo, 1998; Ghirardi,
Nicolini & Odella, 1998; Richter, 1998). Together, this body of literature provides a rich
starting point for this dissertation, through the provision of concepts about how employees
learn at and about their work, and the factors that influence the development of their
knowledge for work. However, the omission that emerges through an appraisal of that work is
the need to integrate the contribution for knowledge generation and sharing, of the sets of
complex factors arising from the relations between an organisation’s macro and locally
situated characteristics which influence workers’ relations with and within their organisation.
To date, this has not been addressed in an integrative way.

Much of the literature to date has developed from studies originating from a cognitive
perspective that seeks to understand the learning processes occurring in individuals for the
generation of knowledge in organisations. Simultaneously, within the management theory
areas, a growing body of work has explored the importance of the general and specific
knowledge within an organisation for its survival and prosperity (Bogner & Bansal, 2007;
Eisenhardt & Martin, 2000; Lundberg, 1995). This growth has been fuelled by international
and technological pressures including the globalisation of the world economy (Nahapiet &
Ghosal, 1998; Stewart, 1997), the development of multinational corporations and international
management practices (Bartlett & Ghoshal, 1989), the spread of technology and structural changes in the economies and nature of organisations in recent years (Dunphy & Stace, 1992; French & Bell, 1995; Handy 1990; Limerick & Cunnington, 1993). Hence, there are practical imperatives that are shaping the direction of the research that is generating this literature: an urgency to assist organisations operate effectively.

While acknowledging the importance of existing literature in establishing an understanding of the general concepts of organisational knowledge generation and sharing, this dissertation focuses on areas which have been identified as requiring further investigation. From an analysis of this literature, inadequate attention has been paid to linking the nature of the individual worker’s relationship with the organisation with their knowledge sharing orientation and practices (Thompson & Heron, 2006).

Among calls for more empirical research into the mediation effects of relational factors on knowledge sharing, Hislop (2003a) identified the importance of the employment relationship for commitment and knowledge sharing but called for examination of the relationship between commitment and knowledge sharing attitudes and behaviour. The mediational relationships among trust, access to knowledgeable others, cost of information requests and knowledge sharing are important. However, Borgatti and Cross (2003) note that the moderating influence of macro-level factors, such as organisational climate, is unclear. The links among affective commitment, the psychological contract and knowledge sharing also have been identified by Thompson & Heron (2006) who suggest the influence of workgroup role and level on knowledge sharing behaviour should be investigated to further understand these links. Further, Osterlund and Carlile (2006) analysed the relational approaches evident in the work of Lave and Wenger (1991), Wenger (1998) and Brown and
Duguid (1991, 1998, 2001) and highlighted the need for additional empirical studies incorporating relational thinking when dealing with knowledge sharing in complex organisations.

These are important issues for organisations wishing to maximise their sustainability through their aggregated expertise. While a number of separate and related issues have been explored in regard to their influence on knowledge sharing, the field lacks an integrative study which incorporates macro-level, locally situated and micro-level factors mediating individual knowledge sharing orientation and practices within organisations.

The concern here is to address gaps in the previous research. This dissertation specifically elaborates the interrelated actions, commitments and justifications that link individual and locally constructed practices with macro-level organisation considerations. It aims to elaborate the mediational role played by complexes of relational factors. It integrates influences arising from the organisation’s internal characteristics, the individual’s employment relationship and work context, and the knowledge sharing practices which result. It also addresses Alvesson’s (2004) concern that ‘surprisingly few studies have looked more carefully at what professionals and knowledge intensive organisations do at work’ (p. 58). In doing so, the dissertation focuses on relational aspects of knowledge generation and sharing rather than treating knowledge as an objectified commodity. In the next section, the broad concepts underpinning key organisational knowledge generation issues will be elaborated as a platform for ideas to be advanced.
The Generation of Organisational Knowledge: Key resource for Sustainability

The generation of knowledge and its sharing across staff within organisations is essential for their continuity and survival. New knowledge development ensures that an organisation nourishes and maximises those qualities that create its competitive advantage and, hence, its sustainability (Bognor & Bansal, 2007; Hall et al., 2000; Nahapiet & Ghosal, 1998). Put simply, maximum organisational effectiveness and achievement of strategic objectives will be difficult to accomplish without the required intellectual capital.

Three main categories of intellectual capital have been identified in organisations: human capital, organisational capital, and relational capital (Edvinsson, 1997; Fincham & Roslender, 2004). These refer to resources such as “individual competencies (for example skills and qualifications), assets relating to process efficiencies and internal structure (i.e. organisational design and culture) and, finally, to external or relational assets based on customer and external relations like supplier networks” (Fincham & Roslender, 2004, p. 324).

The implications for sustainability are that organisations need to understand their strategic objectives and organisational knowledge capacity in relation to their operating environment. Incorporation of new knowledge into the organisation’s broader operations occurs through knowledge sharing (Szulanski, 1996; Zahra & George, 2002). Attention is, therefore, required to the processes by which organisational learning or knowledge generation develops and knowledge is shared beyond the original individual worker or group.

An organisation’s knowledge base leads to the development of unique capabilities essential for identity, growth and survival (Grant, 1996; Stewart, 1997). As such, the major implications of organisational knowledge lie in the inimitability of the organisation’s capabilities, outputs, processes and practices by other organisations (Kogut & Zander, 1997).
For instance, the personal expertise and social knowledge of employees, their capabilities, relationships, networks and social structures provide unique combinations of resources and potential outcomes for every organisation. Hence, there must be understanding and acceptance of the range of factors which impact on the generation, location, sharing and value accorded knowledge and knowledgeable people within an organisation.

**Organisational knowledge**

Organisational learning includes both the generation of knowledge and the ability to critique the organisation’s basis for action (Alvesson, 2004; Senge, 1990). This occurs at a much deeper level and on a larger scale than individual learning and adaptation (Cockburn et al., 2000; Smith, 1998). For example, when workers move beyond understanding of how their organisation’s systems and structures work, to developing improvements which enhance sustainability, organisational learning has occurred through a process of reflection and action resulting in adaptation (Richter, 1998). So, knowledge has been generated.

Maximum leverage of organisational knowledge is developed and exercised at the organisational level through access, communication, synthesis, augmentation and deployment of adaptations (Marshall, Prusak & Shpilberg, 1997). The construction of organisational knowledge is a co-productive process occurring through day-to-day organisational activities, such as working in concert with others, solving problems and relating to colleagues (Brown, 1992). Here, organisations are held to be integrated structures characterised by meaning systems, social structures, formal and informal rules and routines and some degree of conflict. Hence knowledge construction is a complex, negotiated and fragile process occurring within social processes, across levels, framed by organisational structures and strategic goals, and
frequently serendipitous. Part of the complexity is exercised, however, in the actions of those who work in the micro and locally situated levels of day-to-day practice.

Communication of organisational learning is dependent on open communication paths (Klimecki & Lasslebon, 1998) and organisations have varying capacities and commitment to reviewing and learning from experience (Bapuji & Crossan, 2004). Similarly, organisations have different abilities to operationalise new knowledge to achieve strategic goals (Bogner & Bansal, 2006). As a result of the negotiated nature of knowledge construction, defensive routines, (i.e. behaviour designed to protect established norms) can create barriers to re-examining the status quo (Argyris, 2004).

Knowledge (i.e. what is possessed at a cognitive level), and knowing (i.e. what is part of action and the professional practice) (Cook & Brown, 1999) are generated and distributed in the work setting. At the individual level, “knowledge is not independent of the knower. It is existential and deals with the quality of being in relation” (Smirchich, 1983, p. 163, italics in the original) in the knowledge context. Some organisational learning can be described as accidental because it arises from both the unintended consequences of action, and through the conflicts and tensions inherent in organising (Vince & Broussine, 1996). Knowledge generation may occur despite organising arrangements and formalised communication channels, and be generated through disagreement over procedures. Alternatively, it can develop in parts of the organisation whose primary purpose is the practice of approved procedures rather than the development of enhancements to those practices. Thus, changes to the organisation’s knowledge system can be incremental and bottom up, yet differentiated across the organisation.
Knowledge systems are likely created by the power relationships and cultural codes applying to a specific body of knowledge, and transformations in knowledge systems are not cognitive, but rather the result of changes to individual roles, relationships, and the distribution of authority or responsibility (Foucault, 1972). This is important because learning that results in the enhancement and expansion of organisational knowledge may also lead to in organisational change and transformation in structure, relationships, and power (Dunphy & Griffiths 1998; Fiol & Lyles, 1985; Kanter, Stein & Jick, 1992; Senge, 1992; Stewart, 1997; Tywoniak, 2007). These are key aspects of the organisational environment within which individual workers’ knowledge sharing orientations are shaped by their experience of the organisation, and their knowledge sharing practices are subsequently enacted. Hence, individuals’ contributions to and engagement with the organisation are central to the generation and sharing of the knowledge required for its continuity.

**Knowledge generation and sharing practices**

There are practices that both shape and exercise the use of knowledge in organisations that are central to their continuity. The forms of knowledge and knowledge-based practices which are recognised and adopted within an organisational setting become institutionalised through contested processes (Alvesson, 2004). However, an outcome is that workers and organisations may regard these ‘rules’ as non-contestable norms and practices. Indeed, Potts (2001) suggests the primary function and outcome of organisational knowledge is the reduction of uncertainty through providing rules for the conduct of work.

More commonly experienced in daily functioning at the operational level, however, is the presence of ambiguity – a necessary element for innovative and novel responses to
environmental conditions and a characteristic of most work (Alvesson, 2004). While rules may be applied to clarify the task situation, the more appropriate responses to ambiguity and the opportunities it offers for innovation may be flexibility, critique, openness to ‘other ways’ and the synergy of knowledge that arises from working interdependently with others. Therefore, combinations of attitudes, knowledge and supportive processes are required to deal with ambiguity and create organisation specific organisational capabilities as the basis for competitive advantage (Bogner & Bansal, 2007). Dependence on ‘rules’ may lead to lost opportunities and failure to adapt to contextual nuances. Therefore, the generation and sharing of these rules are central to an organisation’s regeneration and continuity.

The extent to which organisational knowledge can be used may be influenced either positively or negatively by the nature of interactions, negotiations, interpersonal relationships, practice, and location within the organisation’s structure, and may be affected by context, tasks, processes, roles, relationships, authority, communication processes, and perceptions. Yet, the potential exists for knowledge generation to be highly contested through differing understandings which may arise from the range of perspectives and practices of those involved in the knowledge generation process.

The context, instrumental purposes and communication of the knowledge may add complexity and tensions which require negotiation and are subject to competing agendas and priorities. Agreement on the nature and form of the knowledge at any stage during the generation and sharing processes may be subject to the specific practices of the workers involved (Gherardi & Nicolini, 2000). For instance, among refrigeration mechanics there are differences in actions and required understanding dependent upon whether the installation context is domestic or heavy industry, yet the terminology and required outcomes may be the
same. Consequently, the potential exists for misplaced assumptions of common meaning and
dialogue, to create misunderstandings, obstruct knowledge sharing and create tensions.
Progress, therefore, likely requires collaboration, communication and identification of shared
understanding.

Tensions can arise where the fundamental, ‘taken for granted’ values of one
professional (for example, in relation to an acceptable level of risk) are contested by a
colleague whose training or socialisation has resulted in differing values. In this way, the work
practices are mediated by the underpinning beliefs and the contested nature of aspects of the
knowledge: successful organisational outcomes will depend on the negotiation and agreement
of shared understanding.

Organisational knowledge cannot exist in a relational vacuum, since it is bound up in
the localised factors identified above. Conceptualising organisations as ‘communities-of-
communities’ (Brown & Duguid, 1991) and understanding the different communities and the
relations between them is necessary before patterns of information and knowledge sharing can
be understood. This is important for workplaces because knowledge is always manifested as
social action and always mediated (Ghirardi & Nicolini, 2000). Hence, it is proposed that
central to knowledge generation and sharing are: (a) the interpretation of actions by
individuals within the systemic relations of the organisation (Gammack & Stephens, 1994),
and (b) the impact of those interactions on the organisation’s ability to effectively use the
knowledge within it.

The following sections elaborate how this process is contested and shaped in relations
between workers and organisations. This is realised as follows: firstly, the contested nature of
the generation of knowledge will be explored through the conceptual frameworks of social
learning theory and management theory. Following sections will elaborate the influence of the organisation’s structure and control mechanisms, and finally, analyse the influence of contested workplace relations on knowledge generation and sharing practices and behaviour.

The Contested Nature of the Process of Knowledge Construction

The generation and distribution of knowledge is a contested process in many, if not all, organisations. The organisation’s broad social systems and structures construct social settings which powerfully influence the behaviour that occurs within them (Barker, 1968). For example, in most organisations, new members undergo an induction and socialisation process during which they learn day-to-day operational rules and procedures applying to the practice of their job tasks within the organisation’s specific contextual requirements. In addition, workers learn cultural norms concerning standard practices (Morgan, 1998) which relate to their organisational membership in general, and more specifically, within their immediate work unit (i.e. ‘the way we do things around here’). This learning provides essential background knowledge about the organisation and understanding of both formal and informal organisational structures social practices, values, and what constitutes appropriate conduct as a member of the work unit (Argyris, 1992; Brown & Duguid, 1991; Morgan, 1998). Therefore, these social systems and structures comprise complexes of factors to instigate, stimulate, nurture, and influence organisational learning and knowledge generation.

The pervasive nature of these contextual factors means that workers’ future learning for and at work will be shaped and affected by these organisational practices (Antonacopoulou, 2006). Humans, however, are not automatons. It would be naïve to assume that induction, socialisation and training processes are understood, interpreted, and enacted in
the same way by individual workers. Adults bring their own experiences, emotional responses, perspectives and intentions to any learning experience; these act as both lens and filter when new knowledge is built upon what is already known (Knowles et al., 1995). It may, therefore, be expected that organisations’ socialising processes are also subject to worker-level judgements which may neutralise, reject or replace the organisational perspective and practice (Valsiner, 1998). So, there will be inevitable processes of negotiating understanding by those who participate in the organisation’s practices.

The role of organisation, work and social practices in organisational knowledge generation are held to be central to these negotiations and are elaborated further in the following section. Concepts arising from social learning theory and management theory provide a rich source of propositions about how knowledge is generated and shared in organisational settings. Firstly, the contribution of the social learning theory approach will be elaborated. This is because social learning theory provides insights into the influences on knowledge generation and sharing within negotiated social settings such as organisations. This is important because social learning theory suggests that these influences are derived from social relationships, actions related to membership of an expertise or profession-based group, and shared insights among workers arising from knowledgeable task performance.

Understanding Knowledge Generation and Sharing through Social Learning Theory

Social learning theory is helpful in understanding the contested nature of the generation and sharing of organisational knowledge through its perspective that knowledge generation is a social process and knowledge is situated in work practices (Cook & Yanow, 1993; Gherardi, 2000; Nicolini & Meznar, 1995). Most knowledge is considered to have a
tacit dimension - that is, arising from experience, reflection upon practice and intuition, and
deep than conscious knowing (Spender, 1996). Indeed, Tsoukas (1996) argues that ‘tacit
knowledge is the necessary component of all knowledge’ (p.14). Knowledge is considered to
be embedded in the social practices of teams of individuals sharing common experiences,
rather than within individual members (Nelson, 1991; Tsoukas, 1996). Learning and
knowledge generation are considered to impact on those who are engaged in the context in
which they occur. Therefore, social learning theory privileges the contributions of social
practice to the genesis and distribution of knowledge, rather than taking the individual as the
key organisational unit.

The basic tenet of the social learning theory to mind is that human mental
functioning is inherently situated in social, interactional, cultural, institutional and
historical context. Such a tenet contrasts with approaches that assume that
implicitly or explicitly, that it is possible to examine mental processes such as
thinking or memory independently of the sociocultural setting in which individuals
and groups function

(Wertsch 1991, p. 85)

Thus, this perspective focuses upon the context of what is known, and issues arising
from and influencing the context in which this may occur (Marsick, 1998; Polanyi, 1966;
Shulman, 1992). For instance, these issues include social systems functioning within the
context, and the structural, political, cultural and hierarchical characteristics of the context
(Easterby-Smith, 1997). Knowledge and knowing are seen to result from combinations of
individuals and contexts, incorporating organisational and biographical factors (Blackler et al.,
2000).

The development of knowledge as a socially-based activity incorporates relationships
between problem solving, goal-directed activity, learning, and the social context (for example,
the organisational or professional setting) within which these activities occur (Anderson,
Billett (1998, pp. 21-34) suggests that the social source of knowledge has five identifiable levels which integrate the key elements and are negotiated across them:

(a) the evolving socio-historic practice (e.g. notions of work);
(b) socio-cultural practice (e.g. occupation, profession);
(c) community of practice (e.g. workplace or professional setting);
(d) individuals’ personal histories (e.g. personal knowledge, work practices, perceptions and values: their ontogeny); and
(e) the micro genetic development that occurs when ontogeny and community of practice intersect through individuals engaging in activities.

In other words, doing and learning are integrated through the combination of work activities which make up the work practices, social practices and body of knowledge of a field of work (Engstrom, 1993). Learning is recognised as the process going on within the exchange of information between members of shared or interlinked sites of knowledge practice. Membership of the group is defined by the group’s members, and by the shared ways they interpret events and perform their work for example, through use of artifacts such as tools or technology. Achieving mastery of relevant artifacts can produce change in workers’ ability to leverage their position in the relations of a group, and hence their role in group knowledge sharing practices. To consider these concepts in terms of situated practice, the functioning of groups of workers as sites of situated work practice involved in active knowledge generation and sharing (Lave & Wenger, 1991) will now be elaborated.

Socially Constructed Sites of Knowledge Practice

Socially constructed sites of knowledge practice (also identified as knowledge collectives or communities of practice) have been described as consisting of groups of individual workers, characterised by their informal nature, shared expertise, passion for a joint
intent, and knowledge generation - emergent through interactions where participants together learn and construct meaning in relation to the joint interest and its environment (Brown, 1992; Brown & Duguid, 1991; Lave & Wenger, 1991; Wenger & Snyder, 2000). Such groups are considered to be more than the formally constituted groups of the organisation’s structure (for example, teams) or users in common of artefacts (Brown, 1992). Noting that knowledge becomes distributed among colleagues rather than being exclusively held at an individual level, Richter (1998) links the knowledge collective process to Weick’s (1995) ‘sensemaking’ (i.e. the learner’s acquisition and influencing of the development of knowledge within and among their trajectory of participation), but takes the process further. Incorporating the micro level individual learner’s knowledge development activities and perceptions, Richter (1998) holds knowledge as also embedded in the social and relational nature of organisational day-to-day work practices.

Knowledge is held to be a salient currency within these groups - members have to be able to give as well as source knowledge in order to remain a member in good standing (Lave & Wenger, 1991). This knowledge is usually both tacit and explicit (i.e. knowledge or principles which are the result of systematic thought and examination, from which the subjective elements have been removed (James, 1950). In sum, it may be heuristic and imprecise and combine context-independent and context-bound rules. In other words, the body of knowledge may be situated within the knowledge and/or practices of the task, job, work-group, profession and context.

An individual worker may, therefore, be a member of more than one knowledge collective grouping simultaneously, subject to multiple influences which mediate the construction of their knowledge and their knowledge sharing. These groups may have varying
scopes and foci, being narrow and specific to the immediate job task, as well, but also profession-based and founded on a formally accepted but necessarily evolutionary body of broadly-based knowledge.

For instance, when engaged in negotiations with union representatives to vary workplace conditions, human resource managers will likely proceed according to legislative requirements and agreed union/workplace protocols. In addition, these human resource manager will also draw upon their own knowledge of current industrial conditions and company policies within their workplace, and consult their own supervisor and other managers in order to identify organisational perspectives and requirements (i.e. within their organisational knowledge collective). They may also consult with the industry’s professional association and others outside their own organisation but within the industry (their industry knowledge collective). They may consult, too, with fellow human resource managers (i.e. their professional knowledge collective) for example, seeking information about similar experiences, internal events within the particular union (i.e. such as a new policy to act more aggressively or political in-fighting), and any impending legislative variations and actions in legal process which are relevant.

In this way, the characteristics of each situated body of knowledge are related to specific aspects of the work practice in the organisation, industry and profession (Gherardi, Nicolini & Odella, 1998) and therefore, constitute particular instances of sociocultural practices. This is because each socially constructed site of knowledge practice is in some way a unique social phenomenon – with its own guiding knowledge foundation, particular participants, requirements, focus and needs. An individual member’s participation and
benefits may be dependent upon and shaped by the nature and other dimensions of their relationships with other members.

In summary, the above example illustrates the negotiated and contested development process of knowledge generation and sharing in organisational settings. This includes the construction and sharing of that knowledge: the combination of different kinds of knowing and practice, the blending of experience, principles and expertise. Importantly, it also places the role of the individual in the forefront of this process. In selecting and interpreting, individuals generate what they believe is meaningful for the operational context based upon their perceptions of the information source and their own purpose.

Organisations, therefore, can incorporate multiple levels of knowledge collectives, from locally situated knowledge collectives, their processes and practices, to the organisation as a whole embracing the knowledge collectives within it (Brown & Duguid, 1991) as illustrated above. Further, in relation to knowledge sharing, the legally-constituted boundaries of the organisation may be irrelevant in that knowledge may flow freely within a larger, but understood knowledge collective (Becker, 2001). For example, an organisation may use the services of contractors on a regular or continuing basis, and readily share knowledge of its procedures and other specific information to ensure work outcomes meet the desired standards. This relationship can enhance links, such that the contractors receive not just information, but information which may be closely held by the organisation.

It follows that within such a group, the organisational boundaries have been overlaid by shared understanding, commitment to shared intent and a degree of trust. Conversely, a knowledge collective may function in a profession-based sense within an organisational setting. For instance, there is a medical profession and knowledge and skills associated with
medicine. But within a hospital setting there are also particular combinations of medical skills (e.g. radiology, pathology, oncology, paediatrics) that are pertinent to specific medical specialisations which form collectives of constructed knowledge and practice sites within the over-arching community of collectives. In each case, members participate and contribute expertise, constructing knowledge to enable relationship and task outcomes. They may develop task and social processes to facilitate their practice. Shared understandings develop through negotiation and openness to contestation, to ensure high level achievement of their shared intent. It is evident, therefore, that membership processes and relationships are fundamental to the process of knowledge construction which occurs within such socially constructed sites of knowledge practice. These are now examined in more detail.

Membership of knowledge collectives

Relational and expertise attributes mediate membership of these kinds of groups as discussed above. An individual’s progress to full participation within the collective may hinge upon what distinguishes a “novice” from an “expert.” Initial positioning and reputation within the group may derive from job title or formal qualifications. With increased interaction, the initial positioning may be revised upwards or downwards through demonstration of the actual level of contribution the new member is able to make to the community. Criteria for progression may include questions of skill (i.e. expertise, ‘expertness’, knowledge of professional practice, level of academic or professional qualification, publications on the topic, membership of professional groups), and job-related issues (i.e. organisation specific, determined by organisational or profession-based key performance indicators, level and scope
of position held in relation to other positions, industry competency standards, or market-driven standards).

The generation and sharing of knowledge is also shaped by “tradition” which reflects the influence of culturally transmitted, developed, and sanctioned constructs and ways of understanding (Mezirow, 1991). This view provides a conceptual link to those communities of practice based on generalised or formal knowledge such as professions, which in some cases incorporate not just knowledge domains, but also codes of practice and conduct underpinned by notions of ethics and values, e.g., linked to the greater public good. These professional values acknowledge and conform to the local cultural context to a greater or lesser degree, but simultaneously, may enact higher level professional values such as the Hippocratic ideals, in the case of medicine.

The communities of practice approach has been criticised on the grounds that it does not consider connection to more widely held forms of knowledge (Lorenz, 2001), for instance, non-workplace education and geographically dispersed work practices. Such criticisms appear based on a socially ordered view of micro-level communities acting without reference to their organisation, profession or craft framework. Some evidence also suggests, however, that greater knowledge generation results from frequent interactions between workers with diverse (rather than shared) knowledge sources (Un & Cuervo-Cazurra, 2004). The concept has also been criticised on the grounds that it may not account for the contested nature of knowledge construction and the reality of workplace relations. For instance, political behaviour designed to create leverage for the achievement of personal objectives (Adler & Kwon, 2002) (such as protection or improvement of an individual’s position within the organisation (Pettigrew, 1973)) is a common occurrence in organisational settings. Perhaps, as Antonocopoulou (2006)
suggests, it is more useful to consider the process of negotiation involved in the relationships at individual and organisational levels which make the learning meaningful for the context and actors: that is, between individual learning, organisational context and the discourses within the context.

Workers select, interpret and use knowledge according to their own requirements and their understanding of their situation and organisational context (Van de Ven & Johnson, 2006). This is important because their interpretation and negotiation of meaning originate from their relations with their community and organisational setting. Furthermore, their interpretation changes during the process of adoption and integration as they respond to the contextual signals in accordance with their existing knowledge, values and purposes (Feldman & Feldman, 2006). Knowledge construction and sharing can also be dependent upon or facilitated by the use of artifacts such as technology, which can in turn form part of the knowledge strategy of workers (Tsoukas & Mylonopoulos, 2004). Use of artifacts can influence both the relational nature and the outcomes of knowledge generation and knowledge sharing. Taking this theme forward, the following section examines the nature, use and results of using artifacts in knowledge generation and sharing.

Artifacts

Use of artifacts within organisations mediates access to the collective knowledge, creating the potential to enhance performance outcomes (Vygotsky, 1979). Artifacts may take the form of sets of standards, computer software, tools, drawings and tables of relationships between variables common to a field of work. For instance drafters may use computer assisted drawing software to produce drawings containing the required angles and dimensions; an
engineer may consult standards or tables to identify materials, load-bearing and length ratios when designing a bridge. During the novice stage in many fields, the beginner may make use of procedures manuals, checklists, templates and illustrations in paper or computer-based forms to carry out tasks and minimise errors. These artefacts provide particular kinds of models and scaffolding to assist and guide the learning process (Vygotsky, 1979). Use of these artifacts can hasten knowledge acquisition, generalisation to other settings and progress to more central roles within the socially constructed practice site.

Most fields of work have associated terminology, tools or equipment central to carrying out the work practice. Demonstrations of proficient use of relevant artifacts may result in a novice’s progression and validation within a group to a more central position (Lave & Wenger, 1991). Innovative use of artifacts that results in advanced or novel outcomes (that is, knowledge generation) can alter the worker’s place in the social and power relations of the group through altering co-workers’ perceptions of their expertise. Such change in the group relations may redefine the value attributed to the worker’s future knowledge contributions (Lawrence et al., 2005). Therefore, artifacts such as language and technology support knowledge generation and facilitate knowledge sharing with colleagues and the broader community (Ghirardi & Nicolini, 2000).

In summary, social theories of knowledge generation and sharing are helpful in illuminating how the role of the individual, through membership of a social practice, can become an active agent within a community of knowledge, transforming and modifying both their own knowledge and the shared body of knowledge, through their participation in and contributions to the social practice community.
Active membership and participation is held to involve both contributing and receiving ideas and information, impacting on both that individual’s knowledge and the group’s shared knowledge. Importantly, access to learned others and progressively more developmental work tasks are likely to be essential for learning progress within the community, however, these may be dependent on interpersonal relationships and the organisation’s structural or political characteristics. Opportunities for access and progress are positively or negatively influenced by relational factors in organisations and impact on the extent to which an organisation is able to use its knowledge. Knowledge generation at all levels, that is, individual, group and organisation-wide, is irrevocably interpretive, sense making, distributive, and embedded in all organisational activities. In all, the bases for these engagements are shaped by relations between organisations and their workers, and the relations among workers. At the macro level, these relations comprise the contested nature of the process of knowledge construction, and the influence of the organisation’s structure and control mechanisms and the contested nature of workplace relations on knowledge sharing orientation and practices.

Understanding Knowledge Generation and Sharing through Management Theory

Management theory also offers distinct and valuable insights in understanding an organisation’s characteristics and the ways these characteristics mediate the processes of knowledge generation and sharing. For instance, through their experience of the organisation, workers develop understanding of what is valued and valuable, and a sense of identification or alienation regarding what they perceive to be the organisation’s interests (Morgan, 1998). Their individual knowledge generation and sharing orientation and practice are shaped by this understanding. In the following section, the approaches framing discussion of organisational
knowledge generation and sharing in the management research will be introduced and explored for their contribution to this dissertation.

Utilitarian conceptions of organisational knowledge predominate in management research, with learning and knowledge generation in the organisational setting generally viewed as important tools for organisational growth, management practices, and ultimately, the organisation’s survival in a constantly changing world (Sveiby, 1997; Teece, 1998). In management theory an organisation is essentially seen as a cognitive enterprise that learns and develops knowledge (Argyris & Schon, 1978), its intellectual capital forms the basis of its competitive edge (Stewart 1997; Teece, 1998), its and innovation, information, experience, and overall organisational capability. Together, these comprise a mix of tangible, intangible, internal and external factors (Cascio, 1998; Prusak, 1997). Organisations are able to “create new capabilities” through learning, i.e. becoming learning organisations because of an “active stance of learning and development, rather than imitation of the achievements of others” (Kogut & Zander, 1997, p. 17).

Through individual learning and development, the organisation’s effectiveness can be improved (Kim, 1993; Senge, 1990; Simon, 1991) permitting it to be both a receptacle of knowledge and a collective of individuals and groups possessing and contributing knowledge (Huber, 1991; Pedlar, Burgoyne & Boydell 1991; Snell & Chak, 1998). Valuable learning arises from processes of accessing the different kinds of information held by different perspectives (Van de Ven & Johnson, 2006).

The four main processes identified by Huber (1991) are: (a) knowledge acquisition, (b) information distribution, (c) information interpretation, and (d) organisational memory. Organisational memory is defined by Walsh and Ungson (1991) as “stored information from
an organization’s history that can be brought to bear on present decisions” (p. 61). Through a process of knowledge sharing, an organisation is able to retain knowledge of past events although individual members may leave (even those with critical knowledge of the events) (Weick & Gilfillan, 1971). Huber’s (1991) four processes constitute a useful approach that acknowledges knowledge generation and sharing to be more contested, complex processes than the mere transmission of objectified information – rather, these processes are mediated by the interpretive actions of the individual organisation members and the systemic structural relations of the organisation (Gammack & Stephens, 1994; Spender, 1996).

Here, Huber’s (1991) work has particular utility in so far as it creates a framework for analysing and understanding the relational influences which promote or impede knowledge generation and sharing in each of the four processes. For example, identification of the processes of knowledge acquisition and information distribution creates opportunities to examine the contested and negotiated nature of those processes. Acknowledging the process of information interpretation facilitates examination of the impact of individual and group knowledge sharing and interpersonal behaviour. Finally, organisational memory or integration of knowledge into organisational routines (Spender, 1996b; Walsh & Ungson 1991) is mediated by a range of relational, structural and political factors which need to be understood for organisations to maximise innovation and sustainability.

If not shared, individual employee knowledge may have little effect on the accessible organisational knowledge because it informs the practice of only one worker. However, simply setting up knowledge sharing policies or electronic repositories may have little impact on enacted knowledge sharing behaviour. Suggesting that organisations have a limited role in coordinating or mandating knowledge sharing, Bhatt (2002) notes there is knowledge that is
internalised by individual workers, as distinguished from that which shared with others through work practice. Knowledge sharing can become more than the mere sharing of information or facts, comprising instead the development of increased capacity, such as absorptive capacity.

Absorptive capacity (Cohen and Levinthal, 1990) describes the way increased organisational capacity results from improved ability to access, utilise and adopt externally and internally available knowledge. This concept is useful because knowledge-sharing which results in increased capacity provides a response to the ambiguous conditions of the dynamic environment in which modern organisations operate. In conditions of ambiguity where there is no clear formula for action, decisions based upon understanding and critique will advance capability more than information and adherence to rules (Alvesson, 2004; Senge, 1992). So, while information may provide data on past success, understanding adds knowledge which will inform decision making more broadly. Further, where rules may indicate the reasons for past success, critique of procedures and openness to new ways may be necessary for novel or uncertain situations.

In management theory, changes are held to occur as a result of the impact of the interpretation of environmental events, the results of past organisational actions, the influence of key decision-makers, and the advocacy position of coalitions within the organisation (Lyles & Schwenk, 1992). Organisational knowledge forms the basis of its activities, embedded within the organisation’s espoused, formalised and officially sanctioned practices and relationships, and the workers’ situated, contingent and improvised practices at their local sites of task accomplishment (Brown & Duguid, 1991). For instance, an organisation which provides road transport infrastructure possesses knowledge capability about road design and
building, legal and financial management, project management, procurement and supply chain management processes. However, contextualised knowledge practices for process accomplishment are likely held at the local work task sites.

Describing these situated and improvised practices as the “shadow system,” Stacey (1996, p. 458) argues that the shadow system is responsible for and also the repository of new knowledge, which may challenge the accepted norms of the formal system. Links between the official and improvised practices that generate new knowledge and change the existing organisational knowledge can take place in the heuristic domain (also described as knowledge of “the tricks of the trade”) (Biggs, 1992).

Heuristics

Heuristic knowledge and procedures develop through practices that guide effective practice, because they have been proven to do so. Heuristic knowledge enriches the practice of individuals and groups, for example, in problem solving. Problem solving - the process of identifying the correct match between existing knowledge and the task characteristics (Clancy, 1997) frequently takes place through drawing upon the expertise in the heuristic domain. Heuristics incorporate expertise which can include knowledge of formal or established theory or industry best practice, the fruits of reflective individual practice and conceptualisation, or extensive exposure to the widest range of operational requirements, and can be summarised as the expertise that grows up around a task, person or organisation, together with the “tools that augment the body of knowledge” (Stewart, 1997, p. 71). For instance, ‘shortcuts’ can develop informally at an individual or group level and subsequently be formally sanctioned as a more efficient method for completing a task. In this way, ‘local knowledge’ can become the basis
for formally adopted innovations, (e.g. processes or products adapted to meet local requirements). Heuristic knowledge emerges from direct experience, knowledge construction and individual sense making (Weick, 1995).

Problem solving may involve knowledge sharing in the form of shared narratives or story-telling, in an attempt to match the characteristics of the current task with those encountered previously by colleagues. This is important for knowledge sharing, because narratives thereby become a contextualised way of both accessing and communicating organisational knowledge (Lorenz, 2001). For example, when presented with a problem that has novel aspects, a worker may consult a more experienced colleague as to how they proceeded in a similar situation. In this way, knowledge sharing occurs through the colleague’s narrative which incorporates process and practice information at general and personal levels, and may incorporate examples drawn from a range of heuristic elements. Debriefings following successful and unsuccessful events, and use of the critical incident approach (Flanagan, 1954) can similarly use narratives to elucidate heuristic dimensions, generate new insights and provide valuable knowledge sharing. Narratives also provide a way of capturing and distributing knowledge across projects, a major problem in project-based work, thereby reducing the tendency to approach new, but similar, problems from the beginning (Bresnen et al., 2003; Watson & Hewitt, 2006). Thus, the knowledge generation process is mediated by knowledge sharing based on relational factors, such as: (a) access to more experienced others, (b) willingness of colleagues to share their insights, (c) learning through practice, and (d) the openness of the less experienced worker to the knowledge being offered.
The extent to which individuals share their heuristic knowledge with others is influenced by a number of factors. The continuity-displacement contradiction is the process wherein the senior and most knowledgeable members of the community of practice share their expertise with less knowledgeable members to ensure continuity and development of skills and knowledge, thereby providing for their own displacement by those members in the future (Lave & Wenger, 1991).

However, when the individual’s expertise exists within a highly competitive employment market, the individual’s level of expertise and heuristic knowledge may be the most important basis on which employment or promotion access will be negotiated, leading the individual to see their knowledge as their only unique and hence most marketable asset. (For example, the well-known and not necessarily apocryphal story, of the expert cook who leaves out an ingredient or step when sharing a prized recipe, to ensure their results and expertise cannot be easily replicated). Following downsizing, ‘surviving’ workers may become increasingly careful and strategic in the ways they manage information and knowledge, often influenced by the fear that they too will soon lose their jobs (Volpe, 1992).

In summary, therefore, management theory is useful in identifying how an organisation’s knowledge resources are understood to lead to the development of unique capabilities essential for sustainability. Knowledge is understood to be the basis for competitive edge and innovation, which in turn require development of new capabilities and willingness to move beyond accepted procedures. Organisations are able to create new capabilities through knowledge generation and sharing. This arises through an active stance of knowledge generation and development, rather than imitation of the past or the achievements of others.
Organisational knowledge is, therefore, considered to be an important factor in the organisation’s performance especially where access to people with valuable knowledge and expertise can be crucial to an organisation’s survival. Knowledge sharing is understood to provide competitive advantage through providing opportunities for the members to learn from the broader knowledge and expertise of internal and external sources to create the unique combination of capabilities which distinguish the organisational entity.

It follows, that the organisational context for the interactions and discourse involved in knowledge generation and sharing are constituted by two key elements: the structure and political environment. It is within the organisation’s structural and political context that knowledge generation and sharing processes take place. This context provides the framework for employees’ experience of the organisation and their co-workers, shaping: (a) their knowledge sharing orientation, (b) their understanding of how the organisation values knowledge sharing, and (c) the perceived outcomes of knowledge sharing behaviour. Given their significance to the generation and sharing of knowledge, the structural and political frameworks will now be examined in more detail, firstly focusing on the links between organisational knowledge and structure.

Influence of the Organisation’s Structure and Control Mechanisms on Knowledge Generation and Sharing

The organising principles of the organisation create structures which place workers in positions to which specific levels, boundaries and attributes are attached, thereby providing a framework for analysing the politics of organising (Vince, 2001). The coordination, facilitation and supervision of task-based activities are the primary purposes of bringing
members together into formal organisations (Mintzberg, 1979; Thompson, 1967) especially where the context requires adaptability, change, innovation and cooperation (Burns & Stalker, 1961).

Organisations use organising structures to make clear how their strategic goals will be operationalised, that is, by creating patterns of work and groupings of resources in such a way that organisational goals will be effectively achieved. The structure creates a behaviour setting which exercises powerful formal and informal influence over the behaviour of individual and groups of workers, together with standing patterns of behaviour that persist independently of workers (Barker, 1968).

Structure is also a response to conflicts and tensions arising from centralising and decentralising forces, and can itself produce functional barriers (i.e. where workers are grouped into work units according to their job function), role dualities, functional diversity and interdependencies (Stacey, 1996). For example, allocating task responsibilities in a defined way may reduce conflict and tensions but create barriers to communications and knowledge flows, where these only occur along functional lines.

Centralised organisational control may assist alignment and delineation of authority but reduce flexibility to respond to serendipitous opportunities. Further, tensions may arise in the case of a worker who is part of a project team. Such workers may experience role duality where they are required to report to both their usual functional manager and the manager of the project team. Separate responsibilities may be required in their functional role and through membership of the project team. They may gain access to privileged information and have access to higher status others to which their functional manager does not have access, through their project work. Therefore, an organisation structure that prescribes who talks to whom in
the organisation may impede conversations that could develop valuable new shared understandings.

Structure may be used to specifically direct and control collaboration (Thompson, 2005). Resource allocation policy (e.g. based on proven success and track record) may impede the development of new insights through under-resourcing innovative but unproven responses to non-routine problems. Organisation structure mechanisms can, therefore, intentionally or unintentionally mediate knowledge generation and sharing by creating a framework which facilitates or erects barriers to knowledge construction and exchange among members.

The goals and values sub-systems of an organisation flow from relationships between five levels: (a) individuals within the organisation; (b) groups of people within the organisation; (c) the organisation as a whole; (d) the task environments; and (e) society at large (Kast & Rosenzweig, 1972). Because of the relationships between the levels, different and competing perceptions, interpretations and value systems may be present, creating a collage of organisational realities rather than a uniform corporate culture wherein each group acts upon its view of the world and its role in the organisation’s business. For instance, the presence of an organising structure will inevitably lead to (a) variations in priorities and values, (b) lower level organising approaches, (c) differences in perspective and understanding between both groups and individuals, and (d) the potential for conflict and political behaviour.

These outcomes are important because at the day to day level, workers enact their understanding of the organisation’s priorities (Bock et al., 2005). For example, a management priority of outstanding customer service may be interpreted at lower levels as emphasis on speed rather than low error rates. Introduction of a new salary differential to reward individual effort may lead to perceptions of favouritism. Similarly, work arrangements made within work
groups may differ, leading to different experiences of the organisation at the local level. Hence, the presence of an organising structure may simultaneously lead to better alignment of effort and increased political behaviours.

These factors shape workers’ experiences of the organisation and their beliefs about the organisation, and foreshadow the reality of contested meanings, relationships, understandings and day-to-day negotiations which occur as workers strive to carry out their tasks in order to achieve organisational goals. These, in turn, create the context which will either support or provide barriers for knowledge generation and sharing. In the following section, concepts underpinning organising principles and structures will be elaborated.

Organising principles

Capacities for creating and sharing knowledge are mediated by the organising principles that frame the structure, coordination and communication of individual and functional expertise, through which individuals cooperate (Conner & Prahalad, 1996; Nahapiet & Ghoshal, 1998; Zander & Kogut, 1995). While “structures that diffuse decision influences” (Meyer 1982, p. 533) enhance learning, the opposite is true for more formal and complicated structural frameworks. For instance, structural aspects include common methods of organising people and activities such as designing and grouping jobs, delineating authority and reporting relationships between jobs and groups. These delineations can directly and indirectly influence knowledge generation and sharing.

‘Both learning and organising are much more than rational processes’ (Vince, 2001, p. 1329). Divisions of labour often establish communication flows and protocols, and differentiate between tasks and positions in organisations and hence what is and is not the
concern of the incumbents in those positions. For example, a functionally based design will
group workers on the basis of their expertise and hence, their knowledge, potentially erecting
knowledge sharing barriers. For operational purposes this may appear to promote efficiencies
and resourcing. Therefore, traditional organisational structures such as the multi-divisional
form do not assist knowledge sharing, instead the role of the middle manager as the linchpin
of downward and upward information flows becomes more important (Hedlund, 1994).

The role of middle managers for knowledge generation and sharing is unique due to
their capacity to influence managers, supervisors and subordinates. Their influencing capacity
is also critical to creating a favourable knowledge sharing environment and representing the
values of the organisation to workers (Macneil, 2003). Based on their observations of their
manager’s ideas and practices, workers develop perceptions about the organisation’s support
for knowledge sharing and how it is valued, and whether the larger organisation supports free
information flows (Bock et al., 2005). Through such social influence processes (Lewis, 2003),
workers’ knowledge sharing orientation and future practice can be shaped.

Flatter organisation designs (for example, a matrix structure based on multi-function
project teams) may lead to improved communication and knowledge sharing (Hedlund, 1994).
This is through grouping workers into project-based multifunction teams, thereby creating an
environment for improved worker to worker knowledge sharing (Deniz & Zarraga-Oberty,
2004). Matrix structures may be difficult to manage, however, leading to blurring of
communication channels, authority and reporting arrangements.

Organisational settings provide multiple opportunities for members and their ideas to
come together, through physical proximity, scheduled and unscheduled occasions (Giddens,
1984; March & Olsen, 1976). Physically separate locations of organisational groups may
prevent serendipitous knowledge sharing and the development of information about the expertise of co-workers who are not encountered through other collaborative mechanisms. This is important because social relationships facilitate knowledge sharing (Argote, McEvily & Reagans, 2003).

The quality of knowledge transfer between organisational units has been associated with stronger improvements to performance than inter-organisational knowledge flows (Darr et al., 1995; Kane et al., 2002). Conversely, workers may value knowledge originating from external sources more than knowledge which is internal, due to status (i.e. political) considerations (Menon & Pfeffer, 2003). For example, adopting ideas and improvements originating in another unit of the organisation may be perceived as enhancing the reputation, resourcing and tasks of that unit, potentially disadvantaging the adopting unit. Thus, relations and competition between elementary organising units can facilitate or provide barriers to knowledge sharing due to the attributes workers associate with the knowledge sharing outcomes, such as increased or lowered status.

In sum, this section has discussed the potential for organisational design features to enhance or impede knowledge transfer. For example, where structures separate work groups and cross-functional networking is difficult, barriers to knowledge sharing have been internally constructed. Knowledge retention and transfer are likely to be efficient when there is a common language (such as the jargon, acronyms and commonly understood use of language within an organisational setting) (Weber & Camerer, 2003). However, lack of inter-functional communication mechanisms and interpersonal contact at the operational level may impede knowledge flows and interaction. Similarly, if rewards systems do not acknowledge cooperation, teamwork and knowledge sharing, they act as a disincentive, especially where the
time involved in such activities is not acknowledged or especially allocated. Yet, the integration of knowledge across specialist disciplines and areas or expertise is required for complex tasks, necessitating high levels of interaction and cross-level access (Bhatt, 2002).

Perhaps, as Stalk (1988) suggests, in the global, dynamic operating environment of modern organisations, well-trained employees should be encouraged to use their own judgement (e.g. within defined parameters) to make decisions to solve business problems, reducing constraints imposed by procedures and rules. The traditional coordination of activities through publicised rules, procedures and plans can mitigate against the flow of knowledge between groups not functionally related in the organisation’s structure (Bhatt, 2002), resulting in a reduced climate for individual initiative and creativity (Kim & Lee, 1995). In turn, reduced information flows and knowledge sharing can result in reduced innovativeness. Within the organisation’s structural arrangements, the mechanisms and impact of organisational control systems create an environment for work processes and goal achievement to occur. The control mechanisms in turn encourage or discourage knowledge generation and sharing.

Control systems

It is important to consider the role of organisational control systems in facilitating or impeding knowledge generation and sharing, because they shape discretion to experiment, potential sanctions or rewards. Control systems underline the contested and negotiated nature of the work environment, workers’ experience of the work environment, and relations among workers (Lawrence et al., 2005). There is a close relationship between knowledge generation and sharing, and the control mechanisms used in an organisation according to Turner and
Makhija (2006), who identify three kinds of control mechanisms. The first of these, “outcome controls,” are “mechanisms that focus on the outcomes of tasks or the specific outputs desired” (p. 203) however, the processes to achieve the outcomes are not specified, allowing diversity of approach by workers. This form of control, therefore, potentially creates ideal conditions for the generation of new knowledge.

The second control form is described as “process or bureaucratic control,” i.e. the “mechanisms that clearly specify the appropriate behaviours and processes in which the employees must engage” (Turner & Makhija, 2006, p. 207). Process controls, therefore, ensure adoption and use of organisational knowledge through ensuring standard operating systems, routines, formally structured relationships and groupings are adhered to, but may have the result that workers’ knowledge (which may be deep), is confined to their specific task requirements. This form of control may have the effect of reducing workers’ ability to innovate, share and influence organisational knowledge.

The third control system, “clan control” is “the informal socialization mechanisms that take place in an organization and that facilitate shared values, beliefs, and understandings among organizational members” (Turner & Makhija, 2006, p. 210), and incorporates use of rituals, meetings, task forces, teams and communication to develop commitment, goal acceptance and citizenship behaviour among workers. Knowledge generation and sharing increase when workers with diverse knowledge are provided with opportunities to interact (Un & Cuervo-Cazurra, 2004). Thus, clan control may be appropriate for fostering knowledge sharing, especially heuristic knowledge, through the encouragement of interactions and communication. This is important because the control mechanisms of the organisation often fall within those factors considered ‘non-contestable’ and ‘taken for granted’ and, yet, their
impact on knowledge generation and sharing practices can either facilitate flow or construct barriers. Control mechanisms contribute to workers’ experience of and perceptions about the organisation and, hence, their relations with the organisation.

These relations shape workers’ beliefs about what is valued and permitted (Bock et al., 2005) and, therefore, frame their knowledge sharing orientation and practices. However, knowledge sharing may occur outside formal bureaucratic or regulated structures, and may be transformative. Established expectations, norms and procedures may have to be disrupted or set aside for knowledge sharing and institutionalisation to occur (Beech et al., 2002).

The knowledge generation and sharing processes may require champions able to operate independently of the organisation’s control and organising principles (Howell & Higgins, 1990), or so politically sophisticated that they are able to use the structures to introduce and proselytise change through existing mechanisms (Lawrence et al., 2005). These concepts help to explain (a) why new ideas can be developed and proven at the local level but fail to be widely adopted, (e.g. through controls which hinder communication flows and the development of interpersonal relationships); (b) why innovation can fail through a disconnect between the new ways and the existing processes (such as unsympathetic documentation or authorisation procedures); and (c) why mechanisms which prevent multiple perspectives from emerging will reduce knowledge generation and sharing (Dixon, 2000; Hinds & Pfeffer, 2003; von Krogh et al., 2000).

In sum, organisational control mechanisms shape institutional relations at macro and micro levels by (a) establishing the way in which tasks are to be carried out, (b) influencing the nature of interactions at individual and group levels, (c) mandating processes and
procedures, and (d) shaping communication flows, thereby creating an environment which fosters or impedes knowledge generation and sharing.

Networks

Professional and personal networks may develop when groups of "professionals who are focused on a range of problems, issues or opportunities … network informally to exchange information, ideas and skills to build and extend their shared knowledge base” (Dunphy & Griffiths, 1998, pp. 159-160). Therefore, networks can result in both the development of the professional expertise of participants, and increased organisational capacity and knowledge, in the specific knowledge domains covered by the networks (Snyder, 1996). However, networks differ across situated sites of practice, as relations (for example, contact or interactions) may vary in size, purpose and nature (Brown & Duguid, 2001).

In ‘learning’ networks and continuous learning workplace environments, work and learning are seen as reciprocal social activities. Evidence suggests that frequent social interactions assist knowledge sharing (Inkpen & Tsang, 2005; Lane & Lubatkin, 1998; Zahra, Ireland & Hitt, 2000). Within organisations, as people work together they not only learn from doing, they develop a shared sense of what has to happen to get the job done. This may extend to a sort of mutual identity characterised by a shared and sense of understanding about who they are, and their relationship with the organisation as a whole. Networks, therefore, may extend beyond or be facilitated by the organisation’s formal structural groups, but more commonly, due to their specific focus, exist separately from the structure.

These groups may become the functional associations between workers rather than the formal groupings appearing on the organisation chart. Through their group interactions,
innovative, original and useful knowledge generation can occur (Stamps, 1997). Learning involves the whole network and is relational, “rooted in a social web of meaning and linguistic structures which qualify the process as intrinsically social” (Gherardi, Nicolini & Odella, 1998, p.283), and emerging through “webs of interactions” (Brown 1992, p. 97).

The trust that underpins knowledge sharing develops over repeated interactions, satisfactory negotiations and the development of social relations, resulting in increased opportunities for knowledge sharing. Knowledge sharing episodes will be mediated by the history of past interactions, perceptions of usefulness in regard to knowledge exchanges, and understandings of the nature of the relationship, with anticipated reciprocity influencing positive relations (Bock et al., 2005). Internal networks can provide valuable pathways of influence and communication for the advancement and integration of innovation and knowledge sharing (Lawrence et al. 2005), particularly, where the innovations are counter to established practices or beliefs.

However, while individuals may develop and share their expertise within that network, no guarantee exists that the benefits of the learning will return to the organisation if the network and the organisation are not identical or overlapping. Further, perceptions of shared identity and best interests have been found to impede the flow of knowledge which challenges accepted network norms (Lynn et al., 1996), resulting in associations which maintain the status quo rather than challenge it. The real value of networks which transcend organisational boundaries may arise from the diverse knowledge to which members will be exposed, since, as Antonacopoulou suggests (2006), organisational learning at the individual level may be constrained by the quality of the learning available, that is, the organisation itself.
In sum, learning and knowledge generation occur in relationship networks of varying characteristics, through collective actions and outcomes which are independent of the organisational structural elements (Araujo, 1998). Individuals are linked through shared expertise, interests, trust and reciprocity norms, understood as the obligation to return favourable treatment received from another (Gouldner, 1960). The benefits may accrue to the individual rather than the organisation however. This is most likely when organisational membership is not the basis for network membership, interaction or contact, for instance where the network is a grouping of professionals and the outcome of the individual’s contributions is a position with a rival organisation.

At the micro level within an organisation, failure to gain acceptance into a workplace network which erects barriers to entry or is controlled by a dominant coalition, can prevent access to knowledgeable others and political legitimacy, and so prevent the development of facilitative social relationships (Vince, 2001). On the other hand, should networks develop through organisationally structured mechanisms such as cross-functional groups and project teams, the benefits can accrue to the organisation and the individual. Learning should not, therefore, be conceived as an individual-level phenomenon as it occurs within the social and informational relationships formed by the organising mechanisms (Turner & Makhija, 2006). Formal organising structures and boundaries may have less impact on the relationships and learning that develops thorough such networks, when the pursuit of knowledge, expertise and professional relationships becomes the driving force behind the network’s interactions.

Conditions of employment, promotion, and methods of reward can be structural elements exerting a powerful influence over employees’ perceptions of what is valued and how to ‘act’ within an organisation. For instance, in organisations where individuals compete
against each other even more fiercely than they compete against their competitors, knowledge access and transfer may be adversely affected. The reward and promotional systems in such organisations are active disincentives to knowledge sharing and cooperative learning and the formal structural elements downgrade positive interpersonal functioning and helping behaviours. Since knowledge sharing is typically a helping behaviour at the interpersonal level where social and informational ties overlap (Thomas-Hunt, Ogden & Neale, 2003) organisational rewards will mediate workers’ understanding of the extent to which the organisation values knowledge sharing behaviour.

In a highly competitive internal environment, social ties will be strong within groups but weaker between groups which are competing, and knowledge sharing behaviour can be expected to reflect the respective strength of these ties. The overall organisational outcome may be unsatisfactory knowledge sharing and performance due to negative impact of the formal control mechanisms (Turner & Makhija, 2006). In sum, organisational management needs to consider the flow on effects of the socialisation and control processes which are adopted, as workers look to these to understand how they are to relate to the organisation and each other on a day to day basis. These understandings inform their actions at the local and broader levels and there is the potential for interpretations which differ from those intended by management but which nevertheless will shape workers’ practices.

Among those facets of the macro level environment which provide understanding and inform action is the workers’ experience of power relations at the individual, group and whole of organisation levels, and it is to this issue that attention is now directed.
Power

Power has been defined as ‘the ability or potential to influence’ (Fiol, O’Connor & Aguinis, 2001, p.224) and is considered to be an attributed perception. So, workers attribute power to others and are influenced by them, based on what they perceive to be the characteristics of those others. For example, power is commonly attributed on the basis of a co-worker’s position and authority within the formal structure (e.g. positional power), expertise (e.g. referent power), membership of a powerful group and/or perceptions of close links to powerful others, or apparent ability to achieve favourable outcomes (e.g. political power) (Fiol, O’Connor & Aguinis, 2001).

Examination of the influences which mediate knowledge generation and sharing requires examination of the organisational dynamics and power relations present (Vince, 2001). Power relations create the political context within which workers enact workplace organising principles, norms, hierarchical and interpersonal relations – social relationships at work inevitably play out within power and influence relationships (Tsoukas & Mylonopoulos, 2004), which influence the politics of knowledge construction and institutionalisation (Edelman, Bresnen, Newell, Scarborough & Edelman, 2004). For example, power relations will leverage the contribution and insights of those seen to be expert and central, over those seen to be novices and peripheral. Similarly, knowledge sharing occurs within power relations which shape the nature of the exchange, the validation, interpretation and meaning attributed to the knowledge shared (Crossan et al., 1999), the likelihood of reciprocation, and the specifics of collective memory (Marshall & Rollinson, 2004).

In management theory two modes of power which have implications for knowledge generation are described: episodic power and systemic power (Lawrence et al., 2005).
Episodic power refers to actions by individuals to influence their situation, the actions of others and organisational decision-making such as resource allocation and performance evaluations, and is commonly referred to as political behaviour/activity (Hardy & Clegg, 1996). Systemic power is dispersed through the organisation’s social systems and processes, for example socialisation processes which shape norms of beliefs and behaviour, and technological systems which manage information and require workers to follow specific procedures (Scott, 2001). Where power relations are stable, ‘formal authority operates as a background capability supported by the reproduction of pre-existing rules and norms’ (Marshall & Rollinson, 2004, p.S83). When the stability of power relations is disrupted, for example by the development of new ideas or information which challenges accepted practice (that is, through knowledge generation or sharing), political behaviours can result.

Although Tsoukas (1996) argues that organisational knowledge is “inherently indeterminate” (p.22), organisational imperatives for the alignment of effort and task accomplishment frequently require negotiation, agreement and closure in order to proceed in concert. Such negotiations may result in political behaviours as attributions of expertise, within-group perceptions of expertise rankings, and formally derived roles or authority are contested (Lawrence et al., 2005; Marshall & Rollinson, 2004). Similarly, the reality of organisational requirements means that disrupted or unsatisfactory group progress may cause group functioning to be questioned, and contributions, roles, social interactions and relationships to be examined and possibly re-negotiated. Systemic power may be used to force change through the authority provided by the formal structure of positions (Pfeffer, 1981) in order to achieve strategic objectives.
Asymmetrical power relationships are characteristic of organisations, which are typically hierarchical and multi-faceted (Brown & Starkey, 2000; Clegg, 1981; Pettigrew, 1992). For example, even in organisations that have flattened their structure and reduced the rigidity of hierarchical levels and communication flows, there will inevitably exist groups and individuals that have greater access to resources, information, and opportunities for learning than other groups. It is most likely that the former will continue to be those who are held accountable to the organisation’s owners or shareholders and, hence, have direct access to power and the means of increasing their power (Coopey, 1995a, 1995b; Snell & Chak, 1998, p. 338). In the final analysis, major policy decisions will continue to be made by the elite group, with the organisation members at best being merely consulted, and more extremely, being manipulated into thinking that they have a degree of power that is non-existent (Coopey, 1995a). Management must show that they are prepared to consult and share knowledge with others at other levels in the organisation, not just the upper levels, to avoid the development of employee cynicism (Goh, 2002).

The organising principles, operations, internal environment and power relations of public sector organisations exhibit distinctive characteristics in a range of dimensions which differ from corporate sector organisations (Moynihan & Pandey, 2007). The key to successful knowledge generation and sharing in the public sector may lie in collaborative partnerships which draw on the interactive communicative processes between people (Haynes, 2005; Stacey, 2001). In public sector research, the sociohistorical context has been identified as a key influence (Perry, 2000) and the implications of this for knowledge generation and sharing in public sector organisations will be elaborated in the next section.
Public sector organisations

Earlier research has identified a range of differences between corporate sector and public sector organisations which have implications for knowledge generation and workers’ sharing practices (Massey, 1993; Scott & Falcone, 1998). For example, the purpose of public sector organisations is usually directed towards provision of services for the general community, a broader scope than the profit interests of a particular shareholder group, and potential capability to impact upon the lives of many (Baldwin, 1984).

Public sector organisations operate in a multi layered environment, where overall direction and accountability requirements arise from the political environment, community needs and expectations, concern for the public good, environmental considerations, government regulations, together with macro and micro economic imperatives (Hughes, 1994, Parker & Bradley, 2000). The actions and performance outcomes of public service organisations and their workers are subject to scrutiny from the public, the parliament, cabinet ministers, government regulations, the business community and the media, due to their presence and impacts throughout communities and levels of activity.

Public sector organisations are fundamentally different from corporate sector organisations in certain key features (Parker & Bradley, 2000). For example, while private sector organisations have demonstrated a results orientation, public sector organisations have demonstrated a process orientation (Rainey, 1999) arising from their service delivery and frequent supervisory function. Public sector organisations have a significant policy development role, whether at local, regional or national levels, and their policies impact upon diverse communities and large numbers of people. Hence, historically, public service has been
uniquely underpinned by notions of the public interest in a way that is foreign to the corporate sector (van Bockel & Noordegraaf, 2006).

The public interest has been defined as majorities which are formed to serve the public interest through mechanisms such as Parliaments (Pesch, 2003), and the public service organisation’s role is then to carry out that majority will (Goodnow, 1967). Pennock (1962) argues that the sum of all individual interests is not the same as the public interest, as it does not recognise all interests, in particular, the interests of future generations which must be protected as they do not yet have a voice of their own. Finally, since the public interest is shared by members of the public by virtue of that fact that they are members of the public (Goodin, 1996), the public interest occupies a higher moral ground than individual, organisation or sectional interests (Hede, 1970).

Traditionally characterised as bureaucratic in nature and operations, there has been pressure for change away from administratively focused operations and hierarchical organising arrangements in recent years (Clarke & Newman, 1997; Hoggett, 1996; Osborne & Gaebler, 1992). For example, Hood’s (1991) influential New Public Management (NPM) framework advocated ‘downsizing, organisational disaggregation, managerial autonomy, greater competition, quasi-market mechanisms, public-private synergy, catalytic role, output controls, performance standards, concern for results, and responsiveness to customers’ (Haque, 2007, p. 180).

Efficiency and output measures are highlighted in the NPM framework. Governance emerges as a new term (Dent, van Gestal & Teelken, 2007), suggesting self regulation which provides support for good performers, but enacts sanctions, increased scrutiny and regulation for inadequate performance (Hood et al., 2000). The influence of NPM has become global
(Haque, 2007). In many western countries it has resulted in higher levels of efficiency, transparency, flexibility, customer focus and outcomes orientation (OECD, 2005). Certain negative outcomes have also been noted from the reform process, for instance, reduced public service culture and public confusion over accountability through increased outsourcing and contracting arrangements (OECD, 2005). Impacts on knowledge generation and sharing have been noted: loss of organisational knowledge and knowledge sharing have been identified due to the dismantling public agencies, increased use of contractors and downsizing (OECD, 2005).

Concern has been raised that private sector type performance measurement at individual worker, team and organisation level are inappropriate, where external factors (such as political expediency) and public service principles such as impartiality, concern for the community and fairness may not be given due consideration (Dent, Chandler & Barry, 2004). In other words, adverse impacts may arise from pressure to achieve more with less resources and reduced emphasis on the public good (Dibben, Wood & Roper, 2004). For instance, in relation to safety and construction values, a contractor’s perspective may be confined to the specific requirements detailed within tender and contract documentation (for example, a bridge which must be able to carry specified traffic for a lifespan of 20 years), while in contrast the public service organisation may instead have an overarching philosophy related to the public good and long term goals (for example ‘our bridges are built to last – they will safely serve the public for at least 100 years’). Similarly, a public service focus on public safety may be incompatible with pressure to deliver services using a market driven approach, leading to compromises in methods, materials and risk levels to users.
Implications of the NPM for workers’ commitment and trust levels may be negative, since research has demonstrated that many public sector employees are highly engaged and motivated by notions of public service, personal task identification and individual level perceptions of the worthwhile, communitarian nature of their tasks (Kim, 2005). This is because organisational commitment and trust are necessary for knowledge sharing to occur. Where an organisational environment diminishes factors which foster commitment and collaboration, there may be negative outcomes for workers’ relations with the organisation and hence knowledge sharing.

“Public organisations are not just a means to produce outputs; they are also social institutions in which individuals interact and influence each other in the context of a structured environment” (Moynihan & Pandey, 2007, p.42). While private sector managers characteristically focus on ‘morale, productivity, efficiency and growth’, public sector managers have traditionally focused on ‘effectiveness, quality, public service and service to the community’ (Bradley & Parker, 2006, p.92). Thus, under NPM public sector work environments may potentially become less collaboratively based due to the introduction of individual performance measurement and imposition of sanctions. Knowledge sharing is more likely however, where collaboration is high, workers identify with the organisation’s goals and values and competition between workers is low.

In summary, organisational capacities for creating and sharing knowledge are mediated by the organising principles framing the structure, coordination and communication of individual and functional expertise, through which individuals cooperate (Conner & Prahalad, 1996; Nahapiet & Ghoshal, 1998; Zander & Kogut, 1995). These capacities in turn shape workers’ perceptions of their situation and relations with the organisation and with each
other. The way in which organisational structures and the control processes are designed will affect knowledge flows. Knowledge access and transfer can be adversely affected by formal organising structures and boundaries, the processes by which workers cooperate and exchange information, and the criteria and methods for reward systems and the values and behaviours they are seen to espouse. Where the environment supports knowledge sharing, workers’ beliefs will in general terms reflect that positive value. Their actions however, will be mediated by other powerful factors which colour workers’ perceptions and actions: the political context and experienced workplace relations.

In the next section, key features of organisations’ political context will be described and the contested nature of workplace relations will be elaborated, to further understanding of the practices, relationships, and processes that promote or act against knowledge generation and sharing in organisations.

Influence of Contested Workplace Relations on Knowledge Generation and Sharing

Earlier, it was proposed that the generation of knowledge and its distribution is influenced by the individual worker’s experience of the organisation’s internal environment, hence the nature of interactions and negotiations which provide the context for day to day workplace relations is important. Much management research focuses on objective control and management mechanisms without acknowledging the contested, practice-based and human essence of knowledge generation (Lanzara & Patriotta, 2001). Knowing is ‘an ongoing social accomplishment, constituted and reconstituted in everyday practice’ (Orlikowski, 2002, p. 252). The enactment of knowledge generation and sharing practices is accomplished in relation to an organisational context and a range of inter-relationships.
An organisation’s ability to develop improved levels of knowledge will be influenced by factors which are inherently political in nature. For example, at a macro level, differences in individual, group and organisation value systems, power relations, patterns of influence and social standing, perceptions and levels of cooperation may influence knowledge sharing processes. Similarly, worker situated issues relating to privilege and access, formation of coalitions, levels of trust and feelings of ownership towards knowledge may influence workers’ feelings about their relationship with the organisation and their colleagues (Lawrence et al., 2005; Marshall & Rollinson, 2004).

Ignoring political and sectional issues associated with learning is naïve, notes Leavy (1998) suggesting that many organisational learning processes are inherently political (see also Hardy, 1996; Krackhardt, 1990; Starbuck, 1982). Institutions such as organisations facilitate some forms of exchange and combination but may limit their scope. The result is a constant juxtaposition of potentially opposing forces (Etzioni, 1996; Ghoshal & Moran, 1996; Nahapiet & Ghoshal, 1998). Learning that reinforces the status quo can be systemised in ways that are “unseen and undiscussable” especially in relation to lower level learning (Pascale, 1991, p. 239). Following Foucault (1976, 1980), Alvesson (2004) suggests ‘knowledge is neither innocent nor a neutral tool…but is closely related to power” (p. 57). As noted earlier, episodic power or political behaviour refers to actions by individuals to influence their situation, the actions of others and organisational decision-making such as resource allocation and performance evaluations (Hardy & Clegg, 1996). The goals of the personal political behaviour may or may not be consistent with those of the organisation (Valle, 1997). The political nature of higher and lower level learning processes is not yet fully understood and should be investigated further (Leavy, 1998), as without comprehension of the impact of
political behaviour for knowledge generation and sharing, organisations will fail to recognise, internalise and act upon new ideas (Lawrence et al., 2005). This is important for organisations’ sustainability because if new ideas are rejected or ignored, an organisation may face not only stagnation but loss of valuable workers due to frustration.

There can be simultaneous tensions both organising for and organising against knowledge generation, (e.g. attempting to change and trying to remain the same) since learning will result in some degree of change. Resistance can develop across individuals, groups and the organisation, creating organisational dynamics around the new learning. Hence, political activity can both “free people up to voice their opinions” (Coopey & Burgoyne, 1999, p. 286) and “mute peoples’ voices and distort their opinions” (Vince, 2001, p. 1344). Interestingly, those workers possessing critical knowledge may hold more power than their managers (Davenport, Jarvenpaa & Beers, 1996). For example, gaining greater expertise requires that a worker invest in activities (such as training, extra practice or experimentation with innovative techniques). Expertise can lead to status as a knowledgeable worker and influence through the provision of expert advice to others, leading to differential status as an expert. Knowledge generation and sharing can, therefore, be both influenced by and exert influence upon power relations. So, power, enacted as political acts, stands as another means through which the generation and sharing of knowledge are mediated.

**Norms and Beliefs**

Individual members of an organisation may be bound together through the visions, values, and sense of purpose that represent the mission and goals of the organisation (Morgan, 1997). As noted earlier, the goals and values of an organisation flow from relationships
between five levels: individuals within the organisation, groups of people within the organisation, the organisation as a whole, the task environments, and society at large (Kast & Rosenzweig, 1972). As a result, different and competing value systems may be present within any organisation, creating a collage of organisational realities rather than a uniform corporate culture, as each group acts upon its view of the world and their role in the organisation’s business. Indeed, the normal state within most organisations is some degree of conflict and difference in perceptions and priorities, rather than consensus (Van Maanen & Barley, 1985).

Different norms, beliefs, and attitudes can lead to the development of specific sub-cultural practices which can impact upon the organisation in different ways. These include information flows, cooperation, the valuing of one activity over another, the privileging of one individual or group over another, the adoption of regimentation or experimentation as a norm, social practices, and the formation of coalitions which may be in support of the formal organisational values, or in opposition to them (Morgan, 1997). Workers can subscribe to shared norms and beliefs without acting upon them, for instance policies or norms relating to an accepted ‘general good’ which a worker accepts but does not actually follow (Lundberg, 1995). For example, this might include policies relating to personal use of company property or use of the internet during company time to research personal interests. Hence, actions at the individual worker level may be the outcome of a range of influences which go beyond organisational rules and expectations. This is important for organisations which attempt to promote technologically and policy-based knowledge management practices, rather than rely on person to person interaction.

The distribution of power among different groups and networks within organisations will lead to contested knowledge generation and sharing processes requiring negotiation of
meaning, relations, and understandings (Brown & Duguid, 1991). Knowledge within an organisation can remain entirely at an individual level, shared within a group, or dispersed through the entire organisation. The sharing of knowledge is influenced by the individual worker’s perception of their relationship with the organisation, the perceived benefits of sharing the knowledge, and, therefore, its value (Brown & Woodland, 1999). Since an individual’s knowledge may a source of value, employment, recognition, status, and financial reward, the sharing of individual knowledge symbolises an expression of commitment and trust in the worker’s relations with the organisation.

Groups

Characteristics of group members have been found to impact on information sharing and group dynamics. For example, groups made up of workers who know each other share information more readily than newly formed groups who do not (Gruenfeld et al. 1996). Differences in status may affect the extent to which members can influence the group as a whole (Kirchler & Davis, 1986). Social relations, as noted above, are often based on unequal relationships (Verodnick et al., 1988). Access and participation are unlikely to be uniform due to hierarchical stratification, job design or social relationships, and an individual’s role, recognition, or responsibilities (Billett, 1998) and issues arising from political and structural aspects of an organisation. Additional status and perceptions of higher performance among group members have been found to be associated with expertise (Wittenbaum, 2000) and perceptions of high status social ties (Kilduff & Krackhardt, 1994). Acknowledged expertise can also lead to involvement in higher-level tasks or projects, which can then provide access to other organisational areas, knowledge, and participation in interactions with higher status
colleagues (Thomas-Hunt, Ogden & Neale, 2003). Information sharing has been shown to be higher when group members’ expertise is made known (Stasser et al., 2000).

In summary, these aspects of group functioning are important because knowledge generation and sharing in daily work practices are situated in the contested, negotiated nature of workplace social interactions. The popularity of team and project based work assignments and project-based groups in matrix organisational structures in modern organisations means that many workers carry out their organisational responsibilities as group members whose beliefs and behaviour are shaped by their group membership and roles. The norms and practices of the group provide the context and values for individual knowledge sharing decisions and actions, as a result of which individuals may experience rewards or sanctions from other group members.

Admission to a group may be facilitated through mentoring by more senior, more expert members of those less expert. Considerable evidence exists on the development opportunities of such mentoring, to provide access to conceptual knowledge which would otherwise remain inaccessible to the novice, in addition to the provision of models, coaching, and scaffolding (Palinscar & Brown, 1984; Brown & Palinscar 1989; Collins et al., 1989). Hence the range of work-related activities to which an individual gains access will impact on their learning opportunities, and their ability to access developmental guidance and more challenging learning opportunities may determine the path of their professional progress. Further, an individual’s access to more advanced knowledge development opportunities may be influenced both positively and negatively by the regard in which their mentor is held, and the mentor’s positioning within the group and organisation. Progress may be determined more
by political factors related to patronage and mentoring than by the individual’s own knowledge and ability.

Within a work group, significant experiences may occur in patterned ways as a result of the kinds of factors advanced, and be dealt with according to the understood conventions, technologies, values and norms of the group (Brown et al. 1989; Scribner, 1985; Rogoff, 1990). Clearly, the possibility of conflicts arising from political, structural, and cultural origins is present, since there may be as many understandings of the group’s conventions, values and norms as there are members and objectives. Acknowledgement of the opportunities and barriers for learning inherent in such conflicts in an organisational setting is an important issue for management. Organisations which are, for example, engaged in hierarchical de-layering, formation of cross-functional groups, or a climate of continuous improvement in order to foster innovation and preparedness for change, could expect to experience increased political activity and political behaviours such as ‘gatekeeping’ (Coopey, 1995; Easterby-Smith, 1997; Kanter, 1989; Kanter, Stein & Jick, 1992).

“Gatekeepers” can develop considerable power through using their position or the organisation’s structure to open and close channels of communication, influence the speed and distribution of information flows, provide summaries or analyses of current realities according to their interests, and hence shape the organisation’s view of, and response to, its environment (Lyles & Schwenk in Prusak, 1997; Morgan, 1997). Gatekeepers can also influence downwards from superiors to subordinates, horizontally, and upwards from subordinates to superiors (Tsang, 1997). Conversely, it should also be noted that political conflict within organisations can lead to pressure for innovation, modernisation, reassessment of direction, and new ways of working together, that can generate positive outcomes for the organisation.
(Coopey & Burgoyne, 2000; Whitely, 1995). Indeed, ultimately, knowledge generation is a political activity and without the use of political behaviours to promote and diffuse new ideas, integration into wider organisation systems would not occur (Lawrence et al., 2005).

Some individuals or small groups (e.g. charismatic leaders, groups with direct access to powerful individuals) can become disproportionately powerful, even if they are not members of the formal structure of the organisation. For example, “Power accrues to the person who is able to structure attention to issues in a way that in effect defines the reality of the decision-making process. By controlling knowledge and information these workers can systematically influence the definition of organisational situations and can create patterns of dependency” (Morgan, 1997, p. 179). Individuals can, therefore, perform a valuable role in using their understanding of systemic processes and control mechanisms to engage in support activities for new ideas and dissemination of useful knowledge. This political behaviour provides a positive conduit from the individual worker or group location to the broader institution for knowledge generation and sharing (Lawrence et al., 2005).

The role of middle management for knowledge transfer and interpretation into action both upwards and downwards (Nonaka and Takeushi, 1995) is inherently political. In the aftermath of downsizing campaigns, many organisations have discovered that the reduction of middle management ranks has also led to reduced knowledge generation, transfer and access (Marshall, Prusak & Shpilberg, 1997). This is important because when there are no visible rewards for knowledge sharing, managers may see critical knowledge as a source of power and a means of internal competitive edge (Goh, 2002). Politics may underlie and result from the behaviour of supervisors and co-workers, and from organisational policies and practices (Ferris et al., 1996). For instance, Weick (2001) notes “when people act, they bring events and
structures into existence and set them in motion. People who act in organisations often produce structures, constraints and opportunities that were not there before they took action” (p. 225).

Evidence suggests that employees at lower levels in organisations perceive politics to be more influential, perhaps due to their lack of control over such processes (Ferris & Kacmar, 1992) while supervisors are more regularly involved in political activities (Drory, 1993). However, following attribution theory, individuals may attribute political motives to colleagues’ actions, if they themselves would have carried out the action with political motives (Valle, 1997). Support for the basis of knowledge sharing as relationship-dependent, is provided by Goh’s (2002) finding that an adverse impact results from a distant or difficult relationship. This is important for knowledge generation and sharing: the relational quality may produce adverse knowledge sharing outcomes for individuals, groups and the organisation.

Political impacts shaping knowledge generation and sharing may arise from individual workers’ sense of possession of ideas, innovations and work outcomes. We often feel that we own what we have created, produced, or influenced, since we own our labour (Locke, 1690). An individual’s psychological ownership grows when time, ideas, skills and energies (physical, psychological and intellectual) have been invested. The workplace object of the investment may be an idea, a skill, a product, or the organisation itself. Feelings of ownership grow stronger, and the relationship between the individual and the object grows stronger, as the worker develops more information and better knowledge about it, and develops a set of presumed rights concerning the object (Pierce, Kostova & Dirks, 2001). In this way, there can be an especially powerful sense of ownership through the investment of time, energy, and
even identity, where an individual has created or been party to the creation of an object – in particular, in the case of an identifiable idea, skill or product, that in turn, mediates engagement in knowledge sharing.

At the macro level, it is common for workers at all levels with a sense of ownership of their organisation, to wish to influence the direction taken by the organisation (Rodgers & Freundlich, 1998) and to expect to have a voice in decisions affecting it (Kubzansky & Druskat, 1993). These desires reflect commitment, identification and the strength of the worker’s perceptions about their relationship with the organisation.

Finally, there are a range of specific, adverse factors which can emerge from the organisation’s macro level internal environment as barriers to knowledge generation and sharing. In the next section, a range of these barriers and their impact for knowledge generation and sharing will be examined.

**Barriers**

It is useful to consider the origin and implications of barriers to knowledge generation and sharing in organisations to identify possible solutions for the future, as barriers can become difficult to ameliorate once they are established (Bock at al., 2005; Ruggles, 1998). For example, at the macro level, a climate that is intolerant of failure (Leonard & Sensiper, 1998) and experimentation may lead to the development of defensive routines by workers (Argyris, 2004). Further, a work environment where social interaction is limited or closely controlled (Thompson, 2005) may reduce creativity arising from informal interactions.

At the micro level, emotional identification as the originator or ‘owner’ of expert knowledge (as outlined above), can potentially place knowledgeable individuals in conflict
with organisational expectations. Conflict may arise where ‘the owner’ feels their expertise, professional reputation, and the effort expended in gaining their expertise and reputation, are not sufficiently valued. Indeed, feelings of loss, stress and frustration may develop if there is major alteration by others, to objects towards which workers feel strong ownership. The outcome may be resistance to sharing, attempts to prevent others from gaining control over it or disaffection (Bartunek, 1993; Pierce, Kostova & Dirks, 2001).

A shared sense of purposeful identity may have a more positive impact on behaviour, compared with a directive approach based on compliance with norms and rules (Alvesson, 1993). Loyalty to co-workers, professional associates and the profession can be more important among knowledge workers than loyalty to their employing organisation (Capelli, 2000; Feldman 2000). The strength of personal relationships with peers and within workgroups may determine the organisational loyalty and commitment of valuable experts (Dess & Shaw, 2001). The individual’s identification with their networks and situated sites of practice can become stronger and more rewarding than their membership of the overall organisation (Alvesson, 1993; Morgan, 1986).

“Poaching” of entire social and knowledge networks by one organisation from another has been reported, where the group has been identified as having knowledge valuable to the “poaching” organisation (Wysocki, 2000). Similarly, “poaching” organisations are reported to be increasingly targeting individuals who are pivotal to the networks in which they function, to “lure” valuable other network members across to the new organisation (Capelli, 2000). The perception that knowledge and expertise are not valued within an organisation may provide sufficient grounds for individuals and groups to experience disillusionment and diminished commitment.
Understanding the relationship between emotional response and politics in organisational learning is important, for example “an understanding of the emotions and power relations that underpin initiatives designed to promote learning is a necessary aspect of any attempt to organize learning” (Vince, 2001, p. 1346). Emotion and politics form part of the conscious and unconscious dynamics surrounding and impacting upon organisational knowledge sharing because they colour the individual’s perception of their relationship with the organisation and their colleagues and hence shape their knowledge sharing orientation.

The relationships between organisational structures and processes, the distribution of authority and the influence of key decision-makers, and the advocacy position of coalitions within the organisation have the potential to impact both positively and negatively on the organisational knowledge structure (Coopey, 1995a, 1995b; Foucault, 1972; Lyles & Schwenk, 1997). Barriers can prevent the effective use of organisational knowledge: e.g., ideology that distorts the transmission of meaning, political behaviour, communication problems arising from structural or cultural factors, and insufficient opportunities for sharing and dialogue (Hayes & Allinson, 1998). Similarly, traditions that have outlived their usefulness, inappropriate disbelief about new ideas and technologies, and misconceptions about the facts concerning a situation based upon false or outdated assumptions, can inhibit knowledge creation, development and sharing.

Recognition of a need to learn and adapt may be impeded by an organisational culture which values unity of perspective so highly that internal dissent is not permitted (Brown & Starkey, 2000). Implementation can be inhibited by communications that are not received or understood properly; delays when a situation will deteriorate without prompt action; unnecessary costs and steps associated with bureaucracy; and avoiding opportunities because
they are found in unattractive circumstances (Morgan, 1998, Senge, 1992). “Learning does not always lead to intelligent behaviour…the same processes that yield experiential wisdom also produce superstitious learning, competency traps, and erroneous inferences” in organisations (Levitt & March, 1988, p. 335). For instance, organisations are staffed by people and operate in an imperfect world: mistakes occur, perceptions and emotions colour actions. Experience both informs practice and acts as a barrier to new information and insights, assumptions are arrived at and acted upon, and it is in acting, that knowledge may be formed after the event (Marshall & Rollinson, 2004).

In summary, organisational knowledge generation and sharing occur within social practice situations that comprise workplace settings. The knowledge generation and sharing practices are valuable and useful because of the contextualised relevance properties they have in relation to the setting and interactions, for example the specific organisation, work group or profession. While most knowledge generated in an organisational setting will have some intrinsically useful properties, its greatest significance lies in relation to the context in which it arose and the workers whose practice it informs. In other words, its significance is relational and situated in the social practice of the setting (Bourdieu, 1977; Osterlund and Carlile, 2005).

While organisations are generally considered to have four key assets - financial, physical, information, and people, it is only the human assets which have the capabilities to innovate and generate new insights, and engage in the social interactions which give meaning and value to the knowledge so generated (Swartz, 1997). Acknowledging the recursive and practice based interactions (Giddens, 1979) that characterise knowledge generation and sharing, the issues elaborated above provide support to the dissertation’s proposition.
Conclusion

This dissertation proposes that knowledge sharing is mediated by relations between organisations and their workers, and the relations between workers. In this chapter important issues influencing the relations between organisations and knowledge sharing have been identified as: (a) the generation of knowledge, (b) the contested nature of the process of knowledge construction, (c) the impact of the individual worker’s experience of the organisation’s internal environment on shaping their knowledge sharing orientation, (d) how the organisation is understood to value knowledge sharing, (e) the impact of relations with colleagues on knowledge sharing behaviours, and (f) the perceived outcomes of knowledge sharing behaviour.

In this chapter the research proposal was advanced, that knowledge generation and sharing in organisations is mediated by relations between organisations and their workers, and the relations among workers. Second, effective organisational knowledge generation and sharing are advanced here as essential for the development of unique knowledge resources to underpin organisations’ sustainability and market differentiation. Third, factors underpinning knowledge generation and sharing were identified and established. Two key conceptual approaches (i.e. social learning theory and management theory) were introduced to establish a conceptual basis for the context of the research proposition. Social learning theory provided insights based on understanding of the socially situated nature of knowledge generation, and sharing through locally situated sites of practice and artifacts. Management theory then provided insights based on a view of knowledge generation and sharing as essential for an organisation’s increased capacity for learning and hence sustainability, and the contribution of heuristics to knowledgeable practices within organisations.
Fourth, the influence of organisational structures is elaborated, (for example, the organising principles, control systems, networks and power relations) to further understand how these frame the structure, coordination and communication of individual and functional expertise, and patterns of cooperation. Organising structures were established to potentially facilitate or impede knowledge generation and sharing, through creating barriers to social interaction and knowledge flows outside prescribed groupings.

Fifth, contested workplace relations were proposed to include political characteristics arising from formal and informal structures and workers’ group memberships create additional influences mediating knowledge generation and sharing. Further, norms and beliefs at organisation, group and individual levels operate as additional complexes of factors, creating opportunities for creativity, knowledge generation and increased absorptive capacity, and barriers to knowledge sharing through organisation, group or individual worker practices. Finally, barriers to knowledge generation and sharing were highlighted, to identify relationships among macro-level, external and internal environmental mediators which discourage knowledge generation and constitute barriers to knowledge sharing and increased organisational capability.

In sum, factors in the external and internal macro organisational context were explored and their links to knowledge sharing practices and behaviours established. These provide an introduction to the organisational dynamics within which workers experience the organisation on a day to day basis, informing their perceptions and beliefs about what is and is not valued, and decision-making regarding knowledge generation and sharing. Examination of the complexes of factors at macro-environmental levels that shape how workers relate to and within an organisation is essential to understanding the generation and sharing of knowledge.
required to sustain effective organisational work. In the next chapter, factors at the individual worker level which shape and which mediate knowledge sharing orientation, practices and behaviour will be presented.
CHAPTER THREE
THE MEDIATIONAL ROLE OF WORKERS’ RELATIONSHIPS WITH THE ORGANISATION AND THEIR CO-WORKERS ON KNOWLEDGE GENERATION AND SHARING

The salience of the mediational role of workers’ relationships with the organisation and relationships among workers for knowledge generation and sharing is now elaborated. In the previous chapter, factors in the macro organisational context which influence the relations between workers and their organisation and hence, knowledge-sharing practices, were presented. This chapter discusses interrelated complexes of micro-level influences (i.e., those at the situational level) that shape individual workers’ understanding of and relationship with the organisation and their colleagues. These, in turn, shape individual knowledge-sharing orientation and behaviour.

Knowledge sharing is held to be necessary for an organisation’s competitive edge, resilience, capacity to innovate and even its survival. The origins of organisational knowledge, and hence the bases through which it might be shared, have been extensively appraised, as discussed in the previous chapter. However, individual discretionary decision-making regarding the process of knowledge sharing is less well addressed in the literature. This decision-making likely arises from understandings informed by individual-level experiences of the organisation (Kim & Lee, 2006). This is because an individual’s experience is shaped by personal and specific factors (including their engagement) arising from the organisation’s formal and political contexts, as detailed in the previous chapter.
Here, it is proposed that micro level factors influencing the development of individual’s relationship with the organisation and their knowledge sharing orientation include: (a) individual workers’ affective organisation commitment, which is mediated by (b) trust levels between individuals, groups and between the individual and supervisor; (c) feelings of security; including feeling valued personally and for specific expertise; role clarity and linkages; (d) rewards for job involvement and extra-role behaviour; (e) the experienced reciprocity of effort and reward; (f) observed organisational justice; and (g) discretion to question, innovate and improve.

In Chapter Two, it was proposed that the field lacks an integrative study which links macro level, socially situated and micro level factors mediating individual knowledge sharing orientation and practices within organisations. In this chapter, the relational aspects of knowledge generation and sharing are identified and discussed.

In identifying these relational factors, this chapter is structured as follows. Firstly, it delineates the complex of factors influencing the development of the individual’s relationship with the organisation and their knowledge sharing orientation. These factors inform an understanding of the development of worker perceptions, how workers create meaning within the organisation, attribute motivation and rationalise their observations and experiences on a day-to-day level. These factors provide the framework for the chapter: their formation and role as mediating influences at the individual worker level will be presented in the sections that follow.

The first section examines the influence of the individual’s affective organisation commitment, (incorporating the concept of social capital), on workers’ knowledge sharing orientations. The second section advances the central role of trust in the relationship between
the worker and the organisation and in the relationships amongst workers. In the third section, the outcomes of feelings of security which arise from workers’ perceptions of the organisational support received and the nature of their psychological contract with the organisation will be elaborated. Following that, the links between knowledge-sharing practices and organisational citizenship behaviour, reciprocity norms and organisational justice are discussed. These are salient because they extend notions of what is required, what is expected, and how contributions such as knowledge sharing are valued (Tagliaventi & Mattarelli, 2006; Wasko & Faraj, 2005). Finally, the implications for knowledge generation and sharing that arise from an environment in which workers have discretion to question and innovate will be discussed (Collinson & Wilson, 2006; Perry-Smith, 2006).

The chapter concludes by summarising the arguments presented in Chapters Two and Three in support of the proposition that knowledge sharing is mediated by the relations between organisations and their workers and the relations amongst those workers. This concluding section advances the propositions to be investigated and leads to Chapter Four which elaborates and justifies the ways these propositions are investigated.

Influences Guiding Individual Knowledge Sharing Orientation and Behaviour

Knowledge sharing and the individual’s affective organisation commitment

A worker’s overarching regard for their organisation, i.e. their affective commitment, provides both lens and filter through which they interpret their experiences and the actions of others, and so colours the decision making process about their knowledge sharing practices. Affective commitment concerns: (a) the employee’s identification with, (b) emotional attachment to, and (c) involvement in the organisation and its goals (Clugston et al., 2000). It
seems that individuals’ affective commitment grows when time, ideas, skills and energies (i.e. physical, psychological and intellectual) have been invested in the organisation (Pierce, Kostova & Dirks, 2001).

Affective commitment is an emotion-based psychological commitment, derived from the worker’s perspective of their experiences in and with the organisation, their supervisor and their colleagues. As a result, on a day-to-day basis, individuals make decisions regarding their engagement, participation, and sharing of knowledge construction within the organisational setting independently, subjectively, and interpretively (Billett, 2002). Evidence has established that higher levels of commitment generate beliefs that ‘the organisation has rights to the information and knowledge one has created or acquired’ (Jarvenpaa & Staples, 2001 p. 156). A positive affective organisational commitment forms a powerful framework for individual decision-making regarding knowledge sharing because it is based on ‘internalisation of organisational attributes, goals, and achievements by the employee’ (Harris & Cameron, 2005, p.160).

Affective commitment carries psychological benefits for employees (Meyer et al., 2002) and has been linked with strong interpersonal ties to co-workers (Cameron, 2004). Interestingly, employees’ affective organisational commitment is positively linked to a high level of social values in the organisation’s vision statement (Clugston et al., 2000, p. 139). This may be important for public sector organisations, where provision of goods and services may be undertaken to deliver a public good rather than achieve a profit for shareholders. Therefore, commitment to an abstract notion of ‘a public good’ may require what Shamir et al., (1993) refer to as unconditional commitment – an internalised personal or moral commitment and a belief in shared values between worker and organisation. High levels of
shared values have been found to facilitate trust and knowledge-sharing among organisational members (Bock et al., 2005). Therefore, knowledge-sharing behaviours should be mediated by a relationship between worker and organisation characterised by positive affective commitment and strong perceptions of shared values.

Earlier research has established that differing foci (for example colleagues, workgroup, supervisor, organisation) attract differing levels of commitment from individual workers (Becker et al., 1996; Cohen, 1993) and that work experience variables have a direct effect on affective commitment. For example, following Lewin (1948), supervisors and co-workers were found to have the strongest influence on individual workers’ attitudes and behaviours (Mathieu & Zajac, 1990). Within workgroups, an organisation’s vision and goals might be translated into norms that set out the accepted range of actions and behaviours for members in the form of normative behaviours (Bommer, Miles & Grover, 2003). Individuals are more likely to exhibit positive behaviours in workgroups where they are common, explicitly exercised and expected (Bommer, Miles & Grover, 2003). That is, the workgroup acts as a lens through which the individual identifies what information and behaviours are important. So, it seems where positive affective commitment is present in a worker’s relationship with their organisation and workgroup norms encourage, recognise and value knowledge sharing behaviours, knowledge sharing could be expected to be more common and to be performed for the good of the organisation.

The purpose and tasks of the workgroup may influence the locally constructed norms, beliefs and practices. For instance, certain professions (e.g. engineering, medicine) demonstrate community service ideals (Brooks, 1967; Schön, 1991), which provide an overarching values framework and orientation to action. Further, some professions (e.g.
engineering) are characterised by their basis in science and technology, and a focus on the achievement of efficiency through the design and construction of products or solutions to problems, which improve quality of life (Schein, 1999). In such professions, problem-solving and discretion to generate new solutions are essential to task accomplishment.

Individual behaviour at the team level is mediated by members’ shared perception that team functioning is based upon a psychologically safe environment. A psychologically safe environment is characterised by open and trustworthy interactions and smooth collaboration in solving problems (Baer & Frese, 2003). This kind of climate allows interpersonal risk-taking and encourages presentation of new ideas without sanction (Edmondson, 1999). In such an environment, social capital - understood as the network and assets associated with that network (Bourdieu, 1986) or more simply, the goodwill engendered by relationships among people in groups (Adler & Kwon, 2002), develops and is likely to be exercised. It is the concept of social capital and its influence on knowledge sharing behaviour that is now discussed.

**Social capital**

Social capital has been found to foster cooperative behaviour, reduce opportunism and increase mutual understanding through relationships (Nahapiet & Ghoshal, 1998). Hence, it is likely to facilitate knowledge generation and sharing. Unlike market relations (through which goods or services are exchanged) and hierarchical relations (through which submission to formal authority is exchanged for material security), social relations are distinguished by an exchange of ‘favours and gifts’ (Adler & Kwoon, 2002 p. 18). For instance, just as the kinds of relations engaged within a family are distinct from market-based relations, social capital
offers a distinct set of bases for the organisation and sharing of knowledge. Social capital is a product of the relationships in the groups or networks, not an individual attribute (Mouw, 2006) and is characterised by the dimensions of shared goals, norms and trust. Its focus is on the “social connections” (Willem & Scarborough, 2006, p. 1345) (e.g. dimensions, uses and outcomes of relations among workers for individual, group and organisational knowledge sharing and other purposes) and potentially shapes the social context framing knowledge-sharing behaviour. For instance, social capital can accrue in social connections afforded through networks: of workers with similar interests or expertise, of peers, of shared language (for example, professionally-based jargon), of respect and friendship, and networks of shared experience such as those linking members of past project teams. Networks have been found to provide exchange of information that is more sensitive and richer, where a high degree of solidarity and trust are present (Krackhardt & Hanson, 1993).

The effects of social capital “flow from the information, influence and solidarity it makes available” to a worker (Adler & Kwon, 2002, p. 23). In other words, social capital is based on relationships – the combined resources in, through and accessible via relationships which an individual worker has developed and maintains in the organisation or socially situated site of practice - thus providing invaluable resources (Inkpen & Tsang, 2005). Taken at the ‘public good’ level within an organisational setting, the benefits of social capital are available not only to those who contribute to its development, but also to members of the larger body (Kostova & Roth, 2003).

Active membership of a work or social practice setting may provide access to the larger network of relationships of the group, even when the individual may not yet have contributed to those relationships (Kostova & Roth, 2003). This potentially creates
opportunities for knowledge sharing access within those relationships. Notions of a more broadly based public good and service sentiment have been associated with the engagement of many workers in public sector organisations (Brewer, Selden & Facer, 2000; Wright, 2001). Indeed, this may shape the conduct of their work and obligations to share knowledge. So, relationships, networks of trust, respect and interactional history provide an overarching framework for action which influences orientation to knowledge generation and sharing. These act as a lens through which workers interpret the actions and motivations of the organisation’s representatives and their co-workers. Based upon these interpretations, workers respond and contribute to the organisation’s capabilities and social capital through knowledge sharing. In the next section, influences on workers’ knowledge generation and sharing practices arising from the special nature of public service work are considered.

Public service motivation

There is some evidence to suggest that public sector organisations have specific characteristics that shape the motivation and values of some workers engaged with them. (Buelens & Van den Broeck, 2007; Perry & Wise, 1990) and have implications for knowledge sharing. These differences are important for knowledge generation and sharing as they influence workers’ understanding about their relationship with their organisation, their job role and how they should conduct their work practices. For example, private sector workers are held to value economic rewards more highly (Crewson, 1997, Houston, 2000). However, public sector workers (a) are less motivated by challenge and personal growth (Jurkiewicz, Massey & Brown, 1998), (b) show a stronger service ethic (Wittmer, 1991) and (c) are more strongly interested in working in a supportive (Buelens & Van den Broeck, 2007), stable, and
secure working environment (Jurkiewicz, Massey & Brown (1998), than workers in the private sector. A positive relationship has been found between high public service values, commitment and intention to stay (Crewson, 1997; Naff & Crum, 1999). Public sector employees have been found to value helping others more than private sector workers and to value financial rewards less (Boyne, 2002; Wright, 2001), although for one occupational group, engineers, Crewson (1997) found similar results across public and private sector workers. In sum, public sector workers tend to be more motivated by job content, recognition, autonomy, and opportunities to learn (Buelens & Van den Broeck, 2007; Houston, 2000) and feelings of safety in role (Kihlgren et al., 2003). Affective commitment is positively linked to engagement with the public service organisation (Kim, 2005) and its goals (Wright, 2001).

Perry and Wise (1990) describe public service motivation as “an individual’s predisposition to respond to motives grounded primarily or uniquely in public institutions and organisations” (p. 368). For instance, some public sector workers with high levels of public service motivation may resist or subvert managerial control if they believe the public interest is under threat (Brewer, Selden & Facer, 2000). Three underpinning motivation constructs (i.e. rational, norm-based, and affective) have been identified and all three are valued by public sector workers (Brewer, Selden & Facer, 2000). Rational motives relate to participation in policy development, and close links between projects and the personal interests of the worker. Norm-based motives are a desire to carry out public service. Affective motives are based upon personal perceptions of the worthwhile, communitarian nature of the tasks being executed (Kim, 2005).

High levels of public service motivation (Rainey & Steinbauer, 1999) and organisational citizenship behaviour are demonstrated by effective government organisations
These findings are important antecedents to knowledge sharing orientation and practice by workers in public service organisations, as they indicate the origin and intensity of some influences shaping relations between workers and their organisation. It is likely that a collaborative approach of partnerships between managers, professionals and service clients underpin successful knowledge sharing practice in public service organisations (Haynes, 2005; Stacey, 2001).

In summary, therefore, knowledge sharing decisions seem mediated by interpersonal considerations, the relation between the individual and the organisation’s social practices (Valsiner, 1994), contextual expediency, pragmatic assessments of perceived value and individuals’ differential access to resources and information. Specific constructs contribute to a worker’s organisational commitment. In particular, underpinning trust levels between workers, their organisation and colleagues, the nature of the psychological contracts between workers and their organisation, perceptions of organisational support, and organisational citizenship behaviours. These are detailed and linked to knowledge sharing orientations and practices. The following section focuses on the essential, facilitative role played by trust.

Knowledge Sharing and Trust

Trust occupies a central role in the relations among workers and between workers and their organisation. Increased opportunities for knowledge sharing arise when the interaction history between co-workers and workers and the organisation is characterised by trust and cooperation (Chowdhury, 2005; Rastogi, 2000). Trust has been found to underpin willingness to share personal knowledge with others and openness to receiving knowledge (Levin, Whitener & Cross, 2006; Mooradian, Renzel & Matzler, 2006).
Trust - generally considered to be willingness to be vulnerable to the actions of others (Mayer, Davis & Schoorman, 1995), is based on the assessment of one party’s intention to account for the well-being or interests of another in a transaction or relationship (Bromily & Cummings, 1995; Dean, Brandes & Dharwadkar, 1998; Hosmer, 1995). It denotes a belief that ‘the results of somebody’s intended action will be appropriate from our point of view’ (Misztal, 1996, pp. 9-10). It has been described as “an altruistic act that increases the outcomes for the other while either decreasing or risking a decreased outcome for the truster” by Messick and Kramer (2001, p. 95). Trust is a psychological orientation underlying practices and behaviours (Rousseau, Sitkin, Burt & Camerer, 1998). Therefore, trust may increase the correctness and amount of information available to others (Droege & Anderson, 2003), thereby impacting on information flows within organisations.

Trusting can be viewed as an aspect of the organisational citizenship behaviour construct, incorporating pro-social behaviours such as altruism, interdependence and fairness (Fichman, 2003) and cooperation, openness to social interaction and opportunities (Yamagishi, 2001). Trust underlies much coordination and cooperation – basic and essential organisational activities (see Abrams, Cross, Lesser & Levin, 2003; Nahapiet & Ghoshal, 1998; Dietz & Den Hartog, 2006 and others). The presence of trust is important for organisations’ sustainability, as productivity has been shown to be higher within firms which cultivate trust than in those which do not, implying that both those firms and their employees have a comparative advantage (Chami & Fullenkamp, 2002). Trust can determine whether people stay within or leave an organisation (Dess & Shaw, 2001). Trust is mediated by perceptions of the strength and history of interpersonal relationships, the transactional setting,
social context (e.g., within groups and networks), social norms, and institutional norms and values (Rousseau, Sitkin, Burt & Camerer, 1998).

Trust is also a key element in individuals’ decisions to share valuable knowledge or provide guidance to others who may eventually displace them (Dirks & Ferrin, 2001). This sharing is mediated by underlying emotions that respond to perceived trust violations and disappointments (Frank, 1988), and “modulate trusting behaviour and the decision-making process associated with it (Fichman, 2003, p. 154). Therefore, the individual’s future knowledge sharing practice are likely shaped by the history of their relations and interactions with colleagues.

Three phases are often associated with trusting relationships: (a) an expectation of behaviour by another, (b) a willingness to be vulnerable, and (c) a risk-taking act (McEvily et al., 2003 p. 93), and each has implications for knowledge-sharing. Importantly for knowledge sharing practice, the expectations of behaviour by others are based on an aggregation of judgements made by the individual offering the trust, on a range of characteristics of the trustee (Dietz & Den Hartog, 2006). A list of eleven mediating characteristics underlying assessment of trustworthiness has been identified by Butler (1991), namely: integrity, competency, consistency, discreetness, fairness, promise fulfilment, loyalty, availability, openness, receptivity, and overall trustworthiness. These are consistent with four broader, more general attributes: ability, benevolence, integrity and predictability (Cunningham & McGregor, 2000). Considered together, these inform a worker’s decision to be vulnerable to the actions of another. Benevolence is understood from a perception of mutual kindness of regard and concern for welfare; competency is associated with the individual’s capabilities and the value of the knowledge exchanged; attributions of integrity derive from beliefs about
honesty, fairness and absence of hypocrisy; and finally predictability is assumed from judgements made about the consistency and ‘track record’ of the trustee’s history of interactions and behaviour (Dietz & Den Hartog, 2006).

Where there is little or no relationship based on interactions, initial judgements of trust may be advanced, based on an individual’s membership of a group to which trust is attached (Williams, 2001). For example, when a new employee is introduced to members of other work groups, initial trust is extended to the newcomer derived from the existing base of trust associated with the group. This attribution of trustworthiness facilitates task achievement and collaboration in the absence of a history of personal interactions (McKnight, Cummings & Chervany, 1998). For example, trustworthiness regulates knowledge sharing with new appointees and provides essential firm-specific information in order that job performance by the newcomer can occur efficiently. The second form of trust occurs when individuals decide to actually trust the other party based on further interaction, behaviour information and history of trustworthiness (Dietz & Den Hartog, 2006) and to proceed to action (McEvily et al., 2003). This decision is based on the party’s actions rather than attributions. Therefore, while initial attributions of trust may assist knowledge sharing early in a co-worker acquaintanceship, development of more meaningful and closely held expertise exchanges will probably depend upon the new worker’s demonstrations of the elements noted above, for example, integrity, loyalty and benevolence towards the trustor. Where these are found wanting it is likely that knowledge sharing will remain superficial or cease.

The risk dimension of trust is considered to be an essential condition, as “Uncertainty regarding whether the other intends to and will act appropriately is the source of risk” (Rousseau, Sitkin, Burt & Camerer, 1998). Rather than indicating foolishness or naïvete,
trusting and being trustworthy are behaviours that allow the parties involved to exploit opportunities which otherwise would not be available to them (Fichman, 2003). Knowledge flows will be facilitated by altruistic assumptions of trustworthiness and reciprocal interactions (Baer & Frese, 2003). However, where high-trust individuals continue to trust, the potential increases for opportunistic behaviour to occur (Dirks & Ferrin, 2001). For example, high trust individuals may be exploited by colleagues who do not reciprocate, whose knowledge sharing is less reliable or of lower quality. So, over time and interactional history among workers, knowledge sharing relations may well deteriorate or cease if reciprocal expectations are not fulfilled.

In certain circumstances, as Fichman (2003, p. 154) notes, “Signals of distrust by others may increase an actor’s willingness to be self-interested, reducing the likelihood of strong reciprocation,” hence, trust may at the same time provide the conditions under which both cooperative behaviour and opportunistic behaviour might occur (Dirks & Ferrin, 2001). In high-trust situations, groups are highly motivated to work towards group goals, with high levels of information exchange, shared learning and cooperative behaviour (Droege & Anderson, 2003). In low-trust situations, groups may work towards individual goals, resulting in low levels of information exchange and shared learning, high levels of competitive behaviour, and higher levels of self-protective behaviour such as the withdrawal or diversion of resources (Dirks, 1999), e.g. knowledge resources. For instance, knowledge sharing implications may result from knowledgeable individuals restricting or withdrawing access to their knowledge resources where the organisational setting is characterised by low trust or suspicion. Yet, beyond personal attributes and sentiments are organisational mechanisms that shape knowledge-sharing.
Organisational mechanisms facilitating trust include: (a) stable and secure employment conditions, (b) network ties, (c) supportive organisational leadership, (d) role models and (e) culture, together with (f) institutional mechanisms such as a low-control orientation, decentralisation and low formalisation (Nooteboom, Berger, & Noorderhaven, 1997). Generalised norms of trust are assisted by increased emphasis on cooperation, openness to information, discouragement or lowered emphasis on competition between workers; and emphasis on understanding of organisational goals and values (Nahapiet & Ghosal, 1998). These act to facilitate trust as both practice and expectation among workers. Therefore, institutional controls (eg high levels of formalisation and centralisation), tensions arising from individual and group goals, high levels of organisational politics, asymmetries arising from structural position and an impersonal, competitively-oriented organisational culture mitigate against trust development and manifestation. Therefore, these factors encourage entrenchment of individualised, distinct identities operating individual agendas and goal systems, potentially diminishing knowledge sharing orientation and practice.

Thus far, it has been argued that workers’ knowledge sharing orientation and practice is mediated by their affective organisational commitment and the degree of trust and trustworthiness perceived within the worker’s experience of the organisation and the relations with colleagues. It has been proposed that organisational environments will foster collaborating and cooperating, trustworthiness and knowledge sharing behaviour, when interpersonal behaviours such as inclusiveness, open communication, and valuing people are highly regarded. Even so, the sharing of knowledge will be dependent on individuals’ acceptance of these qualities. In the following section, it is proposed that the worker’s knowledge sharing orientation is influenced by their feelings of security in the organisation.
The link between knowledge sharing orientation and practices and feelings of security is illuminated by concepts relating to organisational support theory and the psychological contract. These concepts are now elaborated.

Knowledge Sharing and Feelings of Security

Discretionary work behaviours such as knowledge sharing are influenced by employees’ perceptions of their relationship with the organisation (Orr, Sackett & Mercer, 1989). Relationships, trust and cooperation develop over time and repeated interactions (Nahapiet & Ghoshal, 1998). Organisations’ actions to foster feelings of security, feeling valued and discretion to question will promote stable employment relationships (Coleman, 1990). High levels of worker satisfaction with their job security have been found to positively influence worker performance (Yousef, 1998). Job security has been found to positively influence workers’ psychological wellbeing (Burke, 1991) and organisational commitment (Iverson, 1996). Job insecurity has been linked negatively to organisational commitment and performance (Rosenblatt & Ruvio, 1996) and job satisfaction (Ashford et al., 1989). Job satisfaction, that is, a positive emotional response to various facets of one’s job (Locke, 1976; Judge et al., 2001), is positively related to motivation, job involvement, organisational citizenship behaviour and job performance (Kim, 2005).

Other factors can be more important for individual workers, for instance, some workers who are strongly motivated to work in public service occupations are less concerned with self interest (Brewer, Selden & Facer, 2000) due to their conviction that public service is “an important process that involves serving others and the nation” (p. 262). In this case, workers’ high levels of identification with the public service organisation’s mission and the
community service nature of its task take primacy over individual concerns, and are likely to lead to collaborative and extra role behaviours such as knowledge sharing to assist achievement of the mission.

Working collaboratively, mutual supportiveness and assisting fellow workers require commitment to the workgroup, willingness to cooperate with others, and a perception of reciprocated trust in fellow employees. For example, regular contact, dialogue and relationship monitoring build a sense of mutual interests, trust, relationship development and nourishment. Through these means, the worker’s connections with the organisation at the macro level and their workgroup at the local level become more dense, contributing to their sense of belonging and understanding of their relationship with the organisation. Perceptions develop about the support received, the extent to which promises made have been fulfilled, and the level of reciprocity experienced. These perceptions form the basis for and shape the nature of future action. In the context of this dissertation, the perceptions act to influence knowledge sharing practice and behaviour. In the following paragraphs, the contribution of organisational support theory to knowledge sharing behaviour is discussed.

Organisational support theory

Organisational support theory derives from an anthropomorphising process wherein employees develop beliefs about the extent to which the organization values their contributions and cares about their well being (Aselage & Eisenberger, 2003). The beliefs arise from the worker’s judgements about favourable or unfavourable treatment received, for instance, rewards, supervisor support and procedural justice (Rhoades & Eisenberger, 2001).
Perceived organisational support (POS) includes beliefs about help being provided by the organisation when needed to perform in-role tasks and deal with difficulties, reinforcing a sense of belonging and identification with the organisation (Stingelhamber & Vendenberghe, 2003). It is congruent with person-fit theories (Edwards, 2001) which link personal values and organisation values and their interaction. Perceived organisational support (POS) results in affective commitment to the organisation, generalised feelings of obligation to help the organisation to achieve its goals, and increased beliefs that organisational citizenship behaviours and performance above requirements will be noticed, valued and rewarded (Aselage & Eisenberger, 2003, p. 494). These are important issues for the creation of positive relationships between worker and organisation and, therefore, positive knowledge sharing orientations.

Beliefs about favourable POS are an antecedent to the development of affective commitment (Meyer & Allen, 1997). It should noted that both indirect and direct exchanges between the parties can influence the relationship, and Homans (1961) notes that indirect exchanges can in fact supplement or replace direct exchanges. This means that, firstly, the relations between two parties can be mediated by third parties (Homans, 1961), and secondly, the rewards may be experienced in an indirect or roundabout way rather than directly (Fuller et al., 2006). For example, heightened affective commitment may focus on a positive relationship with a supervisor, distinct from the commitment felt towards the organisation more generally (Clugston, Howell & Dorfman, 2000). This is because supportive treatment received from an individual supervisor is being attributed more generally to the organisation (Levinson, 1965; Rhoades & Eisenberger, 2001). Hence, performance and efforts to assist the organisation achieve its objectives may be mediated by high-quality relationships with
supervisors. This is important because knowledge sharing is a helping behaviour. As such, it is influenced by the worker’s willingness to assist the organisation, and that in turn is influenced by perceptions of a favourable relationship with the organisation.

POS effects are heightened when the employees perceive the organisation’s actions as discretionary rather than mandated (Hochwarter, Kacmar, Perrewe & Johnson, 2003), as this reinforces their belief in the individual focus of the actions. POS is positively related to procedural justice (Fasolo 1995) and mediates procedural justice’s relationship with organisational citizenship behaviours (Moorman, Blakely & Niehoff, 1998). Employees assess the organisation’s degree of commitment to them as individuals, such that POS is based on the unique work history of an employee over time and the employee’s desire to achieve balance in the relationship (Wayne, Shore & Liden, 1997).

An antecedent to perceived organisational support is perceived insider status (PIS), described as “the feelings of ‘insider’ status that may result from an employee-organization relationship” (Stamper & Masterson, 2002, p. 878). Perceived insider status is linked to and may influence workers’ perceptions of their psychological contract with the organisation. The PIS construct illuminates two key knowledge sharing issues: (a) access to organisational knowledge and knowledgeable others and (b) appreciation and integration of special expertise of ‘outsiders.’ The implications of these issues are now elaborated.

The first issue relates to the perception of a worker as being an ‘insider’ or ‘outsider.’ Perceptions of ‘insider’ status derive from roles or tasks considered central to the organisation or group (Pfeffer & Baron, 1988) and from social integration, and are positively related to altruism (willingness to act without expecting reward) (Stamper and Masterson, 2002), and helping behaviours (Katz & Kahn, 1966) such as cooperating, collaborating and knowledge
sharing. This is because they are both aspects of interpersonal behaviour arising from relationships with others. Insiders are more likely to share valuable information about ‘who knows what’ and to have increased access to knowledgeable others, through frequency of contact and serendipitous encounters (Borgatti & Cross, 2003). Consequently, ‘insiders’ are likely to be more frequent recipients of knowledge sharing from co-workers and broader organisational sources.

The term ‘outsider’ denotes workers who are less central to the organisation (sometimes described as marginalised). For instance, temporary, part-time and contract workers (Pfeffer & Baron, 1988) may be positioned as peripheral. However, ‘outsiders’ may include those lacking interaction with majority group members, also termed ‘social isolates’ (Argote, McEvily & Reagans, 2003). Common to both categories are feelings of not being an insider in the firm and a lack of social networks, irrespective of the number of hours worked or nature of the work carried out (Stamper & Masterson, 2002). Workers can also be marginalised when there are idiosyncratic customs or jargon (Weber & Camerer, 2003) which exclude those who are not ‘insiders’ and reduce participation in knowledge sharing practices.

Perceptions held by a worker of being an ‘outsider’ mediate against organisational citizenship behaviours and, hence, might have a negative relationship with knowledge sharing. Interestingly however, social isolates have been found to share their special expertise more frequently than socially integrated workers with special expertise (Thomas-Hunt et al., 2003). This may be because uncooperative behaviour can result in reduced reputation, which for marginalised individuals, may result in loss of employment (Argote, McEvily & Reagans, 2003) or alternatively, to enhance the basis of their employment. Hence, individuals’ standing and positioning also shape the basis of their knowledge sharing practice.
An individual worker’s special expertise often remains unknown to the larger group and, therefore, does not become institutionalised - evidence shows judgements are made based on the worker’s social connectedness and the nature of the expertise (Argote, McEvily & Reagans, 2003), which may not be considered relevant. The effect is amplified in the case of social isolates. However, diverse expertise within groups results in more creativity than groups with similar backgrounds (Williams & O’Reilly, 1998). Therefore, provision of induction and socialisation processes for employees newly joining a work group should include attention to social interaction and support. Use of ‘buddy’ systems, coaching and mentoring programs at all levels of employee appointment have been found to facilitate work and social connectedness (Merriam & Caffarella, 2006). Supervisors’ attention to the expertise of their staff and appropriate work projects, staff groupings and even physical co-location can facilitate the interactions which lead to increased knowledge sharing and innovation.

In summary, social integration and connections within groups and the organisation enable individual workers to access knowledge networks and knowledgeable others. Therefore, if workers are not connected to their group or the wider organisation they are less likely to be able to access organisational knowledge. Increased learning and more frequent opportunities for knowledge generation and sharing likely result from workers’ perceptions of (a) being supported, (b) experiencing fair and reasonable treatment, and (c) having a good relationship with their supervisor and colleagues such that they feel socially accepted and connected within the organisation. These are important for organisations which seek enhanced capability. Perceptions of low levels of organisational support may be accompanied by low levels of knowledge sharing. Further, the knowledge sharing orientation of contracted
employees should be more strongly influenced by their task-level interactions with other workers and their immediate supervisor than organisational-level factors.

*Psychological contracts*

Psychological contracts are defined by Rousseau (1989) as the employees’ perceptions of the mutual obligations existing between themselves and the organisation and are foundational to employees’ workplace attitudes and behaviours (Schein, 1980). Psychological contracts have been described as “a perceptual cognition defined at the level of the individual.” (De Vos, Buyens & Schalk, 2003, p. 539) and are based on social exchange theory (Blau, 1964). Transactional contracts should be distinguished from relational contracts (Morrison & Robinson 1997). Transactional contracts are focused on short term, limited scope interactions able to be valued financially. Relational contracts are broad, open-ended, incorporating loyalty and support. There are consequent differences in the levels of reciprocity, affective commitment, enacted positive discretionary behaviours and helpful orientations such as altruism (Morrison & Robinson 1997). For example, ‘time servers’ (i.e. those employees displaying mechanical, disengaged and disaffected approaches to their employment relationship) may perceive their contract with the organisation as transactional and limited to the specific scope of their job description and the tasks for which they are directly paid. They could be reluctant to go beyond the duties and aptitudes on which they will be appraised within the performance management process.

Both impersonal resources (eg information) and socio-emotional resources (eg valuing and respect) may be exchanged in accordance with the norm of reciprocity (Gouldner, 1960) during the course of the relationship between employer and employee. The relationship is
under most active formation and evaluation during the encounter stage of the initial socialisation process (Robbins, Millett, Waters-Marsh, 2004) and continues to evolve as a consequence of significant events or major changes in the subsequent course of the individual’s employment (De Vos, Buyens & Schalk, 2003). Since the relationship itself is valued, as well as the exchanges that take place (Robinson & Rousseau, 1994) the costs of reneging (i.e. potentially damaging or destroying the relationship) will be considered greater and will be less likely when the contract is viewed as relational (Morrison & Robinson, 1997). The relationship is strengthened by the employee’s history of favourable treatment by the organisation, their perceptions of the value of exchanges with the organisation, exchanges of increasingly important value and meaning to the parties, and perceptions of procedural justice. These aggregated perceptions result in increased in-role and extra-role behaviours (that is commitment levels and organisational citizenship behaviours) – typical precursors to knowledge sharing attitudes and behaviours.

Factors generally included in the psychological contract include employer and employee obligations relating to role characteristics (i.e. workload, role clarity and role conflict); job characteristics (i.e. autonomy, variety, importance and challenge); workgroup and socio-environmental characteristics (i.e. reciprocal fulfilment of obligations and transactional justice) (Coyle-Shapiro & Newman, 2004). Employees “pay attention to the statements and actions made by the company’s managers and senior executives, observe their colleagues and co-workers, and …note what produces benefit from the system in which they work.” (Rousseau & Greller, 1994, p.386) Hence, workers recognise and respond to Schein’s (1999) “theory in action” as they observe and experience the organisation, its management,
culture and environment, providing a context within which their decision making about knowledge sharing occurs on a daily basis.

The psychological contract is experienced and interpreted as constantly changing within the context of an employee’s work history. Organisations and their agents, in particular supervisors, would be well advised to pay attention to how the psychological contract is experienced, in particular to intrinsic factors which frame perceptions of organisational support. Perceptions of increasingly valuable exchanges and a supportive environment provide a setting for increased commitment and positive discretionary work behaviours - the foundation of collaborative and constructive knowledge sharing behaviour - and reductions in negative discretionary work behaviours. The experience of a psychological climate characterised by respect and consideration for workers and valuing of individual expertise, will assist the development of: (a) feelings of obligation to help the organisation achieve its goals, (b) increased above and in-role behaviours, and (c) active volunteering of personal ‘know-how.’ Conversely, a competitive undercurrent in an organisation can cause communication problems and block work productivity (Trice & Beyer, 1993). Therefore, increases in feelings of security, commitment and trust create workers’ confidence to willingly share hard-won personal knowledge.

The development of behaviours associated with employee cynicism may impact on a worker’s knowledge sharing orientation and practices. Employee cynicism is generally described as having three dimensions: (a) a breakdown in belief in the organisation’s integrity, (b) negative attitudes towards the organisation, and (c) increasingly negative behaviours towards the organisation, likely based on previous experiences in the organisation (Dean, Brandes & Dharwadkar 1998). Further, evidence suggests that cynicism seems particularly to
be related to organisational initiatives related to quality improvement and organisational change (Shapiro, 1996), issues frequently related to organisational knowledge generation and sharing. The extent to which employee cynicism is present in an organisation will govern its impact – nevertheless, the potential effect of negative employee behaviours arising from cynicism could impact on the valuing of knowledge, and participation in knowledge building and sharing activities.

In summary, individuals develop understandings and expectations about their relations with the organisation through their personally experienced work history, including their observations of others’ experiences. For instance, influences include transactional and relational issues such as favourable treatment, security, the value of exchanges within the organisation, perceptions of increasingly valuable exchanges and demonstrated procedural justice. These understandings and expectations create the conditions for positive psychological contracts and knowledge sharing. It could, therefore, be expected that where workers have perceptions of unfavourable psychological contracts there will be low levels of knowledge sharing.

Individuals’ perceptions arising from their understood and experienced psychological contract and level of organisational support probably constitute a powerful framework for attitude formation and decision-making about their behaviour. Knowledge sharing behaviours are the enactment of the intent to help the organisation achieve its goals, whether carried out at the macro, workgroup or individual level. In the following section, the constructs of reciprocity norms and organisational citizenship behaviour (OCB) will be elaborated. These constructs are important for knowledge sharing because they shape the behaviours resulting
from the worker’s assessment of their exchange with the organisation. OCB orientation could be expected to indicate a predisposition to knowledge sharing.

Knowledge Sharing, Reciprocity and Organisational Citizenship Behaviour

Reciprocity is concerned with the relational interaction, receipts and obligations of social relations in the workplace, and, hence, forms a backdrop to knowledge generation and sharing (Thompson & Heron, 2006). This is because a worker’s understanding of the nature of their relations with the organisation and their colleagues shapes their understanding of the reciprocal norms (Gouldner, 1960) operating in those relationships. In turn, this understanding creates the context for actions and interactions, and indicates the expectations and obligations for work practices, in-role and extra-role behaviour.

Relations are operationalised through commitment, trust, cooperation, and helping behaviours to provide relational or social capital (Willem & Scarborough, 2006). Relational capital develops over time and repeated interactions which provide a pattern and basis for expectations of future behaviour. However, this capital can be destroyed quickly (Leana & Rousseau, 2000; Leana & Van Buren, 1999). For instance, workers may negatively re-appraise their view of their relations with the organisation, supervisor or colleagues and alter their patterns of behaviour, if they observe or experience unfair or disrespectful treatment.

So, the contributions being received from the organisation or its representatives (for example, a supervisor, or more generally, management) and the nature of the worker’s own contributions, are evaluated in relation to expectations understood through the psychological contract (Rousseau, 2001) and the degree of affective commitment towards the organisation. In turn, this evaluation causes individuals to assess and (if considered necessary), alter the
level and nature of their contributions (De Vos, Buyens & Schalk, 2003). Relational factors such as reciprocity, therefore, have the potential to mediate workers’ contributions to knowledge sharing practices in organisations.

The development of rewarding reciprocal relationships based on sharing information and the development of trust within those relationships, impacts on the flow of knowledge to others outside the relationships. The principle of reciprocity can underlie manifestations of politically-based activities and impact on knowledge-sharing. Reciprocity has been described as pervading social life, for example, underpinning kinships, friendships, gift-giving, and economic exchanges (Di Norcia & Tigner, 2000).

Organisations depend on reciprocal obligations and mutual trust that others’ obligations will be fulfilled (Reich, 1993). It is through the extension of such relationships that Lave and Wenger’s (1991) ‘communities of practice’ develop, with additional political implications attendant upon the individual’s position within the community. For example, it is likely that judgements will be made by other community members about the value and frequency of reciprocal knowledge sharing interactions within the socially situated practice. Favourable or adverse judgements may influence members’ status, future collaborative opportunities and the nature of future interactions.

The cooperative behaviour of workers is not a general attribute, but rather, functions in relation to the target of the cooperation (Sanders & Schyns, 2006). For example, as noted above, a worker may be selective (a) in cooperating more with some colleagues than others, (e.g. due to interaction history, group membership or interpersonal relationships), (b) in cooperating with a supervisor, (e.g. because of their power and formal authority), and (c) at the organisational level, (e.g. to maintain job security or commitment to the organisation’s
goals). Similarly, cooperation and reciprocity between organisational units or entities are also mediated by relations (Dietz & Den Hartog, 2006). In sum, differential levels of cooperation and reciprocity may enhance or reduce knowledge sharing horizontally, vertically and diagonally.

The social context or social embeddedness of relationships influences reciprocity within organisations (Van Emmerik & Sanders, 2004). Raub & Weesie (2000) claim there are three dimensions to social embeddedness: (a) institutional embeddedness, (b) social network embeddedness and (c) temporal embeddedness. Institutional embeddedness refers to the organisational policy and procedures framework which state how interactions between workers, and workers and the organisation will proceed (North, 1990). In particular, work arrangements and human resource management processes illustrate reciprocal norms and influence workers’ views of their relationship with the organisation (Denise & Mishra, 1995) and the links between effort and reward. Social network embeddedness refers to the influence of the frequency and nature of social interactions with immediate colleagues and the larger organisation, which create relational history, reinforce norms and may provide rewards and sanctions (Granovetter, 1985). Social network embeddedness has multi-directional characteristics and informs beliefs about reciprocity expectations, contributions and outcomes.

The third dimension, temporal embeddedness, refers to both the history and the future expectations within the relationships, which have developed as a result of the relationship history and the investments which may have been made within the relationship over time (Raub & Weesie, 2000). The longer the relationship has continued to mutual satisfaction, the more likely it is that the parties have made mutually reinforcing investments, thereby stabilising the relationship and reducing opportunistic behaviour (Williams, 1996; Dietz &
Den Hartog, 2006). The temporal dimension, therefore, assists the individual in assessing the value of reciprocal exchanges and partnerships.

The implications for knowledge generation and sharing are three-fold: firstly, the individual worker’s relationship with the organisation is mediated by their understood and observed experience of the value of reciprocal exchanges with the organisation as a whole and those organisational units with which they interact. Thus the reciprocal exchanges at other levels will be reinforced by the norms of reciprocity experienced in the organisational relationship (Thompson & Heron, 2006). Secondly, the individual’s relationship with colleagues is mediated by the history and experience of reciprocal exchanges with their supervisor, group members and other co-workers. Perceptions of the value and rewards of exchanges with specific colleagues and groups will create beliefs about valuable others, and how exchanges are valued by their colleagues and groups of which they are a member. For example, it is likely a worker will continue to contribute if experience has shown that the work group values contributions. Additionally, the individual is able to identify those co-workers with whom reciprocal exchanges have been fruitful.

The third implication is the history of those interactions, which provides understanding of the outcomes of reciprocal exchanges. The outcomes demonstrate the value of mutual engagement activities such as knowledge sharing (Knorr Cetina, 1999; Lave & Wenger, 1991) and frame expectations and future orientations for action. In all, these understandings shape the worker’s interest in knowledge generation and their willingness to participate in knowledge sharing exchanges (Schulz, 2001).

The strength of personal relationships with peers and within workgroups may determine valuable experts’ organisational loyalty (Dess & Shaw, 2001), commitment and
knowledge sharing orientation. For example, in a setting where workers compete for individual client networks and organisational resources, it may be more advantageous for a worker to maintain tight control over their heuristic knowledge and to restrict colleagues’ access to their networks, except where some form of benefit will clearly result. Further, workers may elect to withhold their knowledge or restrict it to their closest circle (i.e. those with whom their ties are strongest) or distort information provided to outsiders, with negative implications for the organisation overall (Perry-Smith, 2006). Thus, reciprocity is important because it underpins the basis, perceptions and nature of cooperative and collaborative behaviour (Koster & Sanders, 2006), such as knowledge sharing.

Changes to the nature of employment relationships in recent times, accompanied by increased use of contracts and work outsourcing, mean that demonstrated reciprocity value may provide a worker with reasons to engage in knowledge sharing, where affective commitment and social capital have been undermined (Thompson & Heron, 2006). Perhaps the findings of Thompson and Heron, (2006), following Leana and Van Buren, (1999) and Nahapiet and Ghoshal (1998) in relation to length of service should be noted: evidence shows that relational capital is primarily developed through “strong and stable relationships based on high levels of mutual commitment and trust” (p. 43). Short term expediency, such as use of contract workers instead of maintaining permanent positions, may lead to lowered levels of relational capital, knowledge loss and reduced organisational outcomes. Use of contract workers can also lead to reduced productivity as experienced workers spend time providing training, resources and contextualised briefings to contracted staff and monitor their output. This consideration of contract workers is important because increasing outsourcing of work is occurring across both public and private sector organisations.
Organisational citizenship behaviour

In a work setting, knowledge sharing often occurs when one worker is informally helping another, that is, through providing assistance beyond their specific job requirements. Work behaviours are described as organisational citizenship behaviours when they go beyond the expected job performance requirements and contribute to future organisational success (Podsakoff & MacKenzie, 1997; Van Dyne, Graham & Dienesch, 1994). These behaviours have been described as essential for the development of social capital (Bolina et al., 2002).

Organisational Citizenship Behaviour (OCB) is defined as a worker’s discretionary extra role behaviour that is neither enforceable nor explicitly recognised by the organisation’s formal reward system, but which contributes to the organisation’s effective functioning and achievement of its goals (Organ, 1988).

Organisational citizenship behaviour is “related to commitment, fairness, leader supportiveness and conscientiousness” (Bommer, Miles & Grover, 2003, p. 181). It is essentially altruistic (that is, the willingness to act without expecting reward) and is an overarching orientation with direct connection to interest in knowledge generation and willingness to initiate and participate in knowledge sharing. Therefore, while norms of reciprocity have been argued to exist within a particular workplace relationship (Sanders & Schyn, 2006), OCB is more closely linked to an individual’s personal traits (Organ & Lingl, 1995), job attitudes (Van Dyne et al., 1994) affective states (George and Brief, 1992), interpersonal relations (Granovetter, 1973) and the social context (Ilies, Scott & Judge, 2006). It follows then, that OCB in the form of knowledge sharing practice derives from complexes of factors at the individual worker level.
Typical OCB includes helping, cooperating with others, volunteering constructive ideas, self-training (Podsakoff et al., 2000), civic virtue and conscientiousness (Lewis-McClear & Taylor 1998), together with loyalty, adherence to directions, policies and procedures, social and organisational participation. Interestingly, in the public sector, obedience and adherence to rules and norms have been found to be associated with individual public service motivation and notions of public service, rather than arising from a worker’s assessment of the psychological contract (Coyle-Shapiro, 2002). These factors indicate or predispose towards knowledge sharing behaviours.

Helping others is premised upon orientations such as altruism and peacemaking (Organ, 1988), interpersonal helping (Graham, 1989), and actively minimising difficulties for co-workers (Organ, 1988). As such, they are based upon the individual level personality traits of conscientiousness, dependability, reliability and discipline (Costa & McCrae, 1992). Agreeableness has been identified as underlying altruism, wherein high degrees of agreeableness predict altruistic behaviour such as OCB, and less agreeable individuals are less likely to demonstrate OCB (Rioux & Penner, 2001; Ilies, Judge & Scott, 2006). Therefore, altruism and trust could be described as underlying psychological orientations, while the extent to which an individual's self management skills are developed also plays a role.

Whether a worker engages in helping behaviours at a particular time and place has been found to be related to both the individual, the other parties and the situation (Ilies, Scott & Judge, 2006). At the individual level, OCB is enacted as a positive attitude. For example, actions such as not being offended when suggestions are not adopted by colleagues, not taking such rejections by co-workers in a personal sense (Podsakoff et al. 2000), volunteering creative and innovative ideas to improve task performance’ and undertaking extra-role
responsibilities could be considered as OCB. Other OCB behaviours include remaining loyal to and promoting the organisation even under adversity (Borman & Motowidlo, 1997), together with generalised and internalised organisational compliance.

Antecedents to OCB are task characteristics, organisational characteristics and leader behaviours (Organ, 1988; Podsakoff & MacKenzie 1995; Podsakoff et al., 1990). OCB directed towards helping the organisation achieve its objectives is influenced by both vertical (e.g. with a supervisor) and horizontal (e.g. with co-workers or group members) relationships, while cooperation is underpinned by reciprocity and differentiated by relationship direction and the behaviour of the other parties (Koster & Sanders, 2006). That is, general compliance is linked to the relationship with the supervisor, and altruism is related to solidarity with co-workers (Koster & Sanders, 2006).

Incorporating the perspective of affective events theory (Weiss & Cropanzano, 1996) helps to explain the fluctuations in OCB at work wherein engagement in OCB can vary based upon the individual and context. Fluctuations in OCB are related to the affective and attitudinal associations with certain events (Weiss & Cropanzano, 2006). For example, when individuals are in a positive mood they demonstrate (a) a more positive world view, (including towards co-workers), and so are more likely to engage in OCB (George & Brief, 1992); (b) increased creativity and innovative suggestions (Frederickson, 2001; Isen, Daubman & Nowicki, 1987); and (c) heightened empathy (Nezlek et al., 2001) making OCB more likely.

Individual workers with a positive disposition towards their work have been found to help their co-workers more (Ilies, Scott & Judge, 2006). Further, evidence shows that positive relations with a co-worker lead to more frequent OCB in relation to that co-worker (Lee & Allen, 2002). These events describe individual variations in worker OCB arising from
variations in affective states, which are themselves influenced by context and events (Mischel & Shoda, 1995). Hence, OCB can be described as sensitive to situation and relations rather than being a generalised state (Ilies, Judge & Scott, 2006).

In summary, the relational capital which develops over time between workers and their organisations is based on the history of obligations met, rewards for effort, and subsequent contributions. Relations between the organisation and co-workers create patterns of working and cooperating. Norms of reciprocity inform levels of cooperation and organisational citizenship behaviour. This is important, because OCB enhances general organisational performance: it assists development of the structural, cognitive and relational dimensions of social capital (Bolina, Turnley & Bloodgood, 2001). These dimensions in turn create a favourable environment and encourage participation in knowledge sharing.

Workers’ perceptions of being treated fairly colour their understanding of their relationship with the organisation, their work group and colleagues, and in turn their orientation for action. Organisational justice (i.e. perceptions of fairness in organisations) and its repercussions are central to workers’ beliefs about their relations with an organisation and their supervisors for knowledge generation and sharing practices. Concepts illuminating this construct are now examined.

Knowledge Sharing and Organisational Justice

Organisations have been described as socially contested settings. As such, they are characterised by some degree of conflict (Cropanzano et al., 1995). Organisational justice describes the worker’s beliefs about the fairness of the exchange relationship the worker has with their organisation, in terms of rewards and procedures (Hendrix et al., 1998). Beliefs
about organisational justice develop from the worker’s understanding of their psychological contract with the organisation, experience and observations of the nature of the work environment, organisational policies and processes, and the ways in which those policies and procedures are enacted. Drawing from equity theory (Adams, 1965), when workers identify an unfavourable imbalance in the relationship, they may: (a) reframe their beliefs about the required efforts and rewards, (b) alter their efforts or (c) leave the organisation (Cowherd & Levine, 1992). In this way workers are able to maintain their identity, rationalise their own actions and proceed on the basis of their decisions.

Negative experiences of organisational justice can re-shape the organisational environment and socio-emotional satisfaction and are negative indicators for knowledge sharing. Critical mediators include processes and outcomes associated with organisational and work-group decision making, inequities in employment conditions or rewards (Andrews & Kacmar, 2001), inequitable resource allocation (Greenberg, 1987) and the implementation of change. This is because the observation or experience of injustice causes individuals to re-evaluate their beliefs regarding the organisation and their feelings towards it. Subsequent reactions to negative re-evaluation of the organisation may include decreased trust (Tyler, Rasinski & McGraw, 1985), lowered performance (Cowherd & Levine, 1992), increased job dissatisfaction or withdrawal (Cohen-Charash & Spector, 2001) and lower incidences of helpful behaviours (Bies & Tripp, 1995; Cropanzano & Greenberg, 1997). Workers’ perceptions of organisational justice and the organisation’s motives for action cause workers to reconsider whether helping behaviours are warranted, rewarded and reciprocated (Nowakowski & Conlon, 2005), and therefore, are likely to influence knowledge generation and sharing.
Organisational justice is experienced by workers across four dimensions (Colquitt, 2001). First, the fairness of outcomes is evaluated in relation to application of standards or policies and referents such as colleagues or previous experience, and is denoted as distributive justice (Kabanoff, 1991; Leventhal, 1976). Second, the fairness of the process has been identified as procedural justice (Folger & Greenberg, 1985) and accounts for workers’ assessment of evidence of moral principles being applied, consistency with previous processes, evidence of bias, decision correctability and status recognition (Hubbell & Chory-Assad, 2005). For instance, a worker may be disappointed by the outcome of an application for promotion yet satisfied that the outcome is consistent with previous decisions they are aware of in relation to similar co-workers. This example also illustrates the assessments workers make about their treatment in relation to the treatment received by referent others, which forms part of their perceptions of organisational justice processes (Nirmala & Akhilesh, 2006).

Third, the treatment of people, described as interactional justice (Bies & Moag, 1986) is assessed in relation to the respect and courtesy with which workers are treated in organisational processes, for example, being personally advised of the outcome of their application for promotion. Finally, the truthfulness, timeliness and thoroughness of explanations provided for organisational actions, is identified as informational justice (Colquitt, 2001), for instance, being advised of the reasons for a successful or unsuccessful application for promotion and alternative career opportunities.

From the self-interest (instrumental) perspective, workers assess decision making and policies in regard to the impact on their own future, especially over the longer term, and review their commitment and helping orientation to the organisation accordingly (Greenberg,
1990; Shapiro, 1993). From the relational perspective, workers seek evidence that the organisation’s processes and procedures maintain personal dignity, sense of self worth and group status (Lind et al., 1993; Tyler & Degoe, 1995). Organisational justice perceptions are, therefore, a key predictor of organisational commitment, trust (McFarlin & Sweeny, 1992), perceptions of organisational support, helping behaviours, and likelihood of engaging in knowledge generation and sharing behaviour.

The implications of perceived organisational justice appear especially true in organisations which have experienced recent downsizing (Hopkins & Weathington, 2006). This is important because the organisation’s sustainability will depend on the reactions and subsequent actions of those who remain (‘survivors’) following downsizing (Brockner, Wiesenfeld & Martin, 1995). Survivors frequently experience higher workload, increased responsibilities, and changes in the nature of their duties following downsizing (Brockner, Wiesenfeld, Reed, Grover & Martin, 1993). For instance, survivors may experience changes to the nature of their work tasks, re-assignment to a different work group or even relocation. Survivors may exhibit increased cynicism, reduced organisational citizenship behaviours and affective commitment (Baruch & Hind, 2000; Spreitzer & Mishra, 1993). Studies have indicated a positive outcome where survivors are provided with adequate and timely post event information about the organisation’s changes, future plans and their own future role (Nirmala & Akhilesh, 2006; West, 2000). However, this is relational, in that it is based on previous experience that the organisation’s announcements and processes are honest and carried out (Hubbell & Chory-Assad, 2005), that is, workers’ aggregation of their experience of the organisation at an individual and group level.
The more satisfied workers are with the treatment they have received and the more trust they have that the organisation is concerned about them, the more likely it is that they will remain, display organisational citizenship behaviours, perform their role and tasks in a way that supports the organisation’s goals, and engage in helping behaviours such as knowledge sharing (Hopkins & Weathington, 2006; Meyer & Allen, 1991; Saunders & Thornhill, 2003). Employees, therefore, respond positively to perceptions that their organisation is concerned for fairness and respect in the processes, procedures, and communications which operationalise its treatment of employees. Higher levels of organisational satisfaction exist where employees feel that their organisation is concerned for them and their interests (Hopkins & Weathington, 2006). This perception informs workers’ understanding of their relationship with the organisation and colleagues and shapes their orientation towards engaging knowledge generation and sharing.

Trust in the organisation (organisational trust) and trust in the supervisor (managerial trust) have been shown to be separate variables linked to perceptions of organisational justice (Ellis & Shockley-Zalabak, 2001). Trust in the organisation is influenced by perceptions of procedural justice. This is because most procedures conform to the macro level organisational system; therefore, managers’ discretionary powers may be limited to the interpersonal-level implementation of those procedures (Ambrose & Schminke, 2003). Managerial trust, in turn, develops through interactions with a specific supervisor at the interpersonal level, encompassing communications, individual treatment and experienced respect, (that is, interactional and information justice) and is usually focused upon a relationship with one manager (Flaherty & Pappas, 2000; Hubbell & Chory-Assad, 2005).
In sum, the issue of fairness underlies a worker’s perceptions of organisational justice, and it has a powerful influence on the worker’s understanding of how they can expect the organisation and their supervisor to behave towards them. From these behaviours, workers draw conclusions about how they will be treated, including the nature of rewards and sanctions. Consequently, these conclusions provide the framework for their understanding of their relationship with the organisation, thereby shaping their orientation in regard to the performance of extra effort and helping behaviours such as knowledge generation and sharing.

Some work environments possess characteristics which support individual actions directed towards innovation and knowledge generation. These characteristics are essential for organisations to remain vibrant, generate new ideas and retain staff who can contribute to future growth. In the next section, these characteristics and their impact on knowledge generation and sharing will be elaborated.

Knowledge Sharing and Discretion to Question and Innovate

Innovation and knowledge generation have become increasingly important for organisations’ sustainability, as a source of competitive advantage and economic growth (Amabile, 1998; Collinson & Wilson, 2006; Connor & Prahalad, 1996; Turner and Makhija, 2006). Knowledge generation and sharing are fostered by an organisational environment which permits openness, variation, and freedom to question, which in turn encourages new ideas (Damanpour, 1991). Evidence shows that managers can establish a work environment which fosters innovation and change (Elenkov, Judge & Wright, 2005). For innovation, the positive influence of leaders is greater than the influence of organisational factors (Hage & Dewar, 1973). Further, managers with favourable attitudes toward innovation and
entrepreneurship are essential champions of innovation in the workplace (Damanpour & Schneider, 2006). Innovation frequently arises from the identification of anomalies in systems, processes and current practice (Katz, 1964; Kuhn, 1962). This means that in settings where workers experience opportunities to question and suggest improvements, generation of innovations and new knowledge is likely to prosper.

Positive expectations and support from supervisors (Scott & Bruce, 1994; Tierney & Farmer, 2002) and co-workers (Madjar, Oldham & Pratt, 2002), result in increased creativity and innovation. Workers exhibit higher rates of innovation in workplaces where supervisors reward and recognise workers’ creative attempts, (i.e. provide resourcing, encourage knowledge sharing and model innovative practice), and workers correctly interpret the supervisors’ expectations promoting creativity (Tierney & Farmer, 2004). Thus, workers’ perceptions of their work environment and understanding of supervisors’ expectations influence their generation of new insights and knowledge sharing activities.

The finite nature of working hours and supervisor pressure to meet deadlines and task requirements may create worker perceptions that the organisation’s focus is on instrumental rather than creative effort (Perry-Smith, 2006). For instance, social interaction has been shown to be part of the creative process (Amabile, 1983). This applies in relation to the immediate work group and, importantly, diverse others outside the worker’s usual connections who have related knowledge but provide more diverse perspectives (Cohen & Levinthal, 1990). For example, a worker may have irregular contact and discussions with colleagues in other parts of the organisation or outside the organisation, who possess some degree of relevant knowledge of the field or work tasks. Exposure to diverse but knowledgeable perspectives has been shown to enhance a worker’s knowledge base (Perry-Smith & Shalley, 2003) and
introduce them to different, unusual or unexpected knowledge connections. Awareness of
different connections may encourage reflection on practice, exploration of fresh idea
combinations, and the potential for new solutions (Simonton, 1999). Distribution of new ideas
and knowledge sharing is likely facilitated by social interactions with both close and more
dispersed colleagues (Perry-Smith & Shalley, 2003). However, the organisation’s formal
structure may impede socialising with workers from other areas or functions, limiting the
possibility of interaction, reinforcing conformity, and reducing individual autonomy for
experimentation (Granovetter, 1973, Amabile, 1996).

Further, where the pressure of work is intense, time taken for reflection and socialising
with colleagues may be seen as unproductive and actively discouraged (Amabile, 1998). The
pressure of external performance requirements may also reduce the necessary intrinsic
motivation and curiosity (Amabile, 1983) and time available for idea generation and problem
solving (Mumford, 2000). For example, organisational change, downsizing and reorganisation
have been found to disrupt innovation (Dougherty & Bowman, 1995). Creative problem-
solving and innovation require workers characterised by tolerance of ambiguity, interest in
learning, strong achievement motivation, flexibility (Barron & Harrington, 1981; Brophy,
1998) and capable of high levels of integration (Gruber, 1989, 1996). In organisations where
innovation, knowledge generation and knowledge sharing are desired, a work environment
which allows time to reflect, safeguards innovation projects and provides access to internal
and external information resources, has a positive relationship with innovation (Gick & Lock
hart, 1995) and the needs of workers (Mumford, 2000).

Organisational settings whose work environment is perceived by members to value
initiative and psychological safety foster employees’ feelings of “able to show and employ
oneself without fear of negative consequences to self image, status or career” (Kahn, 1990, p. 708). A psychologically safe climate has been associated with higher performance and more frequent volunteering of new ideas by workers (West, 1990). Outcomes linked to higher performance from a psychologically safe climate, have been identified by Baer and Frese (2003) as including: lessened risk in volunteering new ideas (Edmondson, 1999; West, 1990), improved team learning (Edmondson, 1999) deeper job involvement and effort (Brown & Leigh, 1996) and collaborative problem-solving (Baer & Frese, 2003). So, a psychologically safe climate is likely to foster creative efforts to improve processes and procedures and learning behaviour (Baer & Frese, 2003). This is because an element of risk may be present in the experimentation and innovation required for process improvement and innovation (Perry-Smith, 2006).

Individual workers feel more secure if the organisation has demonstrated willingness to accept errors, incremental innovation and more radical innovation without penalty, especially if development is time-consuming (Mobley, Doares & Mumford, 1992). Knowledge generation may also result from a worker’s use of individual initiative to produce improvement or innovation (Tailby & Turnbull, 1987). As noted, use of personal initiative is fostered and motivated by a psychologically safe climate in which a degree of autonomy and the ability to behave proactively to achieve optimum task performance are provided (Baer & Frese, 2003). In turn, autonomy has been found to foster interest in acquiring and using knowledge (Wall et al., 1992). Autonomy also supports psychological growth (Thompson & Heron, 2006) through identification of new connections and increased frequency and creativity of connections between what is known and what is new, together with higher effectiveness in ambiguous situations (Herzberg, 1968), facilitating innovativeness.
Innovation results from combining different knowledge and experience and requires diversity of opinion (Nahapiet & Ghoshal, 1998). Diversity of opinion also requires a psychologically safe climate to flourish, because innovation may require challenge to accepted conventions, conventions which may be associated with long standing or high status individuals. There may be tensions between changing and remaining the same (Lave and Wenger, 1991). Overly formalistic processes and procedures “can de-legitimise individual discretion,” privileging procedures over workers’ judgement (Cropanzano & Byrne, 2001, p. 35; Sitkin & Bies, 1993). Workers with deeper expertise and higher levels of education in a field have been found better able to absorb new knowledge in the field (Daghfous, 2004). Yet, the sense of identity arising from membership may cause workers to embrace, resist, alter or subvert changes to accepted practice, and in a situation where the change is perceived to be incongruent with the locally, socially constructed values, reject the change (Breu & Hemingway, 2002).

A strong sense of occupational identity has been found to create a sense of being removed from the wider organisation, thereby creating the potential for reduced affective commitment and collaboration (Alvesson, 2000; Baumard, 1999; Brown & Duguid, 2001). Additionally, closed working groups create pressure for conformity (Leonard & Sensiper, 1998; Starbuck & Milliken, 1998) which can lead to the rejection of new ideas or different ways.

Therefore, strong pressures for conformity can act as an impediment to knowledge generation and the distribution and integration of the new knowledge. This has two important implications. First, where organisations plan to make large scale change, they need to account for the potential for both positive and negative influences on worker receptiveness to these
changes. Second, within workgroups or sites of practice, there may be pressure on members (particularly, novices or new members), to conform to conventions, practices, or idiosyncratic routines which may mediate against any knowledge generation or innovation which would challenge those conventions.

Routines are defined by Feldman (2000) as ‘a capability for repeated performance that has been learned by an organisation in a context of selective pressures’ (p. 612). They form a base for an organisation or group’s knowledge over time and, hence, provide a powerful source of organisational knowledge. Routines can include the actions and processes which workers carry out in their normal work activities drawing on the organisation or group’s structure or knowledge (Collinson & Wilson, 2006; Nelson & Winter, 1982). Routines have been found to be both a significant source of inertia and resistance to change (Ashforth & Fried, 1988) and a source for innovation and stability (Feldman & Pentland, 2003). This is because they are the means by which “organisations remember their capabilities” (Arrow, 1962). Organisational knowledge includes the “mechanisms of interaction” (Collinson & Wilson, 2006, p. 1365) (i.e. relational frameworks for communication, knowledge generation and knowledge sharing, together with organising structures for the integration of action). So, routines can shape workers’ understanding of what can be questioned and what is non-contestable. Consequently, routines can create a capacity for knowledge generation, or for inertia which acts as a barrier (Zander & Kogut, 1995). A change of management or leadership may unlock routines and act as a stimulus for change or a different use of current resources, including skills and knowledge (Collinson & Wilson, 2006).

In this section, the importance for knowledge generation and sharing of a work environment in which there is freedom for workers to question, use their initiative, modify and
innovate has been elaborated. In particular, where supervisors model innovative practice, provide clear expectations for innovation and provide resources to support knowledge generation, development and sharing of innovations may be higher. Further, the characteristics of workers and groups can be expected to influence knowledge generation sharing where inertia and pressure to conform to conventional practices prevent review of routines, diverse social and information sharing interactions and a safe psychological climate for the presentation of new ideas.

Conclusion

This dissertation proposes that knowledge sharing is mediated by the relations between organisations and their workers and the relations among those workers. Understanding of knowledge generation and sharing practices and behaviours, requires accounting for and understanding of the specific contexts of organisation members’ activities and social practices, and the organisation’s activities and social practices. Together, these factors constitute bases to understand the relations between workers and their workplaces, and in particular, advance understanding about the generation and sharing of knowledge that is required to sustain effective organisational work.

The development of knowledge as a socially-based activity (incorporating relationships among problem-solving, goal-directed activity, learning, and a social context (e.g. the organisational or professional setting) within which these activities occur), is acknowledged in social learning theory and management theory (Anderson, 1993; Billett, 1998; Chi et al., 1981; Rogoff, 1990; Schwarz, 1998). Despite this, much remains to be done to develop a more substantive body of theory (Miner & Mezias, 1996; Snyder & Cummings,
1998; Tsang, 1997), and further research recording both successes and failures in the implementation of knowledge generation approaches (Easterby-Smith, 1997) is required. To date, management theory draws heavily from individual organisation “success stories” (Easterby-Smith, 1997). Teece (1998, p. 289) suggests that the “already significant literatures on the management of technology, entrepreneurship, innovation, and business strategy” be developed and extended, and suggests integrating knowledge gained from those fields, with insights available from accounting, economics, organisational behaviour, marketing, sociology, and strategy. Miner and Mezias (1996) propose that “learning offers an image of management that is more realistic than traditional planning and control models” and moves toward a more integrative view of “organisations as systems” (Miner & Mezias, 1996, pp. 97, 98). Daft and Lewin (1993) highlight the need to build theory by studying new organisational forms.

Members of organisations do not act independently of the organisation: i.e. its structure, ongoing relationships, and actions. The ability to understand, negotiate, synthesise, and appropriately respond to the task context demands more than individual cognition in the development and sharing of knowledge. Indeed, Weick and Roberts (1993) suggest that “intelligence is to be found in patterns of behaviour rather than in individual knowledge” (p.359). These concepts are important in understanding the shift from traditional views of individual learning and knowing, derived from and viewed through the lens of cognitive learning theory (Cook & Brown, 1999).

Knowledge generation and sharing occur at all levels, individual, group and organisation-wide, are irrevocably interpretive, sense making, distributive, and are embedded in all organisational activities. This dissertation argues that knowledge sharing is central to
organisations’ sustainability but dependent on workers’ understanding of their relations with the larger organisation and their colleagues. It addresses Huber’s (1991) criticism of the lack of cross-fertilisation between research perspectives and Easterby-Smith’s (1997) recommended exploration of the cultural and sociological perspectives. It is also congruent with Vince’s (2001) valuing of a framework for understanding organisational learning that integrates politics and organisational level dynamics, which he describes as “least well-theorized and thought-through in practice.”(p. 1344)

The dissertation attempts to identify helpful views and contributions from the bodies of literature exploring management, organisational behaviour and social learning theory. In doing so it develops new insights to inform future practice relating to knowledge sharing at both the individual and organisational level. It identifies complex sets of interrelated factors that facilitate or discourage knowledge building for enhanced organisational capability. These sets of factors are the key to understanding and developing sustainability in organisations.

In Chapter Two, major issues influencing the relations between organisations and knowledge sharing were identified as: (a) the generation of knowledge, (b) the contested nature of the process of knowledge construction, (c) the impact of the individual worker’s experience of the organisation’s internal environment on shaping their knowledge sharing orientation, (d) how the organisation is understood to value knowledge sharing, (e) the impact of relations with colleagues on knowledge sharing behaviours, and (f) the perceived outcomes of knowledge sharing behaviour.

In Chapter Two, the factors in the external and internal macro organisational context depicted in Figure 2 were explored and their links to knowledge sharing practices and behaviours were established. Issues underpinning knowledge generation and sharing were
outlined. Two key conceptual approaches (i.e. social learning theory and management theory) were introduced to establish a conceptual basis for the context of the research proposition. Firstly, social learning theory provides insights based on understanding of the socially situated nature of knowledge generation and sharing, through socially and locally constructed practice sites and artifacts. Management theory provides insights based on a view of knowledge generation and sharing as essential for an organisation’s increased capacity for learning and hence sustainability. Contributions from the organisational behaviour literature have been examined to provide insights regarding in the impact of the organisational setting on workers’ relations with the organisation. In sum, workers are understood to generate, use and share knowledge in accordance with their interpretation and negotiation of meaning from their organisational setting.

The influence of organisational structures was elaborated, (e.g. the organising principles, control systems, networks and power relations) to further understanding of how these frame the structure, coordination and communication of individual and functional expertise, and patterns of cooperation at the macro-level.

Specific issues important for knowledge sharing that have been identified as arising from external and internal environmental complexity are now depicted in Figure 2.

<table>
<thead>
<tr>
<th>Environmental Complexity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating environment, e.g. economic, political, public sector influences</td>
</tr>
<tr>
<td>Industry, e.g. special nature of the industry and sector</td>
</tr>
<tr>
<td>Organisation’s values, orientation, practices, structure and control mechanisms, constraints</td>
</tr>
<tr>
<td>Drivers for change</td>
</tr>
<tr>
<td>Impact of the work nature and demands</td>
</tr>
</tbody>
</table>

*Figure 2* Factors comprising the macro-level environment for knowledge generation and sharing.
Figure 2 depicts the complexes of factors in the external and internal environments which have been identified to shape workers’ knowledge generation and sharing orientations and practice. Specifically, as shown in Figure 2: (a) the operating environment, (b) nature of the industry and sector, (c) organisation’s internal characteristics and environment, (d) drivers for change and (e) the impact of the work nature and demands provide the context and guiding information for orientations, behaviours, and relations with co-workers necessary for task accomplishment. The demands of the macro-level context create requirements, expectations, and tensions that influence workers’ constructions of values, practices and behaviours that are considered to contribute to the organisation’s capabilities. These constructions, in turn, form orientations to actions that will facilitate knowledge generation and sharing.

Factors identified in the present chapter as important for knowledge sharing at the local, socially situated sites of practice are now depicted in Figure 3.

<table>
<thead>
<tr>
<th>Socially Situated Practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Contested workplace relations among workers</td>
</tr>
<tr>
<td>• Climate for knowledge generation and sharing</td>
</tr>
<tr>
<td>• Construction of knowledge and development of expertise</td>
</tr>
<tr>
<td>• Profession framework, e.g. values, practices</td>
</tr>
<tr>
<td>• Value attributed to knowledge and expertise</td>
</tr>
<tr>
<td>• Contributors to knowledge leakage, e.g. local practices and actions</td>
</tr>
</tbody>
</table>

Figure 3 Locally constructed values and practices providing the framework for action on a day-to-day basis in the work setting

As depicted in Figure 3, the roles played by political activities such as norms and beliefs, group memberships, and internally constructed barriers to knowledge generation and sharing were examined to discuss their influence on workers’ generation and knowledge sharing practices. These provide an introduction to the organisational dynamics within which workers’ experience of the organisational behaviour setting on a situated day-to-day basis for task accomplishment. So, the values and practices depicted in Figure 3 arise from the context
of locally situated, socially constructed practice sites. These values and practices guide workers’ interpretations and sense-making in regard to their local practice setting and, hence, shape how knowledge sharing practices and behaviours are enacted in each setting.

Social constructions of meaning and relationships create complex sets of factors which inform workers’ perceptions and beliefs about what is and is not valued, and, in turn, their decision-making regarding knowledge generation and sharing with their co-workers. Processes through which workers negotiate roles and relationships in their local sites of practice and among other co-workers were elaborated to explain the influence of contested workplace relations for knowledge sharing. Constructs framing workers’ interpretations of personal and observed experiences of the organisation, their supervision and their co-workers were explored to identify mediators for an organisation’s climate for knowledge generation and sharing, and the value attributed to knowledge and expertise. Training processes through which novices and newcomers acquire contextualised knowledge for task execution have been established as important for knowledge development, progression within the local practice site and role negotiations with colleagues. Finally, as presented in Figure 3, indicators for knowledge leakage have been explored to identify local practices and actions which may impede organisational sustainability and competitiveness.

In this chapter, issues and concepts specifically related to understanding knowledge generation and knowledge sharing have been explored. The research issues and concepts introduced in Chapters One and Two, were elaborated and applied to the context of the individual worker in the organisational setting, and these are depicted in Figure 4.

In particular, micro level factors influencing the development of the individual’s relationship with the organisation and their knowledge sharing orientation were identified as:
(a) the individual worker’s affective organisation commitment, (b) trust levels between individuals, groups and between the individual and supervisor; (c) feelings of security; (including feeling valued personally and for specific expertise), role clarity and linkages; (d) rewards for job involvement and extra-role behaviour; (e) the experienced reciprocity of effort and reward; (f) experienced organisational justice; and (g) discretion to question, innovate and improve.

**Micro-Level Mediators**

- Individual worker’s orientations and characteristics
- Affective organisational commitment, e.g. trust between worker and organisation and its representatives
- Relational history with co-workers, e.g. interactional history and trust among workers
- Extent of organisational citizenship behaviours
- Perceptions of organisational justice and feelings of security

---

*Figure 4* Micro level factors mediating individual knowledge generation and sharing.

As presented in Figure 4, it is proposed that these factors mediate the development of the individual’s relationship with the organisation and their knowledge sharing orientation. The factors are described as micro level because they exist and are influential at the level of individual workers, their interactions with the organisation, its representatives, and their colleagues. Hence, these micro level factors provide a lens through which individual workers view the outcomes of their interactions and actions, and mediate workers’ decisions about future behaviour.

In this chapter, the first section concluded that where positive affective commitment is present in a worker’s relationship with their organisation and workgroup norms encourage, recognise and value knowledge sharing behaviours, knowledge sharing could be expected to
be more common and to be performed for the good of the organisation. It further concluded that successful knowledge sharing in public service organisations will be underpinned by collaborative partnerships between managers, professionals and service clients.

The second section highlighted the central role of trust in a workers’ relationship with their organisation and hence in facilitating participation in knowledge generation and sharing. Additionally, it highlighted the role of trust in facilitating relations between co-workers, collaboration, open communication, and reciprocal knowledge exchanges.

The third section identifies the impact of personally experienced treatment, valuable exchanges of effort and reward on the development of positive psychological contracts and perceptions of being valued were identified. These perceptions shape the worker’s understanding of their relationship with the organisation and contribute to their knowledge generation and sharing orientation.

Following that, the links between knowledge sharing practices and organisational citizenship behaviour, experienced reciprocity and organisational justice were examined. The contributions to our understanding are three-fold. First, the norms of reciprocity experienced in exchanges at the organisational level will create the context and reciprocal norms enacted in relationships at other levels. Second, perceptions about the value and rewards with specific colleagues and groups will create beliefs about valuable others, and understanding of how exchanges are valued by co-workers and work groups. Third, the interaction history demonstrates the outcomes and value of mutual engagement activities such as knowledge sharing. In addition, the conclusions that provide workers with information about how they can expect the organisation and management to behave towards them, consequently inform their decision making in regard to extra role behaviours such as knowledge sharing.
Finally, the implications for knowledge generation and sharing that arise from an environment which provides discretion to question and innovate were proposed. Knowledge generation requires diversity of opinion and discretion to experiment with new ways. In turn, these require a psychologically safe climate, freedom from excessive work pressure, time for reflection and creativity, and interactions with diverse colleagues inside and outside the work group and the organisation. Without such resourcing, lower levels of knowledge generation and sharing will diminish the organisation’s unique competitive edge and hence its sustainability. In the following chapter, the method and procedures selected to investigate these propositions are discussed.
The purpose of the practical investigations reported in this dissertation is to identify
the influence on knowledge generation and sharing practices of relations between
organisations and their workers and the relations among co-workers. This dissertation draws
upon the theory and research of sociocultural learning and management theory to propose a
coherent view of organisational knowledge generation and sharing. It aims to identify and
integrate the most useful perspectives from both fields to inform future practice.
Consequently, the method proposed here aims to identify interrelated complexes of factors
that both inhibit and facilitate the generation and sharing of knowledge within organisations.

In Chapter Two, factors in the macro organisational context influencing the relations
between workers and their organisation and, hence, knowledge sharing practices were
elaborated. In Chapter Three, micro-level influences were proposed that shape individual
workers’ understanding of their relationships with the organisation and their colleagues, and
subsequent individual knowledge sharing orientation and behaviour.

A review of research orientations and procedures provides insights into methods and
procedures that are congruent with the aims of this dissertation. Previous research has
investigated: the management of intellectual capital (Stewart, 1997; Sveiby, 1997);
organisational memory (Cohen & Bacdayan 1994; Feldman & Feldman, 2006); and attempts
to convert individual tacit knowledge to knowledge that is explicit and organisational (Nonaka
& Takeuchi, 1995). Related research includes the key role of the collective mind (Weick &
Roberts, 1993) in the relationship between individual knowledge and organisational learning (March & Olsen, 1976, Argyris & Schon, 1978, Sims & Gioia, 1986; Simon, 1991; Sitkin, 1992). Additionally, the complexity of interplays between individuals’ social knowledge, organising principles of work and ‘social’ knowledge has been explored by Kogut and Zander (1996) and Spender (1996a, 1996b). These studies suggest how enquiry into knowledge generation and sharing should best proceed through illuminating the complexity, but irreducibility, of the relationships between individual knowledge, group knowledge, and the organisational context within which they are situated.

As this dissertation seeks to explain occurrences in social systems, the research aims must be investigated at both macro-level and micro-levels (Robson, 2002). As noted above, in the preceding chapters, influencing factors at both macro and micro-levels have been advanced. Hence, a research design, procedures, and data analysis method that can support investigation at both micro and macro-levels and allow inferences to be drawn in relation to the proposal that knowledge generation and sharing are mediated by the relations among organisations, their workers and amongst those workers. Levels of knowledge within an organisation’s knowledge system have been proposed as interrelated and at (a) individual, (b) group, (c) department, (d) division, and (e) corporate levels (Roos & von Krogh, 1992). It follows then, that an investigation into organisational learning and knowledge generation should address these issues at individual, group and organisation levels, involve multiple populations, and a longitudinal relationship (Miner & Mezias, 1996).

The dissertation correspondingly embraces an approach capable of: (a) exploring multiple contexts, (b) multiple perceptions and behaviours, (c) individual and larger group influences and outcomes and the links between those, and (d) generating data that would best
meet the goals of the dissertation. This is because “the hierarchically nested nature of organisations” (Schneider, Brent Smith & Sipe 2000, p.105) requires examination of relationships at different levels of analysis in order to develop understanding. So, the reciprocity between individuals and the systems in which they function in an organisational setting (Schneider, Brent-Smith & Sipe, 2000), is best explored through research and analysis at a range of organisational and experienced levels.

Multilevel research and analysis can identify the linkages between individual, group and organisational behaviour, and the linkages of effects to different aspects of theory and data (Schneider, Brent Smith & Sipe, 2000). For instance, emergent processes can be pursued, such as the identification and analysis of emergent processes such as the development of knowledge through personal activities, and the subsequent application, sharing, and adoption across groups within the organisation (a “bottom up” process). Similarly, the development by management of an organisational climate and specific strategies can foster, recognise and reward learning and knowledge (a “top down” process). To this end, the research aims to capture data across levels and groups within the organisational setting to provide depth and scope to the evidence and its interpretation (Yin, 1994).

A key methodological issue is the location of the enquiry and characteristics of the participants. In order to illustrate and support an embedded, interpretative study of complex social practices, this research required a location and setting which allow examination of the theoretical frameworks which have been proposed. Therefore, the investigation needs to inform about knowledge generation and sharing relations and practices across groups, levels, departments, occupations and multiple individuals in an organisational setting.
This chapter is structured as follows. First, the study’s orientation is discussed to elaborate the framework for its purpose and approach. Second, the research design and method is described and justified in relation to the dissertation’s purpose and context, in order to establish the rationale for the research method and techniques. Quality measures specifically incorporated in the research design are described and justified. Following this, the detail of the operationalisation of the research procedures and data collection are discussed and justified, in order to demonstrate their appropriateness to provide data which illustrates and supports the purpose of the enquiry. In the subsequent section, the data analysis procedures are elaborated as a foundation for the presentation of results in subsequent chapters. Limitations and threats to the research design are then listed.

In sum, the research procedures for the collection of data and the processes for the analysis of the data are now described and justified, to provide a comprehensive and coherent account of the research method and procedures adopted for this dissertation. The dissertation’s orientation is discussed first.

Orientation to Enquiry

The approach to this dissertation can be described as searching for “understanding” of a range of behaviours. Two levels of enquiry are required to understand an organisation’s capacity to effectively use its knowledge. First, understanding is sought, of the influence of a range of factors present in the organisation’s operational and interpersonal environment which mediate the individual worker’s perception of their relationship with the organisation. This requires the collection of specific data about the organisation. Specifically, individual participants’ elaboration of their perceptions of their relationship context at work are required,
for instance, their responses to certain aspects of the organisation’s practices. These accounts will facilitate a process of analysis and interpretation, to aid understanding. Second, understanding is sought, of the influence of a range of factors present in the history and interactions of interpersonal relations among co-workers in organisations. To this end, additional data illuminates the individual worker’s beliefs about their relationship with the organisation and their co-workers, the reciprocal obligations and expectations involved, accounts of their knowledge generation and sharing experiences and their own knowledge sharing behaviours.

A qualitative approach has been adopted, because it allows the researcher to accept “the multiple realities and socially constructed meanings that exist” within social contexts (Burns, 1994, p. 12). Qualitative approaches attempt to provide a holistic view of the situations or organizations under investigation (Cassell & Symon 1994; Patton 1980). They aim to permit the richness, multiple levels of meaning, and subjective nature of the research setting to be understood. So, a qualitative approach is congruent with the aims of this enquiry and facilitates openness to unexpected data or unplanned events (Patton, 1990).

Openness to unexpected or emerging data is important for this investigation as it is concerned with relations, perceptions and behaviour (Eisenhardt, 1989). Research which explores interactions, i.e. “the space between” (Bradbury & Bergmann Lichtenstein, 2000, p. 551) must be sensitive to unexpected or unusual nuances in order to capture the most salient data. Quantitative studies, on the other hand, identify sets of variables in order to determine their relationship (Glesne & Peshkin, 1992), and use sampling reliant upon numbers and predetermined response categories that will support the use of statistical techniques (Patton, 1994).
The key goal for the investigation is to understand the contextual and interpersonal characteristics of the research setting so that the social practices can then be understood (Hartley, 1994). So, the complexity and interrelatedness of those characteristics which influence the shaping of orientations to knowledge generation and sharing and the knowledge generation and sharing practices, must be delineated for understanding to be achieved (Lankshear et al. 1997). Qualitative methods are appropriate for this goal as they typically produce a wealth of detailed, anecdotal and descriptive information (Halliday, 2002). Further, experiential data are held to be strong and to form a sound basis for research propositions and validation (Longino, 1993).

Characteristics of qualitative research relevant to this dissertation include: (a) its ‘focus on interpretation rather than quantification, (b) flexibility in the process of conducting research, and (c) a concern with context – for example, “regarding behaviour and situation as inextricably linked in forming experience” (Cassell & Symon, 1994, p. 7). Its concern with the generation or expansion of theory (Miles & Huberman, 1994) is consistent with the aims of the dissertation, because the purpose and impact of the current study is largely explanatory (Marshall & Rossman, 1995). That is, it seeks explanation and patterns of a phenomenon. While Kaplan (1964) notes that explanations may be inconclusive and limited to specific contexts, they potentially stimulate further research (Patton, 1990).

Qualitative research frequently results in an extremely large amount of data, making preparation of a coherent, informed written analysis challenging (Wolcott, 1994). The amount of data and a lack of rigour can lead to suppression of contrary evidence or the exclusive use of supporting data extracts (Silverman, 1993). Here, evidence which supports the research proposition and contrary evidence are presented to provide a holistic and integrative body of
data. Adherence to the research focus and key issues guide the data collection design, analysis and interpretation, to ensure that important data is collected, spontaneous data collection opportunities are analysed for usefulness, and use of the data collected is strategic (Denzin & Lincoln, 2005; Miles & Huberman, 1994).

In determining the research methodology, the goal is to achieve a rigorous, theory-driven design using data gathering and analysis techniques derived from and employing theory driven techniques (Hartley, 1994). Important issues have been identified in the literature, and data is required which will tightly link the dissertation and its outcomes to the underpinning theory (Eisenhardt, 1989). In sum, the research purpose focuses on relational and behavioural themes, and participants’ underlying beliefs. Fundamental to achieving the enquiry’s purpose are personal explorations of social situations and interactions in the workplace that lead to the development of shaping orientations to behaviour.

An enquiry approach is described as constructionist, interpretive or descriptive when it focuses upon the ways in which people view events or objects, and the meanings they construct around those events and objects (Denzin & Lincoln, 2005). This approach focuses on the individual, personal and contextualised nature of meaning construction arising from a respondent’s experienced reality over time and repeated interactions. As such it is eminently consistent with the purpose of the present research. A constructionist approach expects multiple versions of events as a consequence of the differing perspectives which arise from the respondents’ individual histories (Rubin & Rubin, 2005). The research approach acknowledges, however, that not all participants may share all experiences (Bryant, 2006). This is important in a multilevel enquiry in an organisational context such as the current dissertation, which aims to gather information across groups, levels and departments where it
is likely that participants’ experiences will vary (Kozlowski & Klein, 2000). Hence, an investigative process which promotes elaboration of meaning through multiple interactions with multiple respondents will be fruitful in eliciting individual perspectives.

This investigation also seeks to identify shared meanings, expectations, judgements and orientations held locally by respondents (Gubrium & Holstein, 1997). It is hermeneutical in the sense that meaning is sought in participants’ stories of events and experiences (Bryant, 2006). In keeping with its constructivist premise, syntheses of understandings and beliefs about events and issues are sought through a process of eliciting and combining individual accounts.

In this way, meanings and perspectives held at the group level can be established. At the same time, attention is paid to preserving contrary and unique renderings of events and issues (Guba & Lincoln, 1998; Rubin & Rubin, 2005). For instance, in an organisational work setting, where a group member has different work history, positional power, or significantly different length of service, their orientation to action and beliefs about an organisation may differ from those of other group members. Consequently, while certain perspectives may be held in common with the group, alternative views may be held about other issues and events which provide important illumination. The independence and integrity of such views may best inform the investigation by separate interpretation and reporting, thus ensuring no constructions are excluded unfairly (Lincoln & Guba, 2003).

In summary, the need for additional research exploring links between individual and organisational learning from different perspectives has been identified (Tsang 1997). Additional research is required into the ways organisations can carry out, within the situated practices of ordinary daily work, knowledge generation and sharing practices that underpin
use of knowledge in new, innovative, and more productive ways, essential to ongoing innovation and sustainability (Cook & Brown, 1999). The data collection should be systematic and the research design should be rigorous, aimed at providing a framework for cohesive theorising rather than a compartmentalised, narrow approach (Tsang, 1997).

The enquiry’s orientation has been described here and linked to relevant theoretical constructs. The adoption of a qualitative approach has been justified as being the most purposeful. Central to the investigation are the research procedures, and these are described and justified in the following sections to demonstrate the explicit framework provided by the research proposition in guiding the research method, data collection, analysis and interpretation.

Research Method

Case study

In a qualitative study, the researcher needs sufficient involvement with the research setting and participants to gather data holistically and aggregately on participants’ actions, reactions and activities (Burns, 1994). In this way, the ability to follow up new, emerging, or altered situations and information specifically related to the research questions is maximised. The research procedures, therefore, require data collection methods which provide the opportunity to collect data in depth and in context, and the case method is recommended for this purpose (Amposonem, 1991).

The case study method is appropriate where the research site is a “bounded system,” that is, where the group of people being studied is a discrete unit whose members identify with each other and which is extremely atypical or representative of the research issues and their context (Burns, 1994; Miles & Huberman, 1994). This is because it is useful where
contemporary, real life events are being investigated, where the researcher has no control over those events, and where investigative questions are the basis of the dissertation (Hartley, 1994). Case study is a research strategy that incorporates detailed investigation of a phenomenon in one or more organisations or groups within organisations, to produce analysis and interpretation of the phenomenon in relation to its context (Denzin & Lincoln, 1998; Yin, 1981).

A case study may provide anecdotal evidence, which illustrates, challenges, or extends generalised findings or beliefs. Moreover, case studies can allow the researcher to capture the “holistic and meaningful characteristics of real-life events” (Yin, 1994, p. 3) over the complete time, maturation, process, or life cycle of the object of research, rather than being used to capture “phenomena.” Case studies can provide insights into the particular type of event from which the case has been drawn (Burns, 1994, p. 314). Additionally, case studies allow insights into other events related to the particular event being studied and hence the capture of its uniqueness (Patton, 1990).

Case studies gain strength from using multiple sources or methods, e.g. systematic interviewing with multiple respondents, to gather anecdotal evidence (Yin, 1994). Survey strategies and the analysis of archival records are adequate when the research goal is to “describe the incidence or prevalence of a phenomenon, or … to be predictive about certain outcomes” (Yin, 1994, p. 6). However, where explanatory research questions need to be answered, a case study is appropriate. Rowley (2002) suggests that the depth and scope of detail accompanying each case should be extensive in comparison to a survey approach, as surveys usually study a larger number of units. The objective is a systematic comparison and
exploration of the research issues, to extend the information available and the potential for theory building.

Case study steps

Conduct of a case study procedure usually follows four steps (Yin, 1994; Burns, 1994). The first step requires the substance of the research question (e.g. what is being studied?) and the form (e.g. what type of question is being asked?) to be clarified and stated. The second step involves clarifying the scope of the research question, that is, what issues within the question will be examined and hence what data are relevant? These questions must be derived from an understanding of the literature, as the research itself needs to be located within the theoretical framework. Hence, prior to the commencement of field work, a thorough and wide-ranging review of relevant and recent literature has been undertaken and synthesised in Chapters Two and Three, to elaborate and justify the purpose and scope of this dissertation. The research question, broad at first, has been systematically reviewed in light of the literature reviewed and the findings of relevant research and theory development.

This refining process has been essential to allow the investigation to be proposed to respondents. However, the need to be sensitive to emerging data during the progress of the case and openness to further refinement of the research proposition has been maintained (Hartley, 1994). The research issues and their relationship to the underpinning theoretical constructs are summarised in Table 1. This table presents a synthesis of the macro and micro-level factors and instances of the literature than supports them. In the left column, the macro and micro-level factors are identified in turn. In the right column, the relevant literature is listed respectively.
<table>
<thead>
<tr>
<th>Research issues</th>
<th>Links to literature</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Macro-level</strong></td>
<td></td>
</tr>
<tr>
<td>Knowledge sharing</td>
<td>Borgatti &amp; Cross (2003); Deniz &amp; Zarraga-Oberty (2004); Lorenz (2001); Schulz (2001); Stasser et al. (2000); Thompson &amp; Heron (2006)</td>
</tr>
<tr>
<td>Contested nature of knowledge construction and sharing</td>
<td>Beech et al. (2002); Engstrom (1993); Gherardi &amp; Nicolini (2000); Richter (1998); Valsiner (1998); Van deVen &amp; Johnson (2006)</td>
</tr>
<tr>
<td>How the organisation values knowledge sharing</td>
<td>Bock et al. (2005); Lawrence et al. (2005); Orlikowski (2002); Osterlund &amp; Carlile (2005)</td>
</tr>
<tr>
<td>Impact of relations with colleagues on knowledge sharing</td>
<td>Dess &amp; Shaw (2001); Dirks &amp; Perrin (2001); Haynes (2005); Koster &amp; Sanders (2006); Maeneil (2003); Menon &amp; Pfeffer (2003); Thomas-Hunt et al. (2003)</td>
</tr>
<tr>
<td>Outcomes of knowledge sharing</td>
<td>Bresnen et al. (2003); Goh (2002); Wasko &amp; Faraj (2005); Wittenbaum (2000)</td>
</tr>
<tr>
<td><strong>Micro-level</strong></td>
<td></td>
</tr>
<tr>
<td>Worker’s affective commitment</td>
<td>Adler &amp; Kwon (2002); Boyne (2002); Clugston, Howell &amp; Dorfman (2000); Dess &amp; Shaw (2001); Jarvenpaa &amp; Staples (2001); Kim (2005); Lawrence et al. (2005); Marshall &amp; Rollinson (2004); Perry &amp; Wise (1990); Wayne, Shore &amp; Liden (1997)</td>
</tr>
<tr>
<td>Trust levels among workers and between workers and their supervisors</td>
<td>Cameron (2004); Chowdhury (2005); Drogege &amp; Anderson (2003); Flaherty &amp; Pappas (2000); Tagliaventi &amp; Mattarelli (2006)</td>
</tr>
<tr>
<td>Feelings of security and being valued</td>
<td>Aselage &amp; Eisenberger (2003); Brown &amp; Leigh (1996); ); Kahn (1990); Orr, Sackett &amp; Mercer (1989)</td>
</tr>
<tr>
<td>Rewards for job involvement</td>
<td>Borman &amp; Motowidlo (1997); Fuller et al. (2006); Ilies, Scott &amp; Judge (2006)</td>
</tr>
<tr>
<td>Experienced reciprocity</td>
<td>Dietz &amp; Den Hartog (2006); Koster &amp; Sanders (2006); Rousseau (2001); Sanders &amp; Schyns (2006); Thompson &amp; Heron (2006)</td>
</tr>
<tr>
<td>Discretion to question, innovate and improve</td>
<td>Baer &amp; Frese (2003); Mobley, Doares &amp; Mumford (1992); Thompson &amp; Heron (2006)</td>
</tr>
</tbody>
</table>

What this table suggests is that consistent with the concepts discussed in Chapters Two and Three, an investigation is required at more than one level. Firstly, there are macro-level organisational context influences which mediate relations between workers and their organisation and the subsequent knowledge generation and sharing practices and micro-levels.
Additionally, there are socially situated micro-level influences on individual workers’ understanding of their relationships with the organisation and their co-workers which shape their individual knowledge sharing orientation and behaviour.

Thus, elements of the macro-level influences are issues associated with the knowledge generation process and knowledge sharing, the contested nature of knowledge construction and sharing, the worker’s experience of the organisation’s internal environment, how the organisation values knowledge sharing, the impact of relations with colleagues on knowledge sharing, and finally, the outcomes of sharing knowledge. Components of the micro-level influences are issues associated with the worker’s affective commitment, trust levels among workers and between workers and their supervisors, workers’ feelings of security and being valued, perceived rewards for job involvement, experienced or observed reciprocity and organisational justice, and finally, workers’ experienced or observed discretion to question, innovate and improve.

The third step of the case study procedure (Yin, 1994; Burns, 1994) involves defining what the unit of analysis really is, the context of the case, and the persons to be included. The strategy for selecting study participants may evolve as data is collected, and indications of themes or criteria to be followed up become evident (Glesne & Peshkin, 1992). The strategy of participant selection hinges on the multi-layer research needed to illustrate, interpret and comprehend the issue, coupled with the researcher’s own judgements (Glesne & Peshkin, 1992; Klein & Kozlowski, 2000). Theoretically, selection of cases should be based on their ability to produce similar results (literal replication) or conflicting results convergent with the proposition, i.e. theoretical replication (Rowley, 2002).
The fourth and final step comprises the data collection and analysis stages, and addresses the necessity to link the data to the theoretical propositions and the criteria for interpreting the findings. Working with the data as it is collected allows the researcher to organise it, search for patterns, seek explanations, establish links with other data, interpret and reflect, ensuring this design issue is addressed and explored through the perspective of the literature review and the purpose of the study (Holliday, 2002). During data collection and analysis, testing for bias is valuable: for example, being open to contrary findings. The possibility of bias can be reduced if contrary findings have clearly been sought, and rebutted through evidence produced (Yin, 1994).

Within the overall framework of the case study method, specific information gathering procedures and data analysis strategies have been identified as deemed appropriate. The investigation procedures and strategies adopted for this investigation will now be described and justified.

Investigation Techniques

*Individual interviews*

The main data collection method comprises individual interviews with multiple respondents. The purpose of the investigation is to gather data which provides evidence to support the proposition that knowledge sharing is mediated by the relations between organisations and their workers and the relations between those workers. Individual interviews are an especially appropriate investigation technique, because the research focuses on relationships and processes within a social unit (Robson, 2002). Collecting evidence from multiple sources provides triangulation to corroborate the findings (Rowley, 2002).
Individual interviews provide the opportunity to seek explanations from the participants about their opinions, perceptions, and attitudes concerning the issues under study, the reasons for their behaviour, and potential future behaviour (Glesne & Peshkin, 1992). Interviews are flexible and can result in data of depth and scope to illuminate the research issues, especially when a series of interviews is carried out over time in the research setting (King, 1994). Barent (1966) suggests that for respondents, the opportunity to put their views forward under conditions of anonymity is empowering. Where trust can be built up over repeated interviews, rapport improves the data quality and facilitates unique, individual interpretations which may conform with or challenge conventional accounts of events (Webb, 1995).

The qualitative researcher’s task is “to provide a framework within which people can respond in a way that represents accurately and thoroughly their points of view about the world, or that part of the world about which they are talking” (Patton, 1990, p. 24). It is within the privacy of the individual interview that the researcher can create opportunities for respondents to specifically reveal their ideas, perceptions and views. By using questions such as (a) “Tell me about your work, (b) “Tell me about a time when knowledge sharing worked well,” and (c) “Tell me about a time when knowledge sharing did not work well” the researcher is able to gain descriptions of events which are personal perceptions incorporating attitudes, values, beliefs about how events unfolded, who influenced the course of those events in what ways, and the respondent’s reactions to the unfolding events and actions (Holloway & Jefferson, 2000). Individual interviews provide essential opportunities for gathering direct quotations which can reveal the role of participant and others in events which
are important to the enquiry. Therefore, the respondent’s perspective in relation to the research issues and the derivation of that perspective can be explored (Marshall & Rossman, 1995).

The interviewer needs to be sensitive to and aware of nonverbal messages, interpersonal interactions, and evidence of participant discomfort or unease (Patton, 1990). This is because the interviewer’s task is more than recording and processing responses, as maximum results will be gained from participation in a genuine conversation with the respondent (Miniciello et al., 1995). The process can be likened to “a critical inner dialogue” (Adelman, 1981, p. 24). The most effective qualitative interviews result from: (a) researchers’ participation through responding, commenting, probing for clarification or expansion, (b) allowing comfortable silences while the respondent gathers their thoughts, and (c) simultaneous critical analysis by the researcher of the data being presented (Miniciello et al. 1995).

**Semi-structured interviews**

A semi-structured interview using a list of discussion topics central to the research focus has been selected as the preferred method. This affords opportunities to establish some comparability of participant responses on the key issues, and to investigate spontaneously any associated topics that develop during the interview (Burns, 1994). Since the identified topics guide the agenda, the semi-structured interview is closer to the unstructured interview that the structured interview model. The social interaction between interviewer and respondent provides freedom for interviewer judgement about the questioning process (Miniciello et al., 1995).
Although in some instances fixed wording and question order are not necessary, as the research has a particular purpose, a pre-determined interview schedule of open-ended questions allows exploration of key issues either identified in the literature or of particular importance in the case study organisation. It also ensures that the research issues are addressed within the interviews over time and across respondents. The development of questions in the present study arises from examination of the relevant literature: for instance, it adopts aspects of Fleck’s (1992) categorisation of management knowledge (Brown & Woodland 1999; Roos & von Krogh, 1991). Semi-structured interviews also allow for modification of the question order or wording in accord with the researcher’s critical judgement, for reasons associated with the respondent, content duplication, or the opportunity or need to expand the data collection (Robson, 2002).

To provide sufficient depth, the data collection process incorporates a series of three interviews with each participant arranged at mutually convenient times, over an interval incorporating a minimum of twelve months between the first and final interviews. The objective of this scheme is to provide for the collection of data over time and allow the interview focus to shift to more personal individual levels through an ongoing collaboration (Webb, 1995). Thus, more descriptive and non-contentious topics relating to the organisation’s purpose and the nature of the respondent’s work tasks can be placed within the initial interview or introductory phase. Questions probing for personal opinions and reactions to events can be introduced later when the respondent has developed a degree of ease with the research purpose, researcher and the process.

The question design should maximise use of open questions due to their flexibility and capability to produce complete responses, in addition to their potential to result in
unanticipated data (King, 1994, Kvale, 1996; Robson, 2002). However, closed questions can be useful to gain specific responses on some issues and to change focus. A key strategy incorporated in the design of the interview questions is the use of stories to elicit direct observations and personal perspectives through requesting examples of situations and actions. The purpose is to reduce distorted responses and to increase the quality and scope of the data. The issue under investigation concerns influences on knowledge generation and sharing behaviours. Some influences will not be ascertained through direct questions. They are more likely to be revealed though stories of interactions and events. The use of stories or narratives will be elaborated in the next section to establish the rationale for its inclusion.

Use of Narratives

Stories are a powerful research instrument to gain access to deeper organisational realities as they are experienced by members (Czarniawska, 1997; Feldman, 1990; Gabriel, 1998; Martin, Feldman, Hatch & Sitkins, 1983). Stories can reflect employee interpretations of co-workers, organisational beliefs and history (Pacanowsky & O’Donnell-Trujillo, 1983). They provide a shortcut for new members to learn about an organization’s culture (Martin, 1982). Gitlow et al., (1990) report that stories support the presentation and interpretation of process improvement studies for management. Polkinghorne (1988) notes that narrative is “the primary form by which human experience is made meaningful…it organises human experiences into temporally meaningful episodes” (p. 14). Stories facilitate the identification of barriers and facilitative factors, and hence, how conflicts are resolved. In the course of stories, people who behave as barriers or facilitators in organisations emerge (Hansen & Kahnweiler, 1993), thereby revealing clashes of different interests (Deal & Kennedy, 1982;
Martin, 1982) and the challenging, avoidance or subversion of management power (Trice & Beyer, 1984; Gabriel, 1998).

Using narratives for organisational research is based upon collection of stories to examine and compare individual accounts about the same occurrences. The power of narratives, then, lies in the revelation of not only the individuals’ beliefs and perceptions about pertinent events, but also the organisational politics, values and culture in action. O’Connor (2000) notes that consistent with theories of human memory (Halbwachs, 1950), in organisational stories the organisational past is used as a resource to address present and future (anticipated) dilemmas, thereby acting as memory banks for important ideas and strategies (Wilkins & Martin, 1979).

Seeking stories which reveal and explain incidents of past and current success as well as examples of the lack of success, provides fertile ground for the identification of strategies and behaviours which facilitate or impede successful knowledge creation and sharing. In addition, where the same story is independently told by a number of respondents, deeper insights may be gained into not only the incidents being described, but into the organisation itself (O’Connor, 2000). Such occurrences indicate group or organisational significance, i.e. ‘sacred’ stories’ (Eliade, 1975).

Narratives should not be equated with facts, as they represent accounts of events and phenomena. However, “they enrich, enhance and infuse facts with meaning but may themselves be infused with lack of consistency and ambiguity, reducing their trustworthiness” (Gabriel, 1998, p. 136). The limitations of using storytelling are derived from their strengths. They present facts within a framework of perceptions, beliefs, emotions, and in relation to the specific context and actors in the actual incident, (which may or may not be typical of those
factors) (Hansen & Kahnweiler, 1993). Stories may contain illogicalities (Gabriel, 1998). Elaboration and exaggeration may be presented as a factual representation (Czarniawska, 1998). The veracity of the storyteller may be enhanced through the ‘halo effect’ and the researcher may knowingly or unknowingly select stories which coincide with their own beliefs about the research issue, introducing researcher bias (King, 1994). However, Czarniawska (1998, p. 16) notes that “organizational narratives are the main mode of knowing and communicating in organizations.” Indeed, she suggests that stories are the primary mechanism for learning in organisations through their widespread circulation among organisational members (Czarniawska, 1998). For instance, a competitive undercurrent in an organisation can cause communication problems and block work productivity – a manifestation of power relations impacting on organisational knowledge creation and sharing, which may be surfaced through story telling but not appear through other, less personal research methods (Trice & Beyer, 1993).

In sum, questions designed to elicit stories revealing such behaviours forms an appropriate and essential research tool directly related to the specific issues under investigation. Further, the “indexical statements” found in narratives (Bauer 1996, p. 3) facilitate analysis. This is important, as the amount of data which results from a significant number of interviews can be overwhelming at the data analysis stage. Subsequently, the task of identifying and interpreting themes which illustrate the theoretical purpose may be a difficult one (Miles & Huberman, 1994).
Disadvantages associated with individual interviews include: (a) their costly nature (in time taken, cost and transcription), (b) the researcher’s verbal and non-verbal influence on responses, (c) researcher bias and subjectivity, and (d) lack of observability in the process (Hannabuss, 1996; Stokes & Bergin, 2006). For instance, researchers need to pay rigorous attention to their demeanour (e.g. facial expressions or tone of voice) during the conduct of the interviews. Attention is required, for instance, in follow up probes used for clarification or expansion, as these can become directional (Taylor & Bogdan, 1998). Consensus can be masked by the sequential nature of the data collection and amount of data collected, in turn delaying analysis and detection of the consensus (Greenbaum, 1998). In addition, to minimise respondent misrepresentation, conducting more than one interview over time is a strategy aimed at reducing respondent attempts to give a ‘correct’ and potentially uncharacteristic answer, although some measure of this problem is likely (Rubin & Rubin, 2005). Therefore, ongoing review and overview of data throughout the data collection phase is required.

In the sections above, the selection of data collection approaches and techniques has been described and justified in relation to the purpose of this study to demonstrate that the investigation procedures and techniques have been determined by the guiding framework, i.e. the research proposition. The data analysis approach will now be presented and the rationale elaborated to establish its appropriateness.

Approach to Data Analysis

The goal for the data analysis is to draw from the evidence its information and the story it tells, in order to arrive at meaningful and persuasive analytic conclusions which
eliminate alternative interpretations (Yin, 1994). While this goal appears simple and uncomplicated for any researcher, the nature of qualitative research frequently produces large quantities of data, capable of being categorised and interpreted in a variety of ways. These may not maintain the integrity of the original form or meaning, or truly relate to the original research questions. The aim of the data analysis stage, therefore, is to maximise the usefulness of the data while protecting its comprehensiveness, specificity and validity (Flanagan, 1954).

The data analysis process can be summarised into three steps: (a) data reduction, (b) data display, and (c) conclusion drawing and verification (Miles & Huberman, 1994). Data reduction occurs continuously throughout the study, from initial decisions about what to research and how, through data collection and its description, through to the writing of the final report. Data reduction is both analysis and condensation. Data display enhances the analysis process by organising information into accessible, compact forms (including tables, matrices, graphs etc), which assist the researcher’s ability to draw conclusions to carry out additional analysis. The third step, conclusion drawing and verification, occurs informally throughout the study, becoming clear and “final” at the conclusion of the study when the validity of the meaning drawn from the data has been “tested’ and verified. This process is, therefore, iterative and cyclical, rather than rigidly sequential.

Qualitative data analysis uses the complete body of data to identify the most important aspects of the case in the informed view of the researcher, and should explore rival interpretations on key issues (Rowley, 2002). This framework is operationalised through the clear, direct links between the issues identified in the body of literature and the research design and procedures in this investigation.
In the data reduction activities, the process should unfold as follows: (a) recognition (identifying key phrases, patterns, issues, key differences, common sequences) and isolating patterns therein; (b) summarising, coding, isolating themes and grouping clusters (Miles & Huberman, 1994); (c) clarifying and synthesising: elaborating generalisations relating to the consistencies discerned in the database (Rubin & Rubin, 2005) and (d) applying the theoretical framework to those generalisations (Robson, 2002). The aim here is to secure richness in the depth and scope of data relevant to the research issues and the theoretical framework. The purpose in gaining a range of descriptions on the key issues (“multiple mappings”) is not to judge respondents’ differing versions for veracity, but to enhance understanding of the situated work that they do (Silverman, 1985). A cyclical process moving between the stages above allows analysis which shows that respondents’ stories are not idiosyncratic and disconnected, but include underlying themes, issues and consistencies. Hence, as the evidence builds, there are also connections in a temporal sense (Miles & Huberman, 1994).

The review of relevant literature identified the focus for the investigation. From these, a priori constructs can be identified (Eisenhardt, 1989) to assist the development and focus of the interview schedule of questions. These should be tentative constructs, given the possibility that during the course of the data collection the research proposition could assume a different focus, or unforseen issues could emerge. Care must be taken however, to avoid predicting relationships between a priori constructs. As noted previously, the intention is that the research design is flexible, allowing modifications to be made as needed during the study in response to new and emerging data or contra-indications to the original research question (Miniciello et al., 1995).
Development of a priori constructs provides a starting point for the development of codes related to key concepts and themes. In dealing with the text arising from interviews, level one coding should be carried out to allow segments of text to be labelled and retrieved. Level two or pattern coding then clusters the original codes into groups or themes for review and exploration (Miles & Huberman, 1994), as sub-categories. For instance, data might be grouped under level two codes or sub-categories, such as descriptions of a particular event or behaviour. Similarly, level two codes or sub-categories could designate an aspect of the organisation such as its structure or culture. An additional source of level two codes or sub-categories may be concepts or themes frequently mentioned by respondents, for instance, problems experienced in dealing with an aspect of the workplace or job tasks (Holliday, 2002). Consistent application of the codes will facilitate analysis and interpretation: definition and delineation of codes will take place as they are applied to the evidence and some re-definition is likely to reflect use of the concept by interviewees.

Searching for patterns across data codes can be facilitated by using categories or attributes (e.g. age, occupation and status) as described above. So, searching across codes and categories can result in information comparing attitudes among status groups towards an event or perceptions of an organisational issue (Denzin & Lincoln, 2005). Evidence can be extracted regarding the nature and influences upon knowledge generation and sharing within an organisational setting from management and non-management workers’ views.

Reporting data which build an integrated picture of the issues at the heart of this enquiry, the social setting, respondents, relationships and behaviours will provide ‘thick description’ (Geertz, 1993) allowing holistic interpretation of the evidence. The immediate and wider social context frames beliefs, antecedents to behaviour, relations among co-workers
and practices. Providing detail of these demonstrates the connections and interactions and permits a more complete view of the sociocultural environment. Including sufficient data as ‘thick’ description will illuminate these factors to provide richer and more accurate interpretation (Holliday, 2002).

In summary, the research design is derived from the literature relating to the issues under study in this investigation. The research orientation, strategy, data gathering techniques and data analysis approach have been selected for their relevance and theoretically based appropriateness for investigating the research proposition. The research design has been framed according to the principles of good qualitative research design, chosen because the research proposition seeks understanding of beliefs and practices in a contextualised social setting. The specified qualitative research principles have now been elaborated. In the following section, measures considered in ensuring the quality of the research design will be discussed, prior to the detailed description of the operational research procedures.

Research Design Quality Measures

Establishing trustworthiness in qualitative research requires attention to criteria established by a range of sources and perspectives. The constructs of validity and reliability are associated with research soundness, however, qualitative research is especially concerned with trustworthiness (Lincoln, 2002).

Historically, the case study approach identifies measures of construct validity, external validity and reliability as important for trustworthiness (Yin, 1994). Three key criteria are proposed by Eisenhardt (1989), namely: (a) the strength of the method and evidence of its thorough basis in theory and the research proposition, (b) the theory should emerge at the end
rather than at the beginning of the research and demonstrate parsimony, testability and coherence, and (c) the emergent theory should provide new insights to the field. Lincoln and Guba (1985) recommend measures of credibility/plausibility, transferability/context embeddedness, dependability/stability, and confirmability or reliance on data, as appropriate for qualitative research design (p. 329). Four criteria are proposed by Cepeda and Martin (2005) for establishing soundness in case study research, after assessing a range of case studies against the measures advanced by Eisenhardt (1989) and Lincoln and Guba (1985). Cepeda and Martin (2005) propose evaluation of internal validity through use of a series of research evaluation questions, in addition, to construct validity, external validity and reliability (p. 855), and to integrate the measures, as shown in Table 2.

Table 2

<table>
<thead>
<tr>
<th>Quality measures</th>
<th>Design tests in positivist case</th>
<th>Evaluation questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Validity</td>
<td>Construct validity</td>
<td>Are the study’s general methods and procedures described explicitly and in detail? Do we feel that we have a complete picture, including “backstage information”? Are study data retained and available for re-analysis by others? How rich and meaningful or “thick” are the descriptions? Are the findings internally coherent? Are concepts systematically related?</td>
</tr>
<tr>
<td>Internal validity</td>
<td></td>
<td>Do the findings include enough “thick descriptions” for readers to assess the potential transferability appropriateness for their own settings? Are the findings congruent with, connected to, or confirmatory of prior theory?</td>
</tr>
<tr>
<td>External validity</td>
<td></td>
<td>Are the research questions clear and are the features of the study design congruent with them? Have things been done with reasonable care?</td>
</tr>
<tr>
<td>Reliability</td>
<td>Reliability</td>
<td></td>
</tr>
</tbody>
</table>

(Adapted from Cepeda and Martin, 2005, p. 855)

Examination of these evaluation questions shows that they contain design, process and outcome issues. Design issues include questions associated with the clarity of the research
proposition and the relationship of the research design to the central proposition (reliability). Process issues include complete description of the general methods, procedures and background information (i.e. construct validity), and the careful conduct of the enquiry (i.e. reliability). Similarly, use of ‘thick descriptions’ (i.e. internal validity) is a process issue. Outcome issues include the sufficiency of the descriptions for transferability and congruence of the findings with prior theory (i.e. external validity), coherence and relationships established among the findings (i.e. internal validity) and retention of the data for secondary analysis (i.e. construct validity).

In the present investigation, design issues have been addressed in preceding chapters and the sections above, (e.g. the origin of the research question has been carefully described and clear links between the research question and the methodological approach have been explicated). Process issues have been addressed throughout the following section, which provides a detailed description of the research procedures, setting and conduct of the investigation, thereby creating an audit trail (Lincoln & Guba, 1985). Outcome issues will be dealt with in the subsequent chapters detailing the interpretation, findings, integration and completion of this study.

To further enhance trustworthiness, three principles advanced by Klein and Myers (1999) are incorporated. The principle of dialogical reasoning suggests sensitivity to incongruence between the guiding theoretical framework and the actual findings, potentially requiring revision. Secondly, the principle of multiple interpretations may apply where retelling of the same event by multiple respondents demonstrates multiple perspectives and beliefs about the event. The third principle is described by Klein and Myer (1999) is the
principle of suspicion, requiring examination of respondents’ accounts for biases and group level distortions.

Peer review and support was ensured through regular debriefings and discussion of both procedures and data, to assist identification of emerging themes. Member checking (Robson, 2002) was undertaken on conclusion of the third round of interviews with experienced workers, in the form of an oral debriefing with a senior manager in the selected organisation (agreed during negotiations for access to the organisation). The senior manager was asked for his assessment of the initial interpretation as a means of checking for researcher bias.

In sum, careful account is taken of the requirements for trustworthiness and soundness of the coherence of the design and its theoretical framework, the execution of the research design, the data analysis, interpretation and conclusion development and the sufficiency of the procedures therein to establish the bona fides of the study’s outcomes. In addition, specific limitations (presented later in the chapter), and remedial actions undertaken to address the threats they pose to the study will be discussed. In the following sections the operationalisation of the research procedures will be specified.

Practical Research Procedures

When conducting a qualitative research study: (a) the researcher must gain personal understanding of the situation and people; (b) the research procedures must create sufficient contact to ensure capture of both events and accounts of events; (c) the depth of description must be captured, (e.g. of people, their actions and interactions, and the contexts); and (d) direct quotations from respondents must be included (Lofland, 1971).
In this section, the steps taken to apply this framework through a set of procedures will be specified. The following steps make up the phases of the data collection: (a) negotiating entry to the research site; (b) determining participants; (c) conduct of data collection techniques, specifically, individual interviews and examination of relevant documentation; (e) data analysis (Robson, 2002). A detailed account of each phase now follows to demonstrate the execution of the research design in support of the research proposition. Following that, the limitations and threats to the investigation will be discussed.

**Negotiating entry to the research site**

To illustrate and support an embedded, interpretative study of complex social practices, the study sought a location and setting which allow examination of the theoretical frameworks which have been proposed. An organisational context was sought which supported enquiry across individual, group and organisational levels (Miner & Mezias, 1996). Given the research proposition, a research setting with the following characteristics was desirable. Firstly, the setting should be of sufficient size, stability and complexity that multiple respondents could be engaged in the research process over time, the respondents should be derived from more than one grouping, and more than one level (for instance, non-management and management) should be represented. Secondly, it was desired that the occupations of respondents should be drawn from professionally-based backgrounds, in keeping with Alvesson’s (2004) view that the professional sector is underrepresented in knowledge generation and sharing research. To this end, access was negotiated into a large public sector organisation which provides transportation infrastructure, identified hereafter as TransportServices.
The organisation

TransportServices has been in existence for 150 years. Its core business is provision of freight and passenger infrastructure over short and long haul distances, integrating road and rail. It has an outstanding safety record. It also provides industry-specific expert consulting services, logistics services, freight and passenger services, and access to its infrastructure networks to external parties (for example, other transport operators) by contractual agreements. It currently provides services in three other countries, in the past having provided contracted services in additional countries. In the last forty years, it has become the largest national freight hauler, operating a widely dispersed national network. It has become especially expert in heavy coal railway haulage over long distances and a wide range of terrain. TransportServices’ statement of values addresses external and internal performance and customer focused principles, and specifically describes corporate social responsibility, innovation and service delivery for sustainability, and safety. It is a government owned corporation in the public sector. Staff number approximately 14,000. A key resource is its vast infrastructure network and its ability to design, build, maintain and upgrade the infrastructure to support its evolving business strategy in a changing competitive environment.

The business environment of TransportServices has altered dramatically in the past 15 years with the introduction of a national competition policy. Management at that time decided to expand from a state-based operation to become a competitive, commercially driven provider of services across the country. The chief executive officer throughout the duration of the investigation (with over 30 years’ service in TransportServices) has focused on the development of a market driven operation with key focus areas of market expansion and
safety during his tenure. In its public sector environment, TransportServices is subject to parliamentary, public and media scrutiny. It comes under ministerial control and direction from two government ministers: the ministers responsible for (a) transport and (b) the treasury, together with a large number of legislative and regulatory frameworks. In turn, it interacts with local, regional, state, national and international government and corporate bodies, as well as the public, in the execution of its activities. Historically it has conducted those activities with a low profile, service provider approach. The quiet, ordered working environment encountered in the research setting during the data collection phase appeared to reflect this approach.

A likely departmental grouping comprising professional and paraprofessional knowledge workers, specifically, civil engineers and design drafters, was identified. Introductions were arranged to the key stakeholders (Burgoyne, 1994). Serendipitously, the investigation was of interest to TransportServices as a significant number of the identified group have long service histories (more than half the experienced workers in the sample have in excess of 20 years’ service), highly developed expertise and organisational knowledge, and have entered a stage where retirement is an option (see Appendix 1: Participants’ attributes). Key stakeholders were the general manager of the overall function who gave approval for the project to proceed and the senior manager of the two functional groups from which participants were drawn. The agreement and support of the line management were essential for the project’s commencement and progress (Burgoyne, 1994). Subsequently, the senior manager personally initiated the project’s arrangements and participated as a respondent. Detailed agreement relating to scope, access, limitations and provision of future feedback and reports was negotiated.
During the preparation phase, organisation documents were sought to obtain background on the size of the organisation, number and organising arrangements of employees. A book describing the history of the organisation was provided to the researcher from its library, together with access to TransportServices’ regular internal newsletter which contains policy, personnel changes and other announcements. Organisational charts were obtained at the commencement and conclusion of the study, although a major restructuring of the area and changes in personnel during the course of the study means that the two sets of charts are not directly comparable. Public information was viewed, including data available through websites, annual reports, press releases, newspaper articles, and marketing materials. During the course of the interviews held in organisation facilities, historical photographs and various internal organisational posters, announcements, policies and operational notices were on display. Such documents provided evidence of organisational systems, policies, procedures and cultural artifacts, enriching the background information available to the researcher (Yin, 1994).

In all, the organisational documentation provided broad information about the organisational and organising context. Their scope and depth are insufficient to be classified as a separate data collection technique, as they do not specifically inform the focus of the enquiry, but rather, function to assist the researcher’s understanding of the organisational setting. Familiarisation with the organisation’s current business position took place as part of the fieldwork preparation. It was updated throughout the duration of the project to ensure the researcher was familiar with the respondents’ operational context and generally understood operational references within interview content (Johnson and Briggs, 1994; Rubin & Rubin, 2005).
**Determining participants**

The objectives of the research anticipated specific characteristics regarding the location of the enquiry and characteristics of the participants in order to investigate the issues elaborated in Chapters Two and Three. Therefore, multiple respondent experiences were desired, specifically, participants who would facilitate enquiry of the research proposition in a variety of roles and relationships within the organisation (e.g. co-workers, differing groups, and supervisors). The selected research site was able to provide investigation of knowledge generation and sharing practices across groups, levels, functional units, occupations and multiple individuals.

In consultation with the organisation and with its permission, participants were selected on the basis of their positions as professionals and paraprofessionals as depicted in Table 3. A briefing, to which the potential participants were invited, was provided at the organisation’s premises. The senior manager introduced the researcher and confirmed the organisation’s approval and his own support for the conduct of the investigation. Written project notes and a separate consent form were distributed. The project notes were retained by invitees and signed consent forms were returned to the researcher, with contact details (such as email address and phone number) added by consenting participants.

Table 3

*Occupational characteristics of participants*

<table>
<thead>
<tr>
<th>Paraprofessionals</th>
<th>Professionals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formal training associated with the profession</td>
<td>Formal training associated with the profession</td>
</tr>
<tr>
<td>Formal, profession and community accepted body of</td>
<td>Formal, profession and community accepted body of</td>
</tr>
<tr>
<td>knowledge and practices associated with</td>
<td>knowledge and practices associated with practice of</td>
</tr>
</tbody>
</table>


The number of participants initially numbered fifteen. Due to attrition arising from two retirements and one resignation, three participants exited the study during the investigation. On the recommendation of one retiree, (who was a manager), his replacement was subsequently approached and consented to participate in the study, and three interviews at monthly intervals over three months were conducted with this respondent. Additionally, in response to suggestions made by several respondents that the perspectives of novice workers should be captured, the senior manager’s approval was gained to interview four trainees. These were scheduled after final interviews with the experienced workers were concluded. The new respondents were emailed and provided with the identical project information and consent forms as the larger group (see Appendix 9), supplemented by an explanation of the contact, confirmation of management approval, and requesting their participation in a single interview. All four trainees provided consent by return email. The trainee group incorporated two trainee professionals in the course of the graduate training program and two cadet paraprofessionals undertaking the cadet training program (see Appendix 1 Participants’ attributes). In all, there were twelve professionals and eight paraprofessionals, the group comprising ten non-management and ten management participants. Thus, the researcher had
access to multiple interviews with multiple respondents and occupational groups, across trainee, non-management, and management levels.

Morse (1994, 2000) recommends approximately thirty to fifty interviews be carried out where semi-structured interviews are used for data collection. In total, forty six interviews were carried out in this study. The data collection phase for individuals in the experienced worker group over a period of two years, provided prolonged engagement with the research setting and participants (Guba, 1989). The trainee group were interviewed once, and as noted above, the new manager was interviewed three times at monthly intervals. These additional respondents provide important new dimensions and real world data on experienced socialisation and knowledge sharing practices. They represent an example of “controlled opportunism” (Eisenhardt, 1989, p. 539) where the researcher took advantage of new data collection opportunities able to provide insights which will expand the study’s grounding.

This evolution of the research design illustrates the value of thorough theoretical preparation, which informed the researcher’s flexibility, responsiveness to respondent feedback and openness to data gathering opportunities which were consistent with and enhanced the research (Denzin & Lincoln, 2005; Miles & Huberman, 1994).

Care was taken to ensure that participants were not involved without informed consent, pressured to take part, or provided with inaccurate or incomplete information about the true nature of the study and data use (Robson, 2002). For instance, workers freely decided whether to participate, and several staff members present at the initial briefing session opted not to take part in the study. Participants’ names and other identifying information were not discussed by the researcher with other workers or participants and individual arrangements were made privately for each interview to take place. Further, although the senior manager set up the
initial briefing arrangements, he did not request and was not provided with the names or identifying details of those who took part during the investigation.

Data Collection Techniques

Individual interviews

The design and conduct of the individual interviews will be elaborated to account for the data collection process operationalised through the interview process. Firstly, the overall conduct and protocols of the individual interviews, including the creation of interview records, will be described. Following that, the interview design will be described and illustrated to demonstrate the means by which the theoretical constructs argued in Chapters Two and Three framed the data collection.

Semi-structured interviews were chosen for their flexibility and responsiveness to the issues under investigation, the participants, and the information being uncovered within the interview (Hannabuss, 1996), as previously noted. Each interview was conducted on a one to one basis so that interviewees were able to talk freely and without disruption, with the researcher taking a neutral role, seeking clarification where desired and where response was sparse (Mandel et al., 2003).

Interview guides

The focus and content of the interview process was carefully planned to maximise the collection of relevant data. Separate interview guides were developed for the first, second and third interviews conducted with the participants (see Appendices 2 - 4). The sequence and focus of interviews is presented in Table 4.
Table 4

**Question focus and progression across interview sequence**

<table>
<thead>
<tr>
<th>Interview 1</th>
<th>Interview 2</th>
<th>Interview 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of service</td>
<td>Accessing task information</td>
<td>Building knowledge and expertise</td>
</tr>
<tr>
<td>Nature of service history</td>
<td>Sharing information at work – formal mechanisms</td>
<td>Knowledge sharing between experienced and novice workers – examples</td>
</tr>
<tr>
<td>Most interesting and least interesting work</td>
<td>Sharing information within workgroup – influencing factors</td>
<td>Other peoples’ knowledge sharing practices</td>
</tr>
<tr>
<td>Organisation’s mission and goals</td>
<td>Co-workers I share most knowledge with</td>
<td>Knowledge sharing behaviour of ‘experts’</td>
</tr>
<tr>
<td>My area’s mission and goals</td>
<td>Co-workers I share less knowledge with</td>
<td>My own knowledge sharing practices – what and how</td>
</tr>
<tr>
<td>Co-workers</td>
<td>Co-workers who are valuable due to their knowledge</td>
<td>Basis for my knowledge sharing</td>
</tr>
<tr>
<td>Organisational structure</td>
<td>Ideas for increasing knowledge sharing</td>
<td>Professional development support</td>
</tr>
<tr>
<td>Typical communication methods</td>
<td>Impact of ‘knowing how the system works’</td>
<td>Knowledge leakage</td>
</tr>
<tr>
<td>Examples of knowledge sharing working well/not working well</td>
<td>Example of a reward for knowledge generation</td>
<td>Impact of organisational changes and use of external consultants</td>
</tr>
</tbody>
</table>

Table 4 depicts the progression in focus across the sequence of interviews. (See Appendices 2 - 6 for interview guides). This progression ensured that the issues under investigation were explored in a funnelling process which facilitated data gathering, data analysis and explanation of the phenomena. From the themes identified in the literature (see Table 1) specific, open-ended questions were developed to test the research issues, ensure a consistent framework for gathering information, and facilitate the data analysis process (Eisenhardt, 1989; Glesne & Peshkin, 1992). Examples are depicted in Tables 5 and 6.

Use of an interview guide ensured that adequate attention was given to any additional material arising from individual differences as they became apparent (Patton, 1990; Rubin &
Rubin, 2005). Efforts were made to ensure each issue was discussed comprehensively before introducing the next (Mellon, 1990) to support the interview’s coherence and response flow, and reduce backtracking. Inevitably, despite use of interview guides, some backtracking was required and question order varied in some interviews in response to interviewee idiosyncrasy or introduction of relevant content, a common occurrence in semi-structured research interviews (Lofland & Lofland, 1995).
Table 5

Relationship between macro-level research issues and interview questions

<table>
<thead>
<tr>
<th>Research issues</th>
<th>Question example</th>
<th>Interview &amp; Question No</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Knowledge generation</strong></td>
<td>Have any of your ideas been adopted here? What happened?</td>
<td>Int 2, Q 18</td>
</tr>
<tr>
<td>Alvesson (2004); Bogner &amp; Bamsal (2006); Brown &amp; Duguid (1991);</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hamel &amp; Prahalad, (1993); Richter (1998)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Knowledge sharing</strong></td>
<td>Tell me about a situation where knowledge sharing worked well</td>
<td>Int 1, Q 3.4;</td>
</tr>
<tr>
<td>Borgatti &amp; Cross (2003); Deniz &amp; Zarraga-Oberty (2004); Stasser et al.</td>
<td>Tell me about a situation where information sharing did not work well</td>
<td>Int 1, Q 3.6;</td>
</tr>
<tr>
<td>al. (2000); Thompson &amp; Heron (2006);</td>
<td>In what situations do you share your knowledge with people in another department</td>
<td>Int 2, Q 10;</td>
</tr>
<tr>
<td><strong>Contested nature of knowledge construction and sharing</strong></td>
<td>Do you find there are some people that you share knowledge with more freely than</td>
<td>Int 2, Q 12</td>
</tr>
<tr>
<td>Beech et al. (2002); Engstrom (1993); Gherardi &amp; Nicolini (2000);</td>
<td>others, why is that?</td>
<td></td>
</tr>
<tr>
<td>Richter (1998); Valsiner (1998); Van deVen &amp; Johnson (2006)</td>
<td>Can you recall any situations where there were tensions between ‘experienced</td>
<td>Int 3, Q 5;</td>
</tr>
<tr>
<td></td>
<td>hands’ and ‘newcomers’ about how things should be done? What happened?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Can you think of a situation where you may have held back from fully sharing</td>
<td>Int 3, Q 14</td>
</tr>
<tr>
<td></td>
<td>your expertise with a co-worker because you didn’t really hold the other</td>
<td></td>
</tr>
<tr>
<td></td>
<td>person in high regard/</td>
<td></td>
</tr>
<tr>
<td><strong>The worker’s experience of the organisation’s internal environment</strong></td>
<td>What is the purpose of this area/workgroup?</td>
<td>Int 1, Q 2.3;</td>
</tr>
<tr>
<td>Alvesson, (2000); Bock et al. (2005); Collinson &amp; Wilson (2006);</td>
<td>What parts of your work do you find most fulfilling/most demanding</td>
<td>Int 1, Q 2.10;</td>
</tr>
<tr>
<td>Cropanzano, Hinds &amp; Pfeffer, (2003)</td>
<td>How is information and knowledge developed in one area made accessible to other</td>
<td>Int 2, Q 15</td>
</tr>
<tr>
<td></td>
<td>areas?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>When is knowing how to get the system to work for you crucial in achieving a</td>
<td>Int 2, Q 22</td>
</tr>
<tr>
<td></td>
<td>successful outcome</td>
<td></td>
</tr>
<tr>
<td><strong>How the organisation values knowledge sharing</strong></td>
<td>How is special knowledge or expertise usually recognised around here?</td>
<td>Int 3, Q 16</td>
</tr>
<tr>
<td>Bock et al. (2005); Lawrence et al. (2005); Orlikowski (2002);</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Osterlund &amp; Carlile (2005)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Impact of relations with colleagues on knowledge sharing</strong></td>
<td>When you have a new idea or way of doing something, who would you tell about it?</td>
<td>Int 2, Q 8</td>
</tr>
<tr>
<td>Haynes (2005); Koster &amp; Sanders (2006); Menon &amp; Pfeffer (2003);</td>
<td>To what extent would you say your own knowledge sharing is sometimes influenced</td>
<td>Int 2, Q 14</td>
</tr>
<tr>
<td>Thomas-Hunt et al. (2003)</td>
<td>by how you view the other person?</td>
<td></td>
</tr>
<tr>
<td><strong>Outcomes of knowledge sharing</strong></td>
<td>How do you learn to become fully functional</td>
<td>Int 3, Q 3.4</td>
</tr>
<tr>
<td>Bresnen et al. (2003); Goh (2002); Wasko &amp; Faraj (2005)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 6

<table>
<thead>
<tr>
<th>Relationship between micro-level research issues and interview questions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Worker’s affective commitment</strong></td>
</tr>
<tr>
<td>Adler &amp; Kwon (2002); Boyne (2002); Kim (2005); Lawrence et al. (2005); Marshall &amp; Rollinson (2004)</td>
</tr>
<tr>
<td><strong>Trust levels among workers and between workers and their supervisors</strong></td>
</tr>
<tr>
<td>Cameron (2004); Chowdhury (2005); Tagliaventi &amp; Mattarelli (2006)</td>
</tr>
<tr>
<td><strong>Feelings of security and being valued</strong></td>
</tr>
<tr>
<td>Aselage &amp; Eisenberger (2003); Kahn (1990)</td>
</tr>
<tr>
<td><strong>Rewards for job involvement</strong></td>
</tr>
<tr>
<td>Borman &amp; Motowidlo (1997); Fuller et al. (2006); Ilies, Scott &amp; Judge (2006)</td>
</tr>
<tr>
<td><strong>Experienced reciprocity</strong></td>
</tr>
<tr>
<td>Koster &amp; Sanders (2006); Rousseau (2001); Sanders &amp; Schyns (2006)</td>
</tr>
<tr>
<td><strong>Experienced organisational justice</strong></td>
</tr>
<tr>
<td>Cohen-Charash &amp; Spector (2001); Nowakowski &amp; Conlon (2005)</td>
</tr>
<tr>
<td><strong>Discretion to question, innovate and improve</strong></td>
</tr>
<tr>
<td>Baer &amp; Frese (2003); Thompson &amp; Heron (2006)</td>
</tr>
</tbody>
</table>

Tables 5 and 6 depict examples of questions derived from the research issues which were identified through the literature as important for knowledge generation and sharing.

Following the sequencing of issues depicted in Table 4 and the design of the interview procedures, specific questions were developed and allocated to the first, second or third interview to ensure a logical and coherent process and reduce gaps and repetition.
A separate but related interview guide was developed for use in the interviews with trainees, comprising a selection of questions from the first, second and third interviews carried out with experienced workers (Appendix 5). This approach ensured that questions focused on matters within their experience to elicit meaningful responses, and used interview time efficiently.

A unique interview guide was developed for the third interview with the senior manager (Appendix 6), in response to two specific factors. First, there were some issues which had been discussed or were of concern to other respondents (for instance, changes in business strategy and an organisational re-structure) where the senior manager either possessed direct, higher level knowledge or was responsible for the changes. The third interview schedule of questions was, therefore, altered to provide the opportunity to include the senior manager’s information and perspective. Second, during the course of the first and second interviews with the senior manager, the more ‘global’ nature of his role and perspective rendered some questions on the standard third interview guide less appropriate. This was due to his ability to directly influence events as a result of his positional power, as discussed earlier in Chapter Two. These adjustments to the interview guides ensured the interview process was a thoughtful, informed one, sensitive to the respondents and the data capture opportunities they presented (Eisenhardt, 1989, Cepeda & Martin, 2005).

Interview administration procedures

Interviews lasted between forty and ninety minutes, with most interviews lasting in excess of one hour. As there was a very real likelihood of identifying information being provided by respondents (e.g. regarding themselves and others), specific care was taken to
protect the anonymity of respondents to ensure their confidences were not violated. Pseudonyms and case codes were attached to each respondent’s interview records (King, 1994). At the conclusion of each interview, participants were advised of the “next steps,” i.e. what would happen to the data gathered at this interview.

To provide accuracy and a lasting record, and to free the interviewer to focus on the process (Robson, 2002), interview data were recorded by audiotape and the researcher’s handwritten notes using the interview guide proforma. Forty-six useable transcriptions resulted from the interviews. Audiotapes were transcribed by professional transcription typists as soon as practicable after recording. Significant difficulties were experienced, however, when the primary transcriber moved interstate, taking the audiotapes amongst her possessions. Multiple efforts over a nine month period by the researcher to re-establish contact and retrieve the tapes were unsuccessful. Direct intervention by a senior university official resulted in return of the audiotapes. The transcriptions of these tapes were subsequently able to be completed.

With one exception, interviews took place in private meeting rooms or individual offices on the premises of TransportServices. One interview was conducted at a nearby coffee house when the meeting room was unavailable, however, there were no other patrons at the time of the interview. It was audio-taped and later transcribed. Following each interview, the audiotape and the interview notes were reviewed to assist sensitivity to emergent, alternative and additional issues, identification of issues to be followed up, and data analysis. Ongoing debriefings were held with the researcher’s colleagues to review the conduct of the data collection process and the researcher’s impressions of emergent issues (Eisenhardt, 1989).
In the first interview, the purpose of the study was reiterated briefly to participants at the outset of the first interview and participants were given the opportunity to ask questions about the study’s purpose, process, information storage and use for formal and informal purposes (Flanagan, 1954). The researcher provided project and personal information including interest in the topic and shared industry experience as relevant to the study. Reassurances were provided that: (a) the participants were not being judged as a result of providing information, (b) the researcher merely wished to describe what happens in their organisation, and (c) the contents of the conversations would be held in confidence and made anonymous wherever possible (Holliday, 2002). Permission to tape-record the interview was gained after explanation of the above points. In addition, as recommended by Robson (2002), the respondents were advised that although they may find some questions difficult to answer, their opinions and experiences were valued.

In the introductory phase of the interview, questions to establish interest and rapport and to identify any related aspects of the respondent’s history were explored through questions such as: “(a) Tell me about your background and experience, and (b) Tell me about your work here.

Subsequent interviews began with conversation to re-establish contact and the context of the enquiry, and commenced with a request for permission to audiotape the interview (King, 1994). Respondents were provided with opportunities to ask questions or seek clarification on matters arising during or since the earlier interview/s (Rubin & Rubin, 2005). Following this, the interview proper began and proceeded as described above.

In summary, in this section, the detail of the research procedures and data collection have been discussed and justified in order to demonstrate their appropriateness to provide data
which illustrates and supports the purpose of the enquiry. In the following section, the data analysis procedures will be elaborated, providing a foundation for the presentation of results in subsequent chapters.

Data Analysis Procedures

Ideally, all practical investigations should result in clear, convincing conclusions that are based on careful and thorough analysis of the evidence, free from dissembling, misinterpretation or bias (Yin, 1994). While this goal is a nice ideal, qualitative inquiry frequently produces large quantities of data, capable of being categorised and interpreted in a variety of ways, potentially in subjective ways. Here, the interview transcripts were analysed using a cyclical, iterative process of reading and coding based on a priori and emerging themes, using NVivo 7 software to provide rigour and consistency to the analyses. The findings are reported through three levels of analysis. At Level One, codes were allocated to identify passages of text dealing with specific issues or topics. At Level Two, the codes were grouped into sub-categories which provided logical clusters. At Level Three, the sub-categories were then organised into categories that reflected sense making and cognate issues, which the sub-categories naturally informed.

Example of data analysis procedure

In order to advance the rigour applied to the data analysis, the data analysis procedure of the category ‘Environmental Complexity’ is now discussed in more detail and illustrated. In preparation for the development of coding, statements by respondents from different status levels (e.g. managers, engineers, trainees) and across occupational groups were reviewed in
order to ascertain the elements which are interrelated. This review phase constitutes a preliminary step to aid coding development and the identification of meaningful and appropriate second level sub-categories, by establishing important issues and themes in the data (Miles & Huberman, 1994). Data analysis proceeded as illustrated at Figure 5. When coded at Level One, respondents’ statements illustrate interactions between different aspects of the environment, the organisation and its members, such that an influencing or mediating role is evident.

Figure 5 Development of data analysis for category “Environmental Complexity”
Figure 5 depicts the process whereby statements illustrating direct influence (e.g. the organisation’s strategic business goals or market conditions) were readily identified for inclusion at Level One. Similarly, statements discussing aspects of the external environment, engagement with the broader professional community, the opportunities and constraints afforded by the public sector context and the general impact of change are also grouped at this level of coding. Data describing more specific interactions such as those with external consultants are also located in the category entitled ‘environmental complexity’. This is because numerous respondents discussed these interactions in ways which identified not only relationship management challenges with external parties, but concern for the impact on their own roles and potential for knowledge leakage to external parties from TransportServices. Thus, the refining process resulting from review of the evidence gathered during the data collection process resulted in some modifications to initial categories.

Example of data analysis from Level One to Level Two

The following examples across a range of categories are provided to demonstrate the consistent and evidence-based coding process adopted in this investigation. The following text was coded as ‘length of service and background’ and sub-categorised as ‘external factors impacting on expertise:’

I’m trained as a civil engineer. I’ve had a number of jobs, all sorts of jobs through university … when I started professional employment I’ve been working at the railways. (Robert)

Similarly, the text shown below is coded ‘my reaction to the increased use of consultants’ and grouped at the Level Two sub-category ‘internal organisational environment:’
But the dilemma is that you then get in from the consultant and you’ve got to check it. You find things they overlooked. Like three or four jobs at the moment where there is quite critical things that need to be built and built by other authorities before we can do our work. Normally when you doing those things yourself, they are the first things you put in train if we finish the design. The consultants are sort of leaving that in limbo, not perhaps having ownership of it, they don’t fully appreciate that it delays the whole friggin’ project. They should have put that forward earlier, but that is real life. We can’t do the job, but then we get hammered if the consultants are late or if it’s an inferior product. People can say ‘well the consultant-base is done why are you checking’? You have this dilemma. (Barry)

The text shown below is coded ‘drivers for change’ and grouped at the Level Two sub-category ‘operational goals and framework:’

The other need was the accelerating coal business, because of the upturn market particularly in China, Japan, particularly Japan but driven by the economics in China and India in particularly – driving the world economy – the need for coal has increased dramatically and that has created a huge demand for the other significant part of our network – the coal network. So it is really from that need it’s seen that the only way we can meet those needs was to try to get closer to the business need rather than to a more general consulting need. (James)

The text below is coded ‘example of knowledge leakage’ and grouped at the Level Two sub-category ‘knowledge leakage:’

We had a similar PO5 leave about three months ago. Nothing was particularly done to say tempt him to stay. Nothing was really done to try and say – once they knew he was leaving, there was no work done for example, succession plan type scenario. We say right ‘this PO4 or this PO4 you’ll pick his brains for the next three months’. Which I would have thought would be the first thing you’d do. Greater minds than mine have chosen not to. Now they are just starting to look for a replacement which again seems quite silly. He’s been gone for three months and now they are looking for someone to replace him. It does beggar belief sometimes (Cameron)

The following text is coded ‘induction and socialisation’ and grouped at the Level Two sub-category ‘socially situated practice:’

When they come to us we usually tell them what we are doing, design, drafting...we know that they graduate engineers do not have experience. We… tend to give them more job like…checking, checking the design of the experienced engineers just to give them a feel of what we are doing. It is not designing, it is a
small project and gradually goes difficult…under the experienced engineers’
guidance (Henry)

In sum, analysis and coding proceeded in this way resulting in the identification of a
large number of Level One codes (see Appendix 7: Level One data analysis codes). This
appendix presents codes identified from interview data across the process of: (a) first round,
(b) second round, (c) third round, (d) trainee, and (e) the especially adapted senior manager
third round interview. As previously described, respondents became more expansive as trust
developed and their interest in the project increased over time and through protracted contact.
This more expansive data resulted in fuller narratives, personal observations and
interpretations of events, and reflections about their own and their co-workers’ motivation and
behaviour. Consequently, new, additional codes were required and data analysis for second
and third round interviews is more extensive.

Careful analyses of Level One codes was undertaken to identify Level Two sub-
categories. Relationships identified between Level One codes and Level Two subcategories
are depicted in Appendix 8 (Examples of relationships between Level One data analysis codes
and Level Two sub-categories). In this way, while informed by a priori constructs, the data
analyses go beyond imposition of a priori constructs that could potentially limit the data
analyses, being grounded in and responsive to the data gathered in this investigation. This was
considered important, because adopting a rigid content analysis (Weber, 1985) approach may
result in data reduction and information being discarded in order to conform to predetermined
codes and statistical analysis (Robson, 2002). Further, identification and exploration of causal
relationships can become difficult in the content analysis approach. Thematic coding (King, in
Symon & Cassell, 1998), therefore, provided the middle ground between the application of
predetermined codes through content analysis and the absence of a priori codes typical in the
grounded theory (Glaser & Strauss, 1976) approach.

Care was also taken to avoid imposing meanings reflecting the researcher’s concerns
rather than those of the participants. However, occasions were encountered when respondents’
statements illustrated more than one theme. For instance, in describing their understanding of
the organisation’s mission and purpose, respondents commonly noted factors which related to
the environmental complexity of the organisation’s setting, which in turn influenced the
internal organisational environment. Such statements are, therefore, coded at both themes to
ensure appropriate contextual nuances were not lost.

For this investigation, interest focuses on identifying evidence of influences on
knowledge generation and sharing and the implications and impact of the influence on further
knowledge generation and sharing. The a priori constructs derived from the literature and
presented in Chapters Two and Three, and categories derived from the data are now illustrated
in Table 7.
Table 7

*A priori constructs from the literature and categories established through data analyses*

<table>
<thead>
<tr>
<th><em>A priori constructs</em></th>
<th><em>Dissertation categories</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Complexity</td>
<td>Macro-level environmental factors</td>
</tr>
<tr>
<td>Operating environment</td>
<td>The organisation’s mission and characteristics</td>
</tr>
<tr>
<td>Industry, e.g. special nature of the industry and sector</td>
<td>Nature of the industry</td>
</tr>
<tr>
<td>Drivers for change</td>
<td>Drivers for change</td>
</tr>
<tr>
<td>Profession, e.g. values and practices</td>
<td></td>
</tr>
<tr>
<td>Impact of the work nature and demands</td>
<td></td>
</tr>
<tr>
<td>Socially situated practice</td>
<td>Socially situated practices</td>
</tr>
<tr>
<td>Contested workplace relations among workers</td>
<td>Contested workplace relations</td>
</tr>
<tr>
<td>Climate for knowledge generation and sharing</td>
<td>How expertise is constructed here</td>
</tr>
<tr>
<td>Construction of knowledge and development of expertise</td>
<td>Profession e.g. values, practices</td>
</tr>
<tr>
<td>Value attributed to knowledge and expertise</td>
<td>How innovation and expertise are valued here</td>
</tr>
<tr>
<td>Contributors to knowledge leakage, e.g. local practices and actions</td>
<td>Knowledge leakage</td>
</tr>
<tr>
<td>Micro-level</td>
<td></td>
</tr>
<tr>
<td>Individual worker’s orientations and characteristics</td>
<td>Micro-level mediators</td>
</tr>
<tr>
<td>Affective organisational commitment, e.g. trust between worker and organisation and its representatives</td>
<td></td>
</tr>
<tr>
<td>Extent of organisational citizenship behaviours</td>
<td>Interpretations of evidence of outcomes and rewards at macro and local levels</td>
</tr>
<tr>
<td>Perceptions of organisational justice and feelings of security</td>
<td></td>
</tr>
</tbody>
</table>

Table 7 presents the a priori constructs and the categories arising from the analyses of data. It demonstrates the value of the review of relevant literature in selecting important issues before the commencement of the investigation. These were tentative constructs which allowed interview planning and development of interview guides (Eisenhardt, 1989). Subsequent analyses of the data identified additional concepts, strength of the evidence and alternative emphases, which, in turn, informed clustering of themes and identification of final categories (Rubin & Rubin, 2005). For instance, as presented in Table 7, ‘the values and practices of the profession’ were firstly seen as a factor contributing to the environmental complexity of these participants. However, analyses of these data revealed that these factors constituted an important influence for workers’ knowledge generation and sharing behaviour at the socially
situated level within their local sites of practice. In this way, thorough analytical procedures explained the data to firmly underpin the dissertation’s findings.

On the basis of commonalities (Cepeda & Martin, 2006), participants are grouped into categories of attributes based on the following characteristics: work status (e.g. professional/paraprofessional, management/non-management, trainees (containing both groups of novices)), and age groups (e.g. more than 20 years’ service, less than 5 years’ service). This step enabled follow up and comparison where desired and is shown in Appendix 1 (Participants’ attributes).

The data analysis procedures have been elaborated here as premises for the presentation of results in subsequent chapters. The processes of analysis and coding have been described here and examples have been provided to illustrate the rigour of the process. In the following section, limitations of the research design are summarised.

Limitations of the Research Design

This investigation has been designed to incorporate the principles and practices of good research method and procedures, as set out above. During the planning and literature review phase, careful examination of expert researchers’ practices contributed to understanding of an appropriate research design, as recommended by Wolcott (1994). It is acknowledged however, that there are limitations which limit claims for the study’s findings and their generalisability and transferability. The study comprises a single case study rather than multiple cases, thereby preventing cross case replication and analysis (Eisenhardt, 1989). Single cases can, however, illuminate research issues (Miles & Huberman, 1994; Yin, 1994) and in this enquiry, the research site was selected due to its capability to meet the desired
characteristics for the research design, which emerged from the theoretical framework as
described previously.

The single data collection method of individual, semi-structured interviews may be
considered a threat to this investigation, as qualitative research is frequently a multi-method
approach. Multiple interviews with multiple respondents about the same issues are
recommended as providing triangulation in qualitative research by King (1994). Nelson,
(1992) advises “choice of research practices depends upon the questions that are asked, and
the questions depend on their context” (p. 2). Individual semi-structured interviews were
selected as (a) the purpose of the study is to gain data which explains and illustrates
mediational influences on antecedents to behaviour and behavioural practices, i.e. ‘the space
between,’ (Bradbury & Bergmann Lichenstein, 2000), and (b) individual semi-structured
interviews provide opportunities to seek explanations from the participants about their
perceptions, attitudes, and relations with others (Glesne & Peshkin, 1992), as previously
discussed. In addition, individual semi-structured interviews provide the opportunity to gain
stories which illustrate abstractions and the ways in which meaning is constructed from
experience.

It is acknowledged that twenty may be considered a small number of participants.
However, Patton (2002) recommends similar sample sizes as appropriate for qualitative
studies. Although the enquiry’s findings are context-specific and not necessarily generalisable,
depth of contact is achieved through conducting a series of interviews, i.e. commencing,
progressive and summative with most participants over a period of two years, as described
above (Billett, Barker & Hernon-Tinning, 2002). Such prolonged involvement with the
research setting assists acceptance of the researcher and lessens the likelihood of biased
information (Robson, 2002). Further, a replication strategy ensures that for each occupational group, level (e.g. management/non-management) and type of trainee, multiple respondents were included in the study to provide comparable case data (Miles & Huberman, 1994). The sampling design was, therefore, theoretically driven, rather than focusing on representativeness or convenience.

Actions taken in this study to build trustworthiness and address further threats are summarised in Table 8, adapted from Padgett (1998, p.95). The table highlights common limitations to qualitative research designs (threats to validity, researcher bias and respondent bias). Five strategies are then identified to reduce threats to validity, researcher bias and respondent bias, namely: (a) prolonged involvement, (b) triangulation, (c) peer review and support, (d) member checking, and (e) audit trail (Robson, 2002). Controls and actions taken through the research design and procedures demonstrate incorporation of the strategies in this investigation.
Table 8

*Threats to validity and remedial actions*

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Threat to validity</th>
<th>Researcher bias</th>
<th>Respondent bias</th>
<th>Remedial action in this study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prolonged involvement Triangulation</td>
<td>Reduces threat</td>
<td>Increases threat</td>
<td>Reduces threat</td>
<td>Three interviews over 2 year period</td>
</tr>
<tr>
<td></td>
<td>Reduces threat</td>
<td>Reduces threat</td>
<td>Reduces threat</td>
<td>Multiple interviews with multiple respondents</td>
</tr>
<tr>
<td>Peer review and support Member checking Audit trail</td>
<td>No effect</td>
<td>Reduces threat</td>
<td>No effect</td>
<td>Debriefings and reviews throughout data collection period</td>
</tr>
<tr>
<td></td>
<td>Reduces threat</td>
<td>Reduces threat</td>
<td>Reduces threat</td>
<td>Debriefing with Senior manager</td>
</tr>
<tr>
<td></td>
<td>No effect</td>
<td>Reduces threat</td>
<td>No effect</td>
<td>Detailed description &amp; documentation of research design and data collection provided</td>
</tr>
</tbody>
</table>

(Adapted from Padgett, 1998, p. 95)

Table 8 illustrates the specific actions taken in the study to reduce threats to validity, researcher bias and respondent bias in the research design and throughout the conduct of the research, through careful planning, documentation, review and consultation. As noted above, multiple interviews were conducted with respondents (excluding trainees). Prolonged contact with respondents over a two year period (with the exception of the four trainees) allowed the relationship and data collected to move beyond a superficial level and allowed data collection over time.

A rigorous process of debriefing and review was conducted with colleagues throughout the research design, data collection and data analysis phases, providing a process whereby testing of assumptions, a priori categorisation, analysis of data and ongoing identification of opportunities and sensitivity to emerging themes was ensured (Freeman et al., 2007). During the debriefing with the key stakeholder (i.e. the senior manager), initial impressions of the data were reported and the stakeholder’s feedback and dissenting views
were sought (Duneier, 1999). Further reporting to the key stakeholders and all respondents in the form of a written report and seminar occurs on completion of the data analysis and interpretation phase. Finally, systematic, comprehensive documentation of the literature review and theory development phase, research design, data collection and analysis and data interpretation phases are provided to create an audit trail (Padgett, 1998; Robson, 2002).

The primary purpose of this case study is an explanation of a specific phenomenon within the research setting. The individual nature of the responses means that the information and beliefs provided by respondents is influenced by their ongoing experience and may be impossible to reproduce as is typical in studies of this kind. However, analytic generalisation is anticipated to some extent, in that it is expected that some theoretical outcomes will result for application in other settings (Sim, 1998).

In summary, although concern for trustworthiness has resulted in consideration for and construction of quality throughout the investigation and interpretation of its outcomes (Freeman et al., 2007), specific limitations exist in the research design elaborated in this chapter. Further research could fruitfully be carried out into the influence on knowledge generation and sharing practices of relations between organisations and their workers, and the relations among co-workers, to extend and expand comparison with the results reported in the present enquiry.

The following section summarises the design, methodological and procedural issues addressed within Chapter Four. It provides a summary of the key points and links to the following chapters which present the findings and discussion.
Conclusion

This dissertation is focused on the research proposition that knowledge sharing in the organisational setting is mediated by the relations between organisations and their workers, and the relations between workers. Firstly, the study’s orientation was discussed to provide the framework for its purpose and approach. A qualitative, constructivist, interpretative approach has been adopted to provide the flexibility to gather and study the accounts and subjective interpretations of individual participants within the research setting, enabling identification and interpretation of consensus at the group level (Guba & Lincoln, 1998).

Secondly, the research approach and design were described and justified in relation to the dissertation’s purpose and context, establishing the rationale for the research method and techniques. The case study method was established as the research strategy as this dissertation enquires into a real life organisational setting, events, issues and participants, and uses multiple sources of evidence (Yin, 1994). The case study approach allows contextualisation of the enquiry, so that the socially constructed interpretations and perspectives of respondents in relation to the object of the research proposition can be investigated. The detail of the research procedures and data collection were discussed and justified in order to demonstrate their appropriateness to provide data which illustrates and supports the purpose of the enquiry (Holliday, 2002). The data analysis procedures were elaborated as a foundation for the presentation of results in subsequent chapters.

In summary, this chapter establishes that the dissertation’s research methodology meets the major characteristics of ‘good’ research design (Cresswell, 1998; Robson, 2002). The investigator extensively researched the relevant and recent literature to ensure the research design’s appropriateness and to maximise strategic data collection (Denzin &
Lincoln, 2005). Multiple data sources were used to provide adequate data and detail has been provided as to how the data were collected (Patton, 1990; Yin, 1994). Consistent with the qualitative research approach, the research design evolved in response to emerging data, purposeful opportunities to enrich data collection, and insights originating from respondents (King, 1994). In response to additional data gathering opportunities, the researcher demonstrates adaptiveness while remaining faithful to the research purpose and the conceptual framework (Cepeda & Martin, 2005).

Multiple reality representations have been obtained by the researcher, who functioned as a data collector (Bogdan & Biklen, 2006). The research has been informed by and employs a well understood tradition of enquiry to investigate a single problem: that knowledge sharing in the organisational setting is mediated by the relations between organisations and their workers, and the relations among workers (Miles & Huberman, 1994). Data collection adhered to the design requirements and research practice protocols (Holliday, 2002). Further, a rigorous approach to detailing the methods, procedures and data collection has been followed, accounting for the complexities and challenges encountered in the course of the study’s investigations (Lincoln, 2002; Rubin & Rubin, 2005).

The limitations in design and execution have been specified. The quality measures and controls built into the research design to provide trustworthiness have been described and justified. For example, five strategies were identified to reduce threats to validity, researcher bias and respondent bias, specifically: (a) prolonged involvement, (b) triangulation, (c) peer review and support, (d) member checking, and (e) audit trail (Padgett, 1998). Application of those measures that relate to the study’s outcomes will be detailed further in later chapters.
In sum, the research procedures for the collection of data and the processes for the analysis of the data have discussed and justified, in order to provide a comprehensive and coherent picture of the research methodology adopted for this dissertation. In the following chapters, the empirical data will be presented and discussed. First, Chapter Five will present and discuss the findings related to the factors in the macro organisational context which influence the relations between workers and their organisation and, hence, workers’ knowledge sharing practices.
CHAPTER FIVE
MACRO-LEVEL MEDIATORS: ENVIRONMENTAL COMPLEXITY IN KNOWLEDGE GENERATION AND SHARING

This dissertation proposes that knowledge sharing is mediated by the complex relations between organisations and their workers, and the relations among workers. The dissertation seeks to investigate this claim within a public sector organisational setting. To proceed with such an analysis, investigations are required at both macro and micro levels (Robson, 2002). In previous chapters, influencing factors at macro, situated and micro levels have been advanced.

In Chapter Two, factors in the macro organisational context that (a) influence the relations between workers and their organisations and (b) operate as antecedents to knowledge sharing practices, are identified and elaborated. Subsequently, Chapter Three discusses micro-level influences (that is, those at the situational level) which shape individual workers’ understanding of and relationship with the organisation and their colleagues, thereby shaping individual knowledge sharing behaviour.

The importance of knowledge generation and sharing for organisations’ sustainability and innovative capacity is well established (Bogner & Bansal, 2007; Hamel & Prahalad, 1993; Leonard & Sensiper, 1998; Spender, 1996). Pressure has arisen from technological change, competitive forces, and economic imperatives, for effective knowledge generation and sharing practices in organisations. Indeed, development of new knowledge has been found to maximise organisational effectiveness, and the characteristic combination of resources, capabilities, processes, practices and outputs that constitute an organisation’s competitive
edge (Hall et al., 2000; Kogut & Zander, 1997). Central to this competitive edge are an organisation’s unique combinations of workers’ personal expertise, capabilities, social knowledge, relationships, networks and social structures.

The findings presented and discussed in this chapter illustrate the influence of macro-level environmental factors upon knowledge generation and sharing. The environmental complexity is considered to create the setting for interactions which will impact on a range of external and internal environmental framework issues. These issues include: (a) workers’ beliefs about their organisation’s purpose, (b) workers’ understanding of the contribution which their area and role is expected to make to achievement of that purpose, and (c) the organising principles and structure which determine workers’ roles and tasks. These macro-level factors, in turn, shape workers’ perceptions and beliefs about what is important, what is valued, and their experienced reality (Bock et al., 2005). In this chapter, results will be presented and discussed relating to the influence of factors in the organisation’s complex environment on employees’ perspectives and behaviour.

Previously, elements of the macro-level external and internal environments were identified as key influences on the organisation’s goals, strategy and implementation actions. Following Schein’s (1985) suggestion that respondents themselves identify the most salient events, data illuminating each theme will now be presented and discussed in detail. Findings illustrating socially situated influences and micro-level mediators on knowledge generation and sharing are reported in Chapters Six and Seven respectively.

The chapter is structured in this way. Data and findings associated with each theme are identified and discussed in turn. Data relating to each theme are presented and the relationships between the data, the underpinning theoretical constructs and the dissertation’s
proposition are advanced. Discussion of these relationships provides a comprehensive illustration of the factors in the macro organisational context which influence the relations between workers and their organisation, and shape workers’ knowledge generation and sharing orientations and practices. Finally, the contribution of this chapter in support of the research proposition is summarised.

Organisation’s Mission and Purpose

Workers develop understanding of what is valued and valuable through what they experience as the organisation’s interests. In turn, their individual knowledge generation and sharing orientation and practice are likely to be shaped by this understanding (Jarvenpaa & Steples, 2001).

In order to identify the origin of workers’ understanding of their organisation’s business objective, respondents were asked to describe the organisation’s mission and purpose. Comparison of statements by respondents across occupations and role status was undertaken in Table 9.
Table 9

*Perceptions of the organisation’s mission and purpose by status and occupation*

<table>
<thead>
<tr>
<th>Informant Description</th>
<th>Verifying evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>James (a manager)</td>
<td>TransportServices is seeking to be one of the major rail businesses in (in the country) and is expanding interstate and trying to ensure that it captures the majority of existing business.</td>
</tr>
<tr>
<td>Duncan (supervisor, engineer)</td>
<td>I guess to be a major, to be a major transport player. Initially it used to be just this state but now it’s (national), of recent years. That’s where I see us as being a major transport operator. We’re committed, of course, to running passenger trains, which are a loss financially to the organisation, but we get Government support with that.</td>
</tr>
<tr>
<td>Robert (engineer)</td>
<td>Our principal services, providing rail infrastructure and rail freight and passenger services.</td>
</tr>
<tr>
<td>Cameron (design drafter)</td>
<td>I’d say would be to move passengers and freight, probably freight and passengers in that order.</td>
</tr>
<tr>
<td>Ed (graduate trainee)</td>
<td>The purpose of this organisation, I should be reading the weekly notice, but anyway in my personal opinion, is probably to build a better Australia. That is very broad of course, because by building a better (country), it can mean building the infrastructure, serving people so that the people of (this country) can have a better standard or quality of life. Transportation is essential. It can be passenger transportation or things, items or containers or it also helps the country’s economy by exploiting or helping, actively involved in the country’s export activities. Again it all boils down to helping the country, (everyone) to have a better standard of living.</td>
</tr>
<tr>
<td>Gerald (trainee design drafter)</td>
<td>I think the overall goal is to be the …number one bulk railway.</td>
</tr>
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</table>

This data indicates a high degree of consonance or shared understanding among these respondents, who describe their organisation as expansive, competitive, and success-oriented. They believe the organisation’s future lies within the transportation business. They expect that its future activities will expand beyond its home state to the provision of national rail infrastructure and services on a competitive basis, with the goal of becoming the leading provider, and, by inference, surpassing other rail providers. In essence, the key contributing factor in the organisational environment is its business goal, described by James (a manager) as follows:

TransportServices is seeking to be one of the major rail businesses in Australia and is expanding interstate and trying to ensure that it captures the majority of existing business… We need information about new technology. So that’s usually supplier
or manufacturer. Often they’re in the forefront of that. We keep pretty good links
with universities and research people. But I think … we do drive the industry in
terms of where to go (James, manager).

The strategy indicates attention to developing absorptive capacity (Cohen & Levinthal,
1990) wherein increased organisational capacity results from improved ability to access, use
and adopt, externally and internally accessible knowledge. In comparison, Gerald has been
employed by TransportServices as a trainee design drafter for less than two years (compared
with James’ more than 20 years’ service). In terms of organisational status, he is at a junior
level. He describes the organisation’s mission and purpose in this way:

Likely, to be the number one rail group in the country…I think three years ago
there was seven national rail players and now we are only down to two which is us
and (Natrail) …. So I think the overall goal is to be the country’s number one bulk
railway (Gerald, trainee).

While the elaboration of the key statement differs – the sentiments are the same - there
is agreement on the central goal statement from the respondents who were the most senior and
most junior participants in terms of length of service and status. Both are clear in stating that
the organisation’s goal is to be the leading rail business in the country. They position
TransportServices as having an environment in which competitive edge, organisational
knowledge and contribution to knowledge sharing are important (Huber, 1991; Stewart,
1997). So, the process of knowledge sharing has achieved some degree of shared
understanding or inter-subjectivity, with all workers not surprisingly being aware of the nature
of the enterprise and its focus: its strategic goal of becoming a nationally dominant provider of
bulk freight.

The senior manager’s comments above describe the proactive approach
TransportServices takes in managing its sustainability. He notes that TransportServices
engages with its industry community in order to gain new knowledge and maintain currency
with developments. Specifically, its inter-organisational contacts provide it with new information on technology (i.e. suppliers or manufacturers) and research (e.g. universities and research people). This engagement illustrates ‘an active stance of learning and development rather than imitation of the achievements of others,’ considered by Kogut & Zander (1997, p. 17) to be essential for organisations that desire to create new capabilities. The ability to absorb and utilize external knowledge for competitive purposes is positively related to improved business sustainability (Cohen & Levinthal, 1990; Tsai, 2001).

The business goals and strategy to which TransportServices aspires are based upon its ability to outperform its competitors. Essential to this ability is shared staff purpose in achieving their goals – sharing knowledge as a purposive practice. The specialised nature of railway operations and the expertise associated with its practice demonstrate the situated nature of knowledge construction. In the next section, findings illustrating the unique nature of rail knowledge and the implications for rail knowledge management will be elaborated.

Specialised Nature of the Industry

The nature of knowledge about railways and rail operations is held by respondents to be unique and highly specialised. Hence, the knowledge and skills involved in the practice of their respective professions are a contextually and collectively constructed body of knowledge (Gherardi & Nicolini, 2000). The complex, focused nature of rail design work is not immediately apparent to the observer and the novice. For example, Gerald is a trainee design drafter who has been with the organisation for a short time after completing his technical qualifications:

When I first started work I thought how hard could it be to draw two parallel lines. I got a pretty big shock when I first started … There is so much to learn and I
didn’t realise how much there is – but they say eight years generally if you are on the ball, but there are guys been here for years and years and years, that know so much, and I don’t know, I’d like to be a sponge and take everything in (Gerald, design drafter).

Gerald describes his surprise at the scope and depth of the knowledge and skills required to apply his technical qualifications in the rail sector. He recognises the expertise developed by longer serving workers, and undertakes to learn the lessons available from the accumulated experience, insights, and personal design skills of the rail professionals in his workgroup. Gerald has, therefore, identified that the knowledge that he wishes to learn is held by the collective of long serving workers and constructed within the context of their work practices. Development of his knowledge and skills will be influenced by the knowledge sharing practices of the collective and his willingness to learn from them (Lave & Wenger, 1991).

Elaborating on the unique nature of rail work, Nick suggests that certain expertise (such as design of rail networks, turnouts, level crossings) is not required by other industry applications: “Railways are a fairly specific profession … railways structures, for example, is pretty much just for railways. I mean you can’t really transfer that sort of thing anywhere else” (Nick, engineer).

Gerald further identifies that only the initial training in general concepts and task skills has been provided by his pre-TransportServices qualification. The development of his key operational knowledge will take place within the work setting:

At TAFE (technical training college) they will teach you how to draw a bridge, design a bit of road, but there is nowhere at TAFE where you can do a railway. It is pretty rare. I don’t think there is anywhere you can go to get an education on how to design a railway. Everything in here is learnt in here, there is a lot of in-house training and teaching. You can’t go outside and pick it up (Gerald, trainee).
Following the acquisition of basic skills at college, Gerald expects his most valuable learning and development as a rail professional to occur within TransportServices. The knowledge and skills necessary to carry out this work are understood by these professionals and paraprofessionals to transcend their formal qualifications, acquired through practice of the profession following successful completion of the relevant formal training and award (Gherardi, Nicolini & Odella, 1998). Indeed, some respondents (for example, James, an engineer and manager and Joe, a design drafter and supervisor) separately describe their group as ‘custodians of the discipline’ in developing and applying their practice in the work setting. The development of a strong sense of professional identity and a sense of being an ‘insider’ contribute to the construction of a work identity (Alvesson, 2004; Richter, 1998). For instance, the respondents describe themselves as ‘professionals’ and as ‘insiders,’ and their work as ‘knowledge intensive.’

Angus (a design drafter) describes the complexity of his work in the following way:

We need to not only think about how fast the trains are going to travel but we need to think about how it is going to affect …other issues: the owners, land, environment, speed of the trains, the track, the grades, whether or not we try to economise money so that we don’t have to cut through because that tends to be very expensive. So what we need to do is actually try to minimise the costs to make sure that all our alignments are constructed … It gets really involved (Angus, design drafter).

Major changes have occurred in the rail sector in recent years. Prior to these changes, all rail operators, their plant and infrastructure were government-owned and operated, with state governments possessing their respective rail operations. In recent years, a new operating approach has emerged in which infrastructure, (e.g., the physical rail network), is separated from the provision of rail transportation services in an ownership and management sense. In some states, the rail operations have been sold by their government owners, i.e. privatised. The available pool of knowledgeable and qualified rail professionals has diminished through
staff shedding, retirements and reduced recruitment. Additionally, the lag caused by the time taken for recruits to develop advanced skill levels is described by Robert, an engineer:

All these organisations have been shedding staff in preparation for sale to make them more attractive and in the process they’ve shed a lot of their expertise. So there’s not a big pool of people … they’ve stopped taking on trainees, graduates, so as people retired out of the organisation or went elsewhere they didn’t replace them. And so the expertise pool nationally has basically just dried up.

TransportServices is one of the few … state rails over the last 3 years that has been putting on graduates and training them up. But there’s quite a long development time, so finding people with rail experience is very difficult at the moment (Robert, engineer).

Investment in technical skills development for rail is seen to contribute value to the organisation as it creates the necessary skill repertoire:

The sort of skills we’re looking for here, particularly in our … design area … are not really available outside of the industry … If you advertise, you get no applicants. So we have to grow them ourselves … So they add value to us, and we put a big investment in them (Dennis, design drafter).

Dennis refers to the knowledge and skills gap being due to the generalist nature of training provided through universities and technical colleges, and the lack of specialised training available for the rail industry. Tom, an engineer notes: “Track engineering hasn’t been taught in university.” Consequently, as previously noted, there is a small pool of rail expertise. Rail operators and associated service providers must either poach expertise from competitors or invest in training.

TransportServices actively recruits and trains young entrants to the rail industry, in a range of training schemes across the organisation’s wider operations. In support, Cameron (design drafter) states: “government organisations … should have a social obligation (to) take on trainees.” Within the professional and paraprofessional groups informing this dissertation, trainee railway engineers are recruited either directly from university or at an early stage in their professional career. These trainees are called rotational engineers due to the rotations
through various operational areas during their training program. Trainee design drafters (known as cadets) are similarly recruited for the paraprofessional area.

Recruitment of newcomers with recent training provides access to those individuals’ information about current external engineering and design drafting techniques and expertise with new technology. The collective knowledge is, thereby, regularly enhanced (Nonaka & Takeuchi, 1995). As Angus (a design drafter) notes: “the new people, they themselves bring change and bring knowledge into the section we probably don’t know about.” The process identified by Angus is important in facilitating the connection of information, ideas and knowledge between people in the organisation (i.e. collective cognition) (Hargadon & Bechky, 2006), and between the organisation and the external environment. Value is added to TransportServices through: (a) the development of additional worker expertise, and (b) the potential for re-framing current approaches which accompanies the addition of new information and perspectives to a work group. So, the need for effective knowledge sharing is accentuated.

Introduction and adoption of relevant technology has dramatically altered the way some tasks are executed, according to William:

We’ve got … the type of drawings we do, going back to the conception of TransportServices, very old drawings … The introduction of computer aided drafting was a major change. It meant we could do more complicated designs a lot easier …When I first started, it was all done with slide rules and we would spend 3-4 days just doing calculations before we’d actually put pencil to paper (William, engineer).

Indeed, TransportServices was described as an ‘early adopter’ in technology introduction by Duncan, who notes: “They’ve been pretty good with supplying good quality equipment, latest up to date (technology). It’s a pleasure to work with.” Introduction of new technology has facilitated the streamlining of task processes. In particular, the mechanical
aspects (e.g. calculations) and development of project databases have been streamlined, as noted by William.

In TransportServices, safety is of paramount importance as noted by all respondents (for example, “Number one and foremost is a safety perspective” – Cameron). Standardisation is claimed to be necessary to achieve safety, consistency in design and construction and quality assurance processes, which are considered to be essential factors in the mass transportation of passengers and freight. This has been implemented through development and use of what are known as the Standards.

Most of the design-type information comes from our Standards. When you look at Standards you have things like check-lists and software, they help you work your way through a design (Nick, engineer)

The Standards specify distances, design elements and allowances, and together with the design library, provide a comprehensive set of specifications, guidelines, requirements, design records and a design database that may be accessed to provide a starting point to inform all design tasks. In essence, they act as a repository which takes account of the lessons of TransportServices’ rail history and operations. They provide an essential knowledge resource and knowledge sharing mechanism that staff can access for guidance and problem solutions. So, the Standards establish specific directions regarding requirements and frame the enactment of TransportServices’ design and operational values. Accessible only to TransportServices’ staff, they are a means of preserving ‘organisational remembering,’ described by Feldman and Feldman (2006) as ‘collective, historically and culturally situated practice’ (p.880).

Nick describes the difference in approach between TransportServices’ experienced internal designers and external consultants:
Our older blokes here they take pride in what they do because they are railway men. With the consultants it is get it in, get it out, the design is within the barest of margins - if it falls apart in ten years its fine (Nick, engineer).

Use of the expression ‘they are railway men’ conveys more than expertise. It embodies commitment to: (a) industry, (b) their profession within rail, (c) the values that are important in rail operations (for instance, safe operation, excellence in design, construction, operation and service delivery); and (d) a passion for the world of rail. As Todd, an engineer, explains, “they love to be associated with this train thing.” Further, these workers are able to operate on the basis of accumulated rail and organisational knowledge:

They also know the history of proposed projects … projects and proposed stalled projects. They understand the operations, they don’t need to go to the operators and ask, they actually know what is done, they understand how the operations work. We have a team of railway surveyors within TransportServices who know exactly what things to pick up. They are specialist railway surveyors (Robert, engineer)

The number of people outside TransportServices’ employment with such knowledge is small. Consequently, poaching of TransportServices’ valuable workers by consulting firms occurs, resulting in the loss of valuable workers. This is a common practice in fields where expertise is sought after (Capelli, 2000; Wysocki, 2000): “People are being offered significant increases in pay to do work outside … the money was such that they couldn’t match that here and he left” (Cameron, design drafter)

Constrained by externally imposed public sector pay structures, it is difficult for TransportServices to match compensation packages being offered by external consultancy firms. Within the specialised rail domain, talented TransportServices workers receive employment offers from consultants, creating a potential for continuing knowledge leakage (Capelli, 2000). Indeed, one respondent described being approached and offered consulting
positions by consultancy firms when he attended a university careers exhibition for the purpose of recruiting graduate engineers for TransportServices.

In sum, in the case of both engineers and design drafters, the training received in their respective qualifications provides entry into the rail industry. However, development of their rail knowledge occurs on the job (i.e., in practice and in the context of their knowledge collective). TransportServices should, therefore, be understood as an environment in which knowledge is extremely contextualised and specifically constructed through its practice. Pre-entry training in the form of degrees and diplomas provides a basis for rail knowledge. Subsequently, this knowledge develops into a form of industry and organisational knowledge capability which allows workers to “draw distinctions in the processes of carrying out their work, in particular concrete contexts, by enacting sets of generalisations whose application depends on historically evolved collective understandings and experiences” (Tsoukas & Vladimirou, 2001).

Workers generate their own knowledge which is reinforced by perspectives from outside. So, the development of new and ongoing expertise in TransportServices is threatened by the loss of knowledge. It depends upon the knowledge sharing process to refresh, renew and sustain knowledge, to ensure future sustainability and achievement of its business strategy.

Drivers for Change

In recent years, rail authorities in other states have sold or outsourced their infrastructure and services, as described above. This has provided impetus for change in TransportServices, spearheaded by the previous long serving Chief Operating Officer (CEO)
and his recent replacement. At the organisational level, the key corporate goal of becoming the dominant rail operator has been established.

Gaining support for and realising such a core mission is premised upon effective knowledge sharing to maximise the advantage of the organisation’s past success and current capabilities. James (a manager) describes two key background factors. Firstly: “The Government was keen to see expansion of the (capital city) suburban rail network and upgrading of the network to meet the needs … throughout the Southeast ….” Passenger transportation is driven by regional population growth and requirements. It is a highly visible issue and the subject of parliamentary and media attention. In addition, James notes the second driving force:

The economics in China and India in particular – driving the world economy – the need for coal has increased dramatically and that has created a huge demand for the other significant part of our network – the coal network

This macro level environmental pressure establishes priorities for meeting the requirements of the national mining industry, international trading partners, federal government instrumentalities and the corporate business sector. So, at different levels, TransportServices is under pressure to expand its infrastructure in order to meet needs in two operational areas: (a) long haul, bulk coal freight and (b) mass passenger transportation. These goals serve as notice to other rail operators and to TransportServices employees, that rail is a changed environment and their basis for operating has changed. Respondents are, not surprisingly, aware of the organisation’s expansion plans to be a leading national rail provider. For example:

It demonstrates that TransportServices … has got a competitive nature, and also in going across the border you are inviting people to come back across this way as well .. it’s clearly demonstrating that we’re operating in an open market (Dennis, design drafter).
Dennis notes a fundamental shift in the organisation’s strategy and business direction, accompanied by a new business environment. The development of a competitive nature is new for many public sector organisations, which have traditionally operated on a centralised, bureaucratic model (O’Flynn, 2007). Now, they are attempting to become the market leader against private and other public sector organisations. The reasons for change reflect changes to the public sector environment (Parker & Bradley, 2000) which will be elaborated in the succeeding section.

Dennis further noted:

At the end of the day, it will more than likely be TransportServices and (Natrail). There is a third big player but anything could happen ... A third big player may buy out TransportServices coal and freight

New approaches, new expertise and ways of working are required. For instance, managing external consultants and their work involves: (a) a change in focus shifting from design work, (b) a change in perspective and responsibilities, and (c) the addition of new people and project management skills to workers’ existing technical expertise. Increasing regulation in regard to environmental issues, for example, requires current knowledge of many complex factors and their inter-relationship with the work carried out by participants. Development of this knowledge and its application to rail requires acquisition of knowledge of the relevant regulations and contextualisation to the rail application. This process generates new, specifically constructed knowledge for TransportServices’ benefit.

In summary, this section has presented and discussed the findings in relation to the drivers for change in TransportServices’ external environment. A major shift in this organisation’s direction and focus has originated from external pressures, including international coal transportation needs, government requirements and legislation, concern for environmental impact reduction and regional population growth. These changes have re-
focused the organisation’s business strategy, in turn re-shaping the nature and focus of the work area under dissertation. As a public sector organisation, TransportServices is subject to specific external and internal environment influences, requirements and pressures that do not apply to private sector organisations. In the following section, the influence of public sector organisation characteristics on workers’ knowledge sharing practices in TransportServices will be illustrated and discussed.

Influence of TransportServices’ Public Sector Environment

*Characteristics of TransportServices’ public sector environment*

TransportServices is a large public sector organisation. Its operations have been reframed by adoption of aspects of the New Public Management (NPM) approach (Hood, 1991), which has been influential internationally over the past decade.

The NPM proposes ‘downsizing, organisational disaggregation, managerial autonomy, greater competition, quasi-market mechanisms, public-private synergy, catalytic role, output controls, performance standards, concern for results, and responsiveness to customers’ (Haque, 2007, p. 180). It is underpinned by beliefs that private sector practices and processes are more efficient and customer focused than traditional bureaucracy (Rainey, 1998). Robert, an engineer with less than five years’ service with TransportServices, describes its impact in a day-to-day sense as:

… the conflicting obligations the organisation has of being effectively, supposedly, a private company owned by two shareholders – the Minister for Transport and the Treasurer, who is also the Minister for Infrastructure. Basically the Department of Transport owns it, through the two Ministers, and we are supposed to operate as a private company. And yet still retain so many of the limiting regulations that public companies spending public money has.
Under this regime, key performance standards identified by James (a manager) include “Return of investment … profit margin measures, increased of tonnage carried … cash flow….” The measures described by James reflect good business practice, but also reflect the influence of the NPM in highlighting profit margins, business growth and cash flows. Concern for results underpins the key performance standards described by James. Uniquely among respondents, James sees the organisation as creating its own direction: “I think it is TransportServices’s business strategy supported by Government, rather than Government policy” (James, manager)

This perspective proposes a strategic and operational independence for TransportServices, which allows it to define its own business strategy. It implies a process where government provides necessary support once TransportServices’ business strategy is approved. Overall, respondents demonstrate differing understandings of the role of government in relation to TransportServices, reflecting the ambivalence and inconsistencies of its complex environment. Another respondent, Robert, claims the government influences the direction of TransportServices: “The parts of TransportServices that are selling expertise and services is more to do with TransportServices being seen by its owners, the State, as more a business group” (Robert, engineer). Robert describes a relationship with the government in which TransportServices is framed as a business group where government direction adds an additional layer of complexity to its environment.

However, evidence of a second public sector paradigm, the Public Value approach, (Moore, 1995; Stoker, 2006) emerged among these TransportServices workers. This approach privileges the uniqueness of the public sector in creating not just economic value to the community (Heftetz & Warner, 2004), but also incorporates three key values: (a) services (e.g.
actual service delivery incorporating fairness, equity and associated values), (b) outcomes e.g. higher order considerations such as the national or a specific public interest), and (c) trust, legitimacy and confidence in government (Kelly, Mulgan & Muers, 2002). A summary and comparison of the new public management and public values frameworks is provided in Table 10.

<table>
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<th>Paradigms of public management</th>
<th>New Public Management</th>
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<td>Post-Competitive</td>
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<td><strong>Dominant focus</strong></td>
<td>Results</td>
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<td><strong>Managerial Goals</strong></td>
<td>Achieve agreed performance targets</td>
<td>Multiple goals including responding to citizen/user preferences, renewing mandate and trust through quality services, steering network</td>
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<tr>
<td><strong>Definition of the Public Interest</strong></td>
<td>Individual preference are aggregated</td>
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<td><strong>Performance Objective</strong></td>
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<tr>
<td><strong>Dominant Model of Accountability</strong></td>
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<td><strong>Preferred System of Delivery</strong></td>
<td>Private sector or tightly defined arms-length public agency</td>
<td>Menu of alternatives selected pragmatically</td>
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(Key, Mulgan & Muers, 2002; O’Flynn, 2005a; Stoker, 2006, as cited in O’Flynn, 2007, p. 261)

Key differences highlighted in Table 10 include the broader outcomes focus, pursuit of multiple goals and maintenance of trust in the Public Values framework. So, relationships are emphasised, compared with the emphasis on achievement of performance targets and results in the NPM. Further, responding to environmental complexity, the public value approach
requires managers in the public sector to “adapt and reposition their organizations in their political and task environments in addition to simply ensuring their continuity” (Moore, 1995, p. 55), as depicted in Table 10. Development of collaborative relationships through fostering trust, knowledge sharing, and tolerance for ambiguity are important for public sector managers in this approach (Broussine, 2003; Domberger & Fernandez, 1999; Entwhistle & Martin, 2005).

The services role of government is noted by Duncan (engineer). This requires TransportServices to provide passenger trains as a service to the public even though a financial loss is incurred: “we get Government support with that.” Hence, the government provides necessary financial support for the service delivery to the public. The outcomes value is demonstrated, (as noted earlier), in regard to provision of training: “government organisations…should have a social obligation to take on trainees” (Cameron, design drafter). Therefore, TransportServices meets its own needs, contributes to the broader public interest through expanding the rail industry knowledge and skills base, and provides employment opportunities for entrants to the profession of railway engineers.

Illustrating the overwhelmingly ‘political marketplace’ (O’Flynn, 2007) in which public sector organisations operate, funding for infrastructure (as described previously) has increased dramatically recently, after a prior period of low funding. Elaborating on the difference in outcomes required by private sector organisations and TransportServices, Nick (engineer) makes the following comparison:

Consultancy is pretty well bottom-lined driven. Whereas here, we still have our budgets and programs and the like. If you have to build a train line to (X-town) (and) you have to go $100 million over budget, you still have to build a train line to (X-town), that sort of thing. Whereas if you are a consultant and you go $10,000 over budget, someone cops it in the neck for that.
As Nick notes, within the Public Value model, TransportServices’ task of meeting passenger and freight rail requirements is its purpose and forms an over-arching imperative, creating an environment which differs from a purely commercial, results orientation. It reflects the traditional public sector focus on quality, service for the public interest and the community (Bradley & Parker, 2006). Nick’s example demonstrates that cost overruns which are unacceptable in the private enterprise environment must be accepted in a public sector environment, in order to deliver the required service for the public interest - for instance, to cater for a growing population and provide effective mass transport as a viable alternative to private car use.

Challenges arising from transport services’ public sector environment

Previously, it has been established that TransportServices’ public sector nature constitutes a highly structured, formally arranged behaviour setting comprising external, internal and psychological aspects (Barker, 1968). It is important to understand the complexes of factors in behaviour settings as they exercise strong coercive influence over the behaviour of individuals within them (Barker, 1968, p. 17). In a professional practice sense, most respondents describe their operational context as subject to: (a) considerable ambiguity, (b) shifting priorities, (c) changes in direction and (d) changes to task requirements, when working on government projects, for instance:

… the Ministers and the people who give us the funding because we don’t sell things, we basically get given funding to deliver things and we are to be somewhat accountable on the funding. So people tend to err on the protective side. Because we have that relationship we don’t operate like the private sector where you are given a task and you gotta deliver on that task, while here you’ve got this ongoing relationship which changes the tasks substantially from the beginning to the end (Todd, engineer)
Todd’s comments illustrate, firstly, the public service nature of the environment in terms of funding arrangements and public scrutiny of spending. However, these comments also illustrate the conservatism which that accountability generates. The development of conservative, bureaucratic attitudes has been associated with the replacement of organisational goals with rule observance (Merton, 1957). Emphasis on rule observance may impede knowledge generation, as experimentation with new ideas and innovations are thwarted by requirements to comply with existing rules and approved processes.

Conservatism may reduce managerial openness to divergent views and worker innovations and reduce worker willingness to spend time developing ideas which are unlikely to be adopted under current guidelines (Amabile, 1983). As a consequence of adaptation to the demands of sector protocols and processes, workers may become part of the structure of rules, procedures, and reporting requirements (Moynihan & Pandey, 2007).

Todd’s comments identify the ongoing and challenging nature of interactions due to the ownership of the organisation. For example, carrying out work projects for other government entities creates specific pressures and workload uncertainties. Todd illustrates how project costs can escalate through government clients altering task parameters:

They tell us ‘what if I investigate this, what if I investigate that’ and obviously when it comes to the end the cost is a lot higher because we have spent a lot of time mucking about and investigating alternatives in things that we probably shouldn’t be wasting time with. But that is the way it works. (Todd, engineer)

In this scenario, it is challenging for TransportServices to operate efficiently and to meet private sector standards (e.g. cost recovery for time spent), due to the time spent investigating and costing options to meet decision-making processes in other government entities. Conflict can also arise where other government departments have overall power over projects on which TransportServices is working, for example: “The developer would go
straight off to the Department of Transport and say ‘this is unrealistic, what are you going to
do about it’ and they would reverse our decision” (Robert, engineer).

This situation is described as leading to circumvention of the Standards and
compromising safety outcomes, a source of frustration for the TransportServices engineers
who feel that their values, knowledge and expertise are not respected for expedient, external,
politically-based reasons. Such feelings may act as a disincentive for knowledge workers who
take pride in their professional practice (Alvesson, 2004).

Further, political pressures or directions can influence the priority given to certain
works, rather than the professional judgement of the organisation. Henry describes a particular
incident:

There was something going on back up there – the member (of Parliament) up
there he doesn’t want anyone to know that the money is coming from him to make
the area look nice … we just concentrate on civil structures, design structures, so
we do not worry where that money come from. What we are doing (is) this, I will
make sure that our bridge will stand in the next 10 - 100 years time (Henry,
gineer, more than 20 years’ service).

As established in Chapter Two, such directions and projects may provide the politician
with public plaudits. Internally, however, they may reduce public sector workers’ motivation
and create perceptions of conflict between individual and communitarian, public good
interests. Where an organisational environment diminishes factors which foster commitment
and trust, the impact on knowledge sharing can be negative. This is because organisational
commitment and trust are necessary for knowledge sharing to occur (Bock, et al., 2005; Levin,
Whitener & Cross, 2006).

Malcolm (a design drafter with more than 20 years’ service) highlights the public
sector focus on design quality and service to the community, compared with the private sector
focus on cost reduction and efficiency (Bradley & Parker, 2006). Commenting on the
differences in approach between consultants and TransportServices’ workers, he observes: “They’ve got to do it as cheap as possible. Whereas we are looking at more of a broad view and longer term and a number of things like that. It is just the way it goes in nature.”

In essence, the public values framework takes a longer, broader perspective of providing a worthwhile service to the public, rather than a short-term, project based cost-recovery view. However, public sector approvals processes can be complex and conservative. Frustrations arising from public sector approvals processes were described by Duncan, (an engineer with more than 20 years’ experience):

The things that I don’t like, it is difficult to get access to overseas stuff or go overseas. I’ve managed to do one trip in my career to go over there… But these days, even if it costs you $10,000 for a three week trip, the information you can bring back can be millions of dollars of savings for the organisation. I find that frustrating that they don’t see that. Everything goes through the government, you’ve got to go to state government to go overseas (Duncan, engineer).

A conservative approach to initial investment in an overseas trip for this long-serving engineer does not account for the knowledge generating and expertise building outcomes which would result. In his view, the potential outcomes for the larger organisation would outweigh the initial investment. In this example, power relations exercised through the approvals process result in inhibitions to knowledge growth. This is because exposure to inter-organisational knowledge sharing and ideas has been associated with increased innovation and new organisational knowledge (Szulanski, 1996). Top management is reported to be less willing to manage knowledge than middle management which is closer to it (Deniz-Deniz & Zarraga-Oberty, 2004). Importantly, knowledge acquisition from external sources has been associated with improved performance, compared with habitual acquisition from local sources (Zellmer-Bruhn, 2003). For a long serving worker, such as Duncan, lack of opportunity to access new ideas in this way appears to be demotivating and disappointing.
In a similar vein, Derek, (a design drafter with more than 20 years’ experience), describes the difficulty of providing rewards for excellent workers, outside the normal compensation structure: “Red tape - millions of them. I mean it’s crazy. I mean if you were in a private firm, I’m sure that they would recognise that person even with a bonus or whatever. There’s no way you can do it here.”

Red tape (e.g. rules, regulations and procedures) has been associated with increased compliance burden and reduced effectiveness (Bozeman, 2000). Derek reports that public sector compensation rules and procedures do not provide individual performance-based rewards. Attempts to vary pay by such measures are hampered by regulations (‘red tape’). Emphasis on compliance requirements may negatively affect freedom to innovate and generate new knowledge. Agreeing with Derek, Nick comments:

But at the moment with large amount of works and demand – if you are looking for dollars you would go for a consultancy or you would look overseas … Government agencies are hamstrung a little bit. We’re on distinct pay scales, for example … what they call the PO Pay Scale. Once you get to 3.3 there is no automatic progression, there is no latitude for performance-based pay rises (Nick, engineer, 10-20 years’ service).

Nick notes the lack of flexibility and the potential for knowledge leakage it creates. For knowledgeable workers, superior opportunities exist with consultancy and overseas employment opportunities. With no latitude for individual salary arrangements, the organisation is vulnerable to knowledge leakage if valuable workers become dissatisfied. However, reduction of red tape has been associated with positive effects upon employee motivation (Moynihan & Pandey, 2007).

In sum, TransportServices’ public sector environment creates both opportunities and constraints which require its workers to adapt and understand how to be effective. This involves construction of contextualised knowledge and skills in relation to their specific
environment. For instance, James (a manager) describes his management task: “Everything I do is about, you know, making things work … It’s not about breaking the rules but it’s just about making things happen. This is all about finding a way.”

The workplace environment in this investigation provides powerful reinforcement and challenges which affirm workers’ public service values and commitment to their professional values. It also creates frustration through regulation and conservatism which have the potential to negatively impact upon organisational knowledge.

Contribution of the Engineering and Design Drafting Areas

The specific purpose of the areas is described as the delivery of engineering skills and knowledge by Nick (“The core value is to deliver engineering expertise to the overall organisation”), and Barry (“to produce technical designs and provide advice for works related to the infrastructure of the railway”). These are achieved through the development of designs for rail infrastructure projects, and ongoing advice to the organisational divisions which operate the rail network.

TransportServices has deep, specialised and extensive knowledge about everything to do with rail. We are at the forefront in rail …. We carry out consulting projects in Asia and other places. Because other … state rail authorities have outsourced their engineering and design, the knowledge in this area is unique and closely held. We’re not here to provide training for the commercial world when the knowledge has been developed and built up by TransportServices people in TransportServices time and paid for by TransportServices. We’re proud that our CEO at the time when the other states’ rail authorities decided to outsource, had the vision to keep an in-house design and engineering facility. So now TransportServices is going from strength to strength and the other rail authorities are struggling (Joe, design drafter).

Joe, a design drafter with more than 20 years’ experience, describes TransportServices as the leading national rail operator whose expertise is unique and sought after. He believes
that the work of his area is highly valued by senior management, as demonstrated by the area’s retention, and that it is integral to TransportServices’ success. In comparison, other state rail operators have closed their engineering and design areas. An undesirable outcome associated with dismantling public agencies, increased use of contractors and downsizing is the loss of valuable knowledge (OECD, 2005).

Consequently, the knowledge and skills constructed in and by this group are viewed by Joe as unique in the national rail industry and constitute, in his opinion, intellectual property belonging to TransportServices. Joe identifies the group’s knowledge as locally constructed (Wenger & Snyder, 2000), situated within the group and the organisation’s practices (Richter, 1998), which together form a site of learning for competitive advantage (Bognor & Bansal, 2007; Nahapiet & Ghosal, 1998).

We’re civil engineering design section, we design all the infrastructure for TransportServices all over the state, and that’s virtually everything below the ballast line, …, the earth works, the drainage, the bridges, retaining walls, fuelling installations … any stabling requirements for trains, sheds … so it’s all civil engineering work for TransportServices (Derek, design drafter).

Derek describes the range of design problem solving challenges which the group addresses. The range of tasks and situations presents both standard situations and unusual combinations of elements and construction problems. With more than 20 years’ service, Derek is familiar with projects for which there are many unknowns and where the specifications may change during the design process. Dealing with ambiguity - common to the work of professionals (Alvesson, 2004) - is a regular occurrence.

For Tom, the focus is safety (“required to ensure that it is a safe form of transport”). Like Nick, Barry and Tom, Ed is an engineer. He has less than five years’ experience with TransportServices, having previously worked as an engineer for another organisation. He describes the area’s contribution to the organisation at a different level:
Track Engineering is the intellectual division you might want to say. Track Engineering produces intellectual information, designs of track. We do research into to better improve what the railway is running. We also look at many special cases (Ed, trainee)

This description of the section’s purpose and contribution focuses on the unique, inimitable intellectual contribution provided by the area’s collective expertise. Similarly, in the dissertation’s preliminary briefing, James (a manager) states that ‘this area provides the intellectual grunt’ for TransportServices. He highlights the specialised, adapted, design knowledge which has been developed over time. It is described by William, (an engineer) as ‘our expertise in the last 100 years,’ across a wide range of different engineering challenges.

Joe notes:

They use us as a sounding-board for the knowledge of what’s required and standards of what needs to be built, what you are going to build things to and look after the construction of the actual jobs as well (Joe, design drafter)

Further emphasising the intellectual role of the area, Joe notes its relationship with the Network Access Group (responsible for operating the overall rail network) describing the design outcomes as “considered to be TransportServices’ intellectual property.” The nature of this area’s contribution, therefore, represents an example of the development of unique capabilities, based upon the inimitability of its processes, capabilities, outputs and practices (Kogut & Zander, 1996). As observed by Barry, (engineer):

We’re the only in-house design group in the rail system anywhere in the State, in Australia. Even overseas I don’t think other rail authorities have in-house design groups, it’s all externalised, goes to consultants (Barry, engineer).

Thus, the maintenance of this group by the Chief Executive Officer has ensured that TransportServices nourishes and supports a feature which contributes to its competitive advantage and hence, its sustainability (Bogner & Bansal, 2007). Achieving maximum organisational effectiveness and strategic goals is difficult to accomplish without the
necessary intellectual capital (Stewart, 1997). The ability to critique current ways and develop improvements results in knowledge generation and environment which may foster innovation. These arise from the contextually constructed knowledge and socially situated practices of the expert groups of engineers and design drafters (Alvesson, 2004; Cockburn et al., 2000).

Organisational patterns establish powerful influence over workers who enter and work within them. The organisational behaviour setting creates the standing patterns of behaviour (Barker, 1968) for these engineers and paraprofessionals, i.e. the characteristics and ways of acting in this organisation that shape the practices of individual workers. The patterns are observable, in this instance, through: (a) the purpose of the organisation and work areas, and (b) the contribution expected by the organisation through maintaining the engineering and design drafting functional units. The purpose of these areas is the provision of specialised rail engineering and design drafting expertise at the highest level to serve the needs of TransportServices’ customers. The contribution is established through the unique knowledge and personnel resource their expertise supplies the organisation, a knowledge repository that thereby advances its sustainability (Spender, 1996b).

Outsourcing to External Consultants

The use of consultants now requires the management of knowledge to extend beyond the organisation itself. The growth in outsourcing work to external engineering and design drafting consultants emerges as a contentious issue in TransportServices. As previously noted by James, (a manager) use of outsourcing is part of a multi-method approach to allow this area to service the rapid expansion of infrastructure design demands:

We are using a whole range of mechanisms to do that, in particularly, use of consultants … we’ve had a huge expansion of workload and we’ve had to
outsource huge amounts of work and we’ve had to ask people to take more on the role of managing the outsourced work and reviewing the work. And there is some assumption here that managing the outsourced you might be able to do ten-times as much outsourced work than you can do yourself in-house and review their work.

James takes a broader, management perspective where use of consultants facilitates achievement of organisational requirements. In his view, the strategy of consultant use provides additional knowledge resources to complete the area’s workload and undertake the recently expanded work program. He describes a reframing and perspective shift for the workers in the area, from personally carrying out the work, to now managing the work process through the use of consultants. He believes greater efficiencies will result and that the workers will be able to step back to a review role.

Other respondents, however, describe multiple impacts of outsourcing. Malcolm (a design drafter with more than 20 years’ experience), notes problems with work carried out by consultants: “… is not quite up to standard … it takes up a lot of time. More time supervising consultants than what it is supervising experienced people in here” (Malcolm)

Delivery of incomplete, late or substandard work by consultants causes discontinuities or breakdowns in workplace activities. Through internal knowledge construction processes, TransportServices’ workers learn to act in accordance with organisational routines (Patriotta, 2004) which were not understood by consultants. Barry (with more than 20 years’ service) comments on work problems arising from use of consultants:

The dilemma is that you then get in from the consultant and you’ve got to check it. You find things they overlooked. Like three or four jobs at the moment where there is quite critical things that need to be built and built by other authorities, before we can do our work. Normally when you’re doing those things yourself, they are the first things you put in train … The consultants are sort of leaving that in limbo, not perhaps having ownership of it, they don’t fully appreciate that it delays the whole friggin’ project. They should have put that forward earlier, but that is real life. We can’t do the job, but then we get hammered if the consultants are late or if it’s an inferior product. People can say ‘well the consultant-base is done why are you checking’? You have this dilemma. (Barry, engineer)
Barry possesses a deep level of knowledge about organisational systems and his engineering field, and is identified by several other respondents as highly valuable to the organisation. Barry and his colleagues experience frustration, additional work, questioning by others and delays caused by the consultants’ lack of situated knowledge.

In describing his frustration caused by errors and omissions in consultants’ work, Barry identifies an underlying issue inherent in knowledge constructed within a specific social context. Organisational processes contain both obvious processes and protocols, and embedded systems and processes (Haynes, 2005). For instance, engineers within TransportServices are aware of workflow sequences impacting on the throughput of work to be completed by associated areas or authorities. Therefore, this knowledge is embedded within the workplace procedures and modus operandi of TransportServices’ engineers. It is something they ‘know’ and account for in their work practices. This practical knowledge (i.e. knowledge of organisational processes and work flow and its effects on other segments of the work sequence) is deeply associated with its socially situated work context. It is contextually constructed knowledge.

In essence, ‘working knowledge is local’ (Fenwick, 2001, p. 10). Discontinuities produce a positive outcome in Patriotta’s (2004) view: ‘breakdowns’ of this nature permit identification of ‘the organizational devices designed to anticipate them’ (p. 9). Increased outsourcing, use of consultants and the specialised nature of rail engineering may make such ‘breakdowns’ more frequent. In a more strategic sense, however, review of these discontinuities can create opportunities for workers and supervisors to achieve improved service delivery through reviewing the organisational routines, reaching agreement on future
actions, and communicating the procedural requirements to the consultants to (Zellmer-Bruhn, 2003).

Consultants sometimes ask for access to TransportServices designs and standard plans or specifications. This is considered to be TransportServices intellectual property and closely held. Consultants’ requests are referred to higher management for a decision. They are given what they need for the specific job. It’s because there is no real training course for rail knowledge (Joe, design drafter).

It’s a pretty tight industry and people know what goes on. You do have to be more careful when dealing with outside companies of how much you let them know. (Duncan, engineer)

These respondents are concerned to protect the hard-won specialised knowledge developed over time, success, failure and commitment to TransportServices by their colleagues and predecessors. They are aware of the value of their intellectual capital to external parties. They are also aware of the advantage which might be gained in relation to future contracting processes by ad hoc distribution of information to consultants in their small, specialised field of knowledge and practice.

Previous research has established that from the knowledge sharing perspective, the organisation’s legal definition is less relevant than the community of practice within which the organisation’s knowledge flows freely (Becker, 2001). In the case of TransportServices, contracts with consultants are frequently renewed, and individual consultants are recruited to join the organisation’s permanent workforce due to their demonstrated knowledge and value. However, in its home state, this knowledge collective tends to reflect the organisational boundaries of TransportServices with the addition of long-term or frequently used contractors. This is due to the specialised nature of rail, competitive nature of the marketplace and the small number of rail operators.

In addition, the predominant age range of workers in the areas in question at the commencement of the investigation was 45 to 55 years of age. As Todd notes: “It’s only
recently TransportServices has started opening their doors to more external people because there’s not enough people around. Everyone’s retiring” (Todd, engineer)

Todd highlights the impact of the age range upon the area’s ability to maintain its knowledge base and service its workload in the light of the dramatic increase of work projects. Past recruitment of new engineers has been reactive and based upon filling vacancies rather than upon growth and development. As more workers retire, the area’s knowledge will be diminished. The development time to equip new trainees creates a gap in expertise and capacity which James (a manager) hopes consultants will fill, while simultaneously adding management skills to the engineers’ roles:

I wanted my people to be the people doing the outsourcing - seen as their model for helping them out. I don’t think they think that because of all the workload. But conceptually I thought it was a better view … working for the people and not competing. They still see it as a bad thing sometimes because they are training the consultants and all that (James).

He describes a scenario in which the consultants are working for the engineers and design drafters rather than competing for their jobs. In this scenario, the consultants are a resource to assist the group, not an alternative, external source of the knowledge and skills they possess. Due to the heavy workload, however, the engineers and design drafters must spend time training the consultants and conducting detailed reviews of their work. Thus, they have little time to manage the consultants as they are too involved at an operational level. As Nick indicates, not all staff agree:

If everything becomes outsourced all you become is a consultant manager. We’ll lose our biggest asset and we market ourselves as rail expertise and design of rail facilities and the one thing that we can make that’s a difference, we will lose that over time (Nick, engineer).

While Nick appears to understand the proposed model and the role of consultant manager, he claims it will result in gradual loss of the special knowledge and expertise built
up in the area. He believes the outcome to be loss of the unique difference which forms the competitive edge underpinning TransportServices’ success.

In summary, the characteristics of TransportServices’ history and success have created socially constructed and situated knowledge. This is constituted by understandings, practices and behaviours which are particular to TransportServices, which are consciously held and valued, and reinforced by its operational and competitive success. As such, this knowledge has played a key role in the organisation’s development and operations. Respect for this knowledge reservoir creates a knowledge sharing orientation and practice within the organisation. Currently, discontinuities appear to exist between the approaches of the senior manager and the workers. The senior manager advocates knowledge sharing with the broader profession beyond the formal organisational boundaries. However, a conservative attitude exists among the professionals and paraprofessionals, who view such sharing with external parties as diminishing TransportServices’ intellectual capital, and hence, competitiveness.

In the following section, data describing the influence of the organisation’s structure and control mechanisms is presented and discussed. As discussed in Chapter Two, the mechanisms and enactment of organisational control systems established within the organisation’s structural arrangements create the environment for work processes and interpersonal relations to occur. These control mechanisms regulate vertical, horizontal and task interactions. They establish reporting relationships and create formal communication flows, in response to which informal communication develops. Knowledge generation and sharing practices are in turn, facilitated or discouraged by the arrangements by which an organisation structures and directs its operations and workers.
Influence of the Organisation’s Structure and Control Mechanisms

An organisation’s organising principles frame the structure, coordination and communication processes through which individuals cooperate, thereby mediating its capacity for knowledge generation and sharing (Connor & Prahalad, 1996; Nahapiet & Ghosal, 1998). Structural aspects include design and grouping of jobs, delineation of authority, and reporting relationships (Lawrence et al., 2005). Knowledge flows are, therefore, influenced by parameters of defined job responsibilities and groupings of co-workers. In this section, data illustrating the influence of the organisation’s structure and control mechanisms on the worker’s perceptions of their experienced internal organisational environment are presented and discussed.

A range of perspectives and beliefs about the organising structure emerge when respondents describe their view of the organisational structure as they experience its influence in their work tasks (Klein & Myers, 1999). Dennis, a design drafter, describes the structure in the area:

We’ve got a manager. Underneath that to execute that role he has broken it up into five different streams, natural streams I suppose you could say. I manage one of those streams. Below that then I have set up a number of supervisors that run little work units, specialise in particular areas. I’ve got eight supervisors. Then they’ll have staff ranging from say five staff down to just working by themselves but sourcing staff when they need them. Seems to work pretty well.

Suggesting that it is a ‘traditional structure,’ Dennis describes a hierarchical structure which groups workers based on functional lines, supplemented by specialist workers when required. Hierarchical structures have been associated with consistency and accountability in management of complex activities (Jaques, 1990; Moynihan & Pandey, 2007). However, they have also been associated with reduced horizontal knowledge sharing through the dominance
of the manager’s role in directing information flows (Hedlund, 1994). In Nick’s area, project work is managed through a matrix structure (Deniz-Deniz & Zarraga-Oberty, 2004):

Here it’s slightly different where you have the Contracts Section who look after contract admin, there are Site Engineers who look after the site. If it’s a bigger project, you’ll have someone from Projects running it as a Project Manager … you’re manager for your small part of the project. You probably just look after the design, the design part of the job and then you would hand it over to Contracts or you would have it over to Site or you’d flick everything back to the Project Manager (Nick, engineer).

Nick describes a structure based upon project teams, where workers with the various specialist knowledge and skills required by the project are formed into project teams managed by a project manager. Matrix structures using project teams in this way have been associated with improved knowledge sharing and communication as expertise is shared during project completion (Deniz-Deniz & Zarraga-Oberty, 2004). Use of project teams also facilitates interactions between workers who do not otherwise collaborate, creating opportunities for within and between group knowledge sharing (Argote, McEvily & Reagans, 2003).

The roles of project managers and team members are elaborated by Barry:

There’s pressure on business groups to save money when they’re operational … But our project managers are more monitoring our performance in the project, the budget and talking to the client. …Our interfaces are directly with clients and people in the other business group. It’s only when priorities are meant to be established or shit happens, the higher authorities get involved. (Barry, engineer)

Barry’s comments indicate that the specialists who comprise the project team have considerable autonomy to perform their tasks and interact with clients and other TransportServices areas. Autonomy and authority to act are based upon demonstrated technical capabilities, relationship and task management skills and indicate trust. This is because outcome controls may be used. Outcome controls focus on specifying required task outcomes but also allow workers discretion to choose the method or process of task achievement (Turner & Makhija, 2006). These controls foster innovation and hence, are
appropriate where innovation and knowledge generation is desired. James (a manager) observes that delegation of authority also reflects the manager’s approach:

They have authority to deal with things and those are the people you deal with. It does have its downsides too because it’s assumed that those people you deal with have the devolved authority to deal with things and if their bosses don’t agree, or they may have devolved that authority but they can still disagree.

James suggests that direct communication occurs with workers responsible for tasks (‘things’), and asserts authority is devolved together with responsibility. In practice, as James has indicated, the senior manager can disagree with a worker’s decision. For instance, Cameron describes the process from a non-management perspective:

Basically you’re making decisions on a daily basis. Which is wonderful. … The only frustrating thing with that, you take the decisions, you make those decisions but you don’t have the support of those decisions. It’s a bit like me saying to you … OK I’ll leave that up to you, you can make a decision which ever way you go. You start making decisions and they may be, from my perspective, incorrect. The thing is, because there’s nothing in place to allow you to converse with me again, that’s where it goes wrong (Cameron, design drafter).

Cameron suggests that a monitoring or review process would provide additional opportunities for discussion. Such discussions may enable knowledge sharing between the more knowledgeable manager and less knowledgeable worker. Monitoring and supporting staff performance is a key management role. Conflict or ambiguity regarding management’s expectations of job role practice and behaviours has been associated with reduced job satisfaction (Gerstner & Day, 1997). Further, James (a manager) nominates management’s responsibility: “Another definition I think of management and supervisors is to be able to absorb uncertainty and I think that’s the role, probably one of the key roles a manager or supervisor can do for people” (James).

In James’s view, managers can absorb uncertainty and provide their staff with clarity (Alvesson, 2004). Most respondents indicated that their supervisor is the source of
clarification when they are uncertain about a situation. For instance, Tom, an engineer who is himself a supervisor, notes: “…unsure about what to do … I ask the supervisor – I work through the issues with the Supervisor” (Tom, engineer).

Tom’s comments demonstrate the traditional reporting relationship between manager and staff member in establishing task requirements and outcomes. Communication flows can support or discourage autonomy in work settings. Tom provides an example of the communication protocols applied to communication with external consultants:

The way the request comes it might come down through the manager, the new principal engineer to myself, who might get the graduate to find out the information, but he wouldn’t be sending the information straight back (to) the consultant. An email comes back either to me, from me to the principal engineer saying this is our advice, and it’s up to him to pass on that, or I might act on behalf of the principal engineer. If I’m confident it’s the right information I’d send that out.

As expected with projects of considerable construction and financial importance, this communication process passes through several approval and recording levels, thereby providing an audit trail, a standard business practice. However, day-to-day communication is less formal:

Most of the time people just talk to people who they know or think might be able to help them regardless of the structure and nobody says ‘I can’t talk to you because I’m in (a different section) ’ (Barry).

Managers described barriers to information in relation to financial matters. The following three managers indicate their frustration:

I don’t have financial information on our part of the business and I don’t get very much information on how our group is performing financially, and then TransportServices as a whole. And I find that quite surprising that information is not sent down to the manager level – to my level… I said to my people ‘we don’t understand what the real drivers are here’ (Dennis, manager).

Some of our financial recording systems are worse than they used to be several years ago (James, manager).
Information about our costs, financial accounting stuff is just hopeless (Barry, supervisor)

As members of the management group, Dennis, James and Barry convey their expectations that they should receive information which would assist their decision-making and financial planning for their own areas and projects, and enhance their understanding of the larger organisation’s progress. For Dennis, understanding about the most important business imperatives (‘the real drivers’) would be valued. For Barry, understanding of the cost structure (‘information about our costs’) would assist. Restricting information flow to workers’ specific task requirements is an example of a process or bureaucratic control (Turner & Makhija, 2006). Process controls include standard operating procedures, for instance:

This guy argued with me last week to say that I had no chance’ … within a week it comes back, a response that say ‘well, you’ve got to build a case’. And I said ‘what does that mean’. Oh no, there’s a form here. Everything is forms. It was done in another week, bang it happened. Two weeks earlier it was impossible to do it … You’ve got to find out which form you need to do, which review you need to do, which kind of risk assessment you need to do, and then you put it in motion and hopefully something better will come at the end (Todd, engineer)

In this instance, Todd (also a manager) is required to comply with standard approvals processes to develop a new idea, thereby demonstrating process controls in operation. Process controls are designed to reinforce organisations’ structural arrangements, but can impede knowledge sharing and reduce workers’ ability to innovate and generate alternative ways. Mechanisms that hinder emergence of differing perspectives have been shown to reduce knowledge generation (von Krogh et al., 2000).

During the course of the study, changes in the organisational structure and staffing arrangements for the groups under investigation were introduced. Discontinuous change which emphasises planning, structure, management control and identified goals is identified as deliberate change (Treleaven & Sykes, 2005). James describes the impetus for the changes:
… trying to re-establish those key performance indicators… business was not
focused on consulting, it was focused (on) the performance of the asset. So now
there is a realisation … at least with us it is, we can’t afford not to have those
indicators… We are still an engineering business and we need those certain
indicators to manage what we are doing

These comments indicate a renewed focus on performance and task outcomes for the
purpose of better managing the area’s work and its workers. The nature of the changes is
elaborated by James:

we’ve sought to change from a couple of functional roles … (a design area, a
standards area and a contracts area – a functional arrangement) … split them up
and got two portfolio areas, one looking after the suburban-type of infrastructure
and one looking after structural issues and design issues, not design but structural,
civil structures … So a re-cutting of the pie

These changes altered the supervision, work groups and physical location of some
engineers and design drafters. Consequently, for those workers, these are significant changes.
Respondents described a range of responses to the new arrangements:

People are not real happy … they failed to sell the change, the re-structure, to
justify the need for it. So that was probably the biggest mistake and that has been
discussed recently and it’s been acknowledged that some of them didn’t go out of
their way to explain to anyone why it was happening. And people don’t see it
working any better as it is … they split an area into two … they split several areas
into two and people just can’t see what they’ve achieved at the end of the day
(Cameron, design drafter).

In Cameron’s view, the communication of the process and expected outcomes of the
changes was inadequate. Barry reports feelings of job insecurity:

Like I say, sometimes you worry about it, sometimes you don’t. You get on day to
day, that’s all you do. Our boss said just do what you’re doing now and if we keep
doing what we’re doing now they’ll keep us and if we don’t, they won’t. We
won’t be here … We’re the only in-house design group in the rail system anywhere
in the State, in (the country) (Barry, engineer).

Henry has experienced changes in supervision and work group, but his job tasks and
role remain similar: “This is the structure now … what we do is more or less the same, but
reporting is to a different group now” (Henry, engineer).
Commenting on the “recutting of the pie” (James), Cameron notes that the re-structuring has placed certain functions associated with the Standards in each new group. These functions provide advice and interpret requirements for enquirers. On a pessimistic note, Cameron suggests duplication and a resultant potential for inconsistencies:

What you are finding now is that the bits that have broken and formed into this thing over here, and this guy is going to advise this group over here of Standards and clearances and other bits and pieces. Just the same as we have another group over here. This young lady over here is going to be addressing it. Now what he says and what she says, is going to be two completely different things (Cameron, design drafter).

For Henry, there has been a values shift. Describing the increasing focus on productivity, Henry (engineer) notes:

in the olden days … we always insisted the bridge should be designed for 100 years life, but not this, it depends on the clients … if it is not 100 years, I want the bridge designed for 20 years. Because designing bridges for 10-20 years life is a lot cheaper than 100 years … because the life of that track is assumed to be around 20 years, because the coal might run out by then, there is no point in designing the track or bridge for 100 years if there is no coal any more (Henry, engineer).

He describes a more pragmatic focus on meeting actual end-user requirements rather than an idealised overall goal, leading to a more cost-effective outcome for TransportServices and the client. Malcolm, (design drafter, more than 20 years’ length of service) takes a macro-level view of the reasons for change as improving coordination and management:

Probably to get the best out of the operations so that it improves operations of it. Manage means the existing stuff as well as the new stuff. Assisting other people managing it, so it is not solely where we are only part of the bigger picture, so we have to try and think of every other part of the organisation. It’s the best management.

Similarly, Derek represents the outcomes of the changes in terms of management and coordination: “It will be like a project management group. … and they’ll project manage or respond to the client, you know, coordinate all the projects” (Derek, design drafter).
Duncan reports a positive outcome from the changes - he has been moved to a different work group:

It is generally pretty good. We are now in the part of the organisation that spends the money, or rather has the money to spend, so we don’t have to penny-pinch as much. So I think it has been pretty positive … The processes have changed, the process of how we do work and get work has changed (Duncan, engineer).

Speculating on the rationale for the changes, Barry suggests pressure from TransportServices’ owner to achieve better performance: “It’s also pressure from government to have a certain rate of return from Treasury or some rubbish” (Barry, engineer).

Barry suggests the organisation’s changed business strategy is in part derived from pressure from the Treasury Department. Barry’s final words (‘or some rubbish’) may be interpreted as indicating the presence of employee cynicism. Employee cynicism has been associated with employee burnout, suspicion, reduced affective commitment and the development of alienation (Andersson, 1996; Dean et al., 1998). Employee cynicism, therefore, may have negative implications for knowledge generation and sharing. In an environment which has undergone such a fundamental shift in its operational paradigm, (i.e. from a service provision to a highly competitive, growth-focused operation), workers in TransportServices have experienced ambiguity and discontinuity in the purpose, values and goals of their organisational setting.

The growth of workload is being met through extensive use of outsourcing (“…letting out probably 80% of our design work to consultancies,” James) and some vacancies have not been filled. Employee cynicism has been associated with high work demands, evidence of increasing outsourcing, and organisational restructuring programs (Allen et al., 2001; Hellgren, Sverke & Isaksson, 1999; Netterstrom & Hansen, 2000). Summing up the impact, James opines:
I find that they’re demoralising, not re-energising, they demoralise in general. I think everyone goes … through all those classic examples of any sort of change process like a grieving process or whatever, you go through a sense of loss and blame and all those sorts of things so it’s no different for an organisation, in my view. Eventually you get acceptance by the organisation and then you’re into building on that so it’s just a process that happens.

He notes that initial reaction to change may be lack of acceptance and desire for return to the past ways, but eventually acceptance of change and the momentum of ongoing projects and work tasks result in a process of building upon the new ways. He describes a common reaction to introduced organisational change (Piderit, 2000; Tsoukas & Chia, 2002).

In sum, the organisation comprises a number of separate, distinct sites of socially constructed practice characterised by different types of professional practice. The focus of each group is its business unit or function. The organising principles mean that work activities are sub-divided and separated along business unit or functional lines – requiring, based on and developing specific expertise, for example, engineering and design drafting. Each group is characterised by three common features of socially constructed practice: common knowledge and practices, shared sense of identity and common elements of work related values (Brown & Duguid, 1991; Hislop, 2003b).

Organisational change processes introduced by the senior manager within these groups demonstrate some features common to all organisations undergoing change. For instance, top-down change processes can be rendered ineffective by lack of action at local levels (Brooks & Bate, 1994). Lack of action at local levels can, in turn, be explained by the ways in which disconnections occur between frames of meaning at different organisational levels and within different groups over time, consequently, change outcomes are influenced by the relationships between frames of meaning (Pope et al., 2006).
The importance of managers for knowledge sharing has been identified by Nonaka & Takeushi (1995), through managers’ upward and downward influencing capacity. The role of middle managers is important in knowledge sharing, as perceptions of management support for knowledge sharing have been associated with workers’ knowledge sharing orientations (Bock et al., 2005). Such perceptions are important because they guide workers’ orientations for action and their knowledge sharing practices. Managers enact the organising principles and control processes of the organisation, thereby creating support for new ideas and knowledge sharing interactions between co-workers. However, the organising and control processes which establish how individual workers are grouped, tasks are distributed, processes are to be carried out and who can talk to whom, create an environment of complex sets of factors that will impede or foster innovation and knowledge sharing practices on a day-to-day level (Beech et al., 2002).

Impact of Work Demands

Pressure of work demands can prevent social interactions with colleagues in other parts of the organisation who possess some acquaintance with the work tasks, thereby reducing exposure to diverse and potentially knowledgeable perspectives (Cohen & Levinthal, 1990; Perry-Smith & Shalley, 2003). The introduction of reforms in public sector organisations has, in some cases, resulted in both increased workloads and reduced resources (Brunetto & Farr-Wharton, 2006). In addition, public sector organisations such as TransportServices are dependent for funding upon the policies and actions of the government of the day. As a result of government priorities, funding may be generally provided but also directed towards or away from specific areas such as infrastructure. Thus, in periods when
infrastructure provision is not a key priority for government, funding may be directed towards other projects.

TransportServices has experienced fluctuations in infrastructure funding in recent years and is now in a period of heavy demand:

We are very much at the moment driven by the capital program. The capital program a few years ago was $300 million … and we are now talking about a billion dollars. That is a three-fold increase. Our maintenance level spend is about $300 million, so … that is putting things in perspective at the moment. Because of this huge expansion in the capital, the low rail capital, a huge effort is going into delivery on that. Enormous, enormous demand on us to increase infrastructure (James).

James, (a manager) describes a dramatic injection of funds and a corresponding increase in work output expectations from government. Pressure to deliver numerous design projects quickly to increase infrastructure construction is resulting in extremely heavy workloads for the work areas involved in this investigation. This pressure has resulted in changes to traditional approaches, changes in work roles and new ways of working, according to the same manager: “The key has been the whole combination of measures – in-house and out-house, and changing our in-house role from pure design to manage the consultants as well as doing pure design” (James).

For James, a strategy of using external resources under the management of TransportServices’ in-house experts represents a combination of resources and roles which will maximise use of the internal resources. Oversight of consultants’ work by the TransportServices’ design professionals is anticipated to provide knowledgeable supervision and monitoring by rail specialists, ensuring any errors or inadequacies are identified. The pressure of work is described by Malcolm and Dennis:

We can’t do all the work ourselves. We’re sub-letting a lot of it out or the majority of it out to consultants to do the job (Malcolm, design drafter).
The amount of project work has increased dramatically, absolutely dramatically, probably close to five-fold … We let a lot of work out in the last 2½ years to consultants and … we knew it was going to be difficult and it has been extremely difficult because they do not have the same sort of capability we’ve got here. (Dennis, design drafter)

For Malcolm and Dennis, the impact of the increased workload appears almost overwhelming. As described previously, the consultants do not have the specialised knowledge and skills that the in-house staff have built over time:

We’ve got mad panic … I’ve been doing 10 hour days, average 4 a week, plus another day long hours very much the same, a 9 hour day or something like that, half of us actually come in on the weekend and do some work on the weekend too (Angus, design drafter).

Angus describes the impact of the increased workload on his work schedule. In addition, however, Malcolm reports disquiet at management’s failure to replace staff who have left:

It is very hard the workload that we’ve got on at the moment to keep on top of things. It just seems that the organisation doesn’t seem to be filling those vacancies and sort of having a snowball effect with morale and that sort of thing with the other people who are still left there … I think it has come the time when they need to show faith in the workers on the floor and show that they are doing something (Malcolm).

Malcolm is a supervisor with more than 20 years’ service with TransportServices. He is concerned that morale is suffering due to the work demands and reduced staff levels. He further notes concern that failure to replace staff indicates lack of faith in the area, reflecting disquiet regarding use of consultants and job insecurity: “Our senior people do the best they can but they are under extreme pressures” (James, manager)

Overall, therefore, management and workers alike are under pressure in the engineering and design area at TransportServices during the period of this investigation. The workload is intense, a new approach to workload management has been introduced, incorporating the use of external resources. However, while management sees this as
supportive, there is evidence of disquiet at worker level that these external resources will supplant the internal expertise. Increasing the levels of disquiet is the organisation’s failure to replace staff who have exited.

Pressure of work requirements has been associated with reduced intrinsic motivation (Amabile, 1983) and time available for idea generation and problem solving (Mumford, 2000). Where workers perceive that the organisation’s focus is on task requirements and deadlines rather than creative effort, there is reduced opportunity for creativity and reflection (Perry-Smith, 2006) necessary for knowledge generation (Mumford, 2000).

Conclusion

This chapter has identified the sets of macro-level factors arising from the organisation’s complexity, which mediate relations between organisations and their workers, and the relations among workers, thereby influencing individual knowledge generation and sharing orientation and practice.

It has presented and discussed the dissertation’s findings related to the influence of TransportServices’ environmental complexity upon knowledge generation and sharing, including factors external and internal to the organisation. This is important as the environmental complexity is considered to create the setting for interactions which shape workers’ beliefs about what is important, valued and experienced. Extending and further elaborating the a priori constructs presented in Chapter Two (consistent with the study’s social constructivist approach), Figure 6 illustrates and summarises the macro-level influences manifested in this dissertation.
The macro-level factors summarised in Figure 6 were found to constitute the complex nature of the macro-level environment within which workers function and knowledge generation and sharing are expected to occur. First, the mission and business goals of TransportServices are directed towards its ability to outperform its competitors. Across the range of respondents’ hierarchical levels, service periods and job roles, workers demonstrated inter-subjectivity of purpose within this strategy. This is important: shared understanding of the goal to become a nationally dominant provider of bulk freight guides individual and group practice at the day-to-day level of task accomplishment.

Second, the industry and profession environments result in knowledge which is extremely contextualised and specifically constructed through their locally constituted sites of practice. Formal, accredited courses and qualifications equip workers with essential pre-entry training for the rail industry. Through ongoing, situated practice, industry and organisational knowledge capabilities are developed, and awareness of broader collective understandings and experiences is incorporated (Tsoukas & Vladimirou, 2001). Many workers possess extensive

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**Environmental Complexity**
- Operating environment, e.g. economic, political, public sector influences
- Industry, e.g. special nature of the industry and sector
- Organisation’s values, orientation, practices, structure and control mechanisms, constraints
- Drivers for change
- Impact of the work nature and demands

**Macro-level factors**
- The organisation’s mission & characteristics
- Nature of the industry
- Drivers for change
- Impact of work nature & demands
service histories and deep, personal, contextualised knowledge of rail and TransportServices’ processes, protocols, and systems at the apparent and embedded levels. A process of building new knowledge upon old and developing uniquely held knowledge resources among workers is likely to provide high levels of performance and competitive edge (Bogner & Bansal, 2007; Diereckx & Cool, 1989). This is because the workers’ practical knowledge is intrinsically associated with its socially situated work context and makes sense of its complexity.

Third, drivers for change in TransportServices include external pressures, in particular, (a) business requirements (e.g. rapidly expanding international coal freighting and freight infrastructure requirements), (b) government requirements, and (c) legislative issues. In addition, public expectations of the provision of rail services across widely dispersed regional centres and increased city populations are combined with increasing demand for higher levels of public transport on ecological-protection grounds. This type of demand is a new factor in TransportServices’ external environment.

Fourth, enactment of the organising principles within TransportServices result in a number of separate sites of situated, socially constructed practice enacting specialised types of professional expertise. Work activities are separated along functional unit lines, e.g. engineering and design drafting. In the case of significant projects, work teams incorporating required domains of expertise are brought together for the life of the project. Outside such projects, however, horizontal knowledge flows appear to depend on personal relationships across functional unit boundaries. Workers consider their workload to be intense and potentially, inhibiting social interaction which could contribute to knowledge generation and sharing. The use of external contractors to supplement staffing needs has been greeted with
suspicion by current employees. The internal environment, therefore, exhibits certain tensions between operational requirements, management actions and workers’ responses.

In presenting and discussing these findings, this chapter has provided the data that elaborates the complexity of the interrelated sets of macro-level environmental factors, within which knowledge generation and sharing behaviour is framed, established and enacted. The importance of the behaviour setting has been identified for instituting workers’ understanding of what is expected, required and valued, and their interpretation, beliefs and responses to this complex of macro-level factors, in turn, have been found to create their knowledge generation and sharing orientation and practice. Further, these behaviours are developed in the context of the locally work practice sites experienced by the individual workers, on a day to day basis. Presentation of relevant data and the dissertation’s findings relating to the local sites of practice are elaborated in the following chapter.
CHAPTER SIX

SOCIALLY SITUATED PRACTICE: KNOWLEDGE GENERATION AND KNOWLEDGE SHARING PRACTICES

The practical investigation conducted for this dissertation aims to examine knowledge sharing practices in an organisational setting to identify the mediating influence of relations between organisations and their workers, and the relations among workers. In Chapter Five findings about the macro-level mediating influences were presented and discussed. Building on the insights developed from these, findings are now advanced regarding the socially situated and constructed practices that mediate knowledge generation and sharing behaviour of the professional and paraprofessional workers. In Chapter Seven, the findings which illustrate the influence of micro-level factors are presented and discussed.

Relevant literature identifies the importance of socialisation through which new members of a social practice acquire the necessary knowledge and attributes to function within their organisation and in particular, as a member of their specific work grouping. Building upon their formal education, life experience and other work experience, workers engage in formal and informal organisational and work group processes, through which traditions, norms, practices and expertise are shared (Mezirow, 1991). As a consequence, members should be able to access the knowledge to function effectively and knowledgeable in their organisation and task roles.

It has been proposed, that macro and micro-level factors shape individuals’ relations with the organisation and their colleagues through which this knowledge is made accessible and shared. The work and social orientations of individual workers are derived through this
socialisation process (Brown & Duguid, 1991; Valsiner, 1998). Subsequently, the practices enacted by workers emerge from their relational framework, and their personal, work and social orientations (Antonacopoulou, 2006). However, proposed here is that workers’ knowledge-sharing practices result from the contestations and negotiations between these relations and orientations.

The chapter is structured in the following way in making this case. Findings from the data identify six associated themes that comprise these negotiations. Data illustrating each theme are presented and discussed in turn. The themes are: (a) how knowledge is socially and locally constructed and how expertise develops, (b) how information is accessed and gathered for role and task execution; (c) knowledge sharing practices and the influence of contested workplace relations, and (d) the value attributed to knowledge and expertise. Following that, findings demonstrating the influence of personal and situational factors on organisational innovation and knowledge generation are discussed. Finally, findings illuminating the impact of knowledge leakage and means of reducing this impact are presented and justified. In sum, the findings demonstrating the mediational role of socially situated and constructed practices for knowledge generation and sharing are advanced in support of the dissertation’s central proposition, that knowledge generation and sharing are mediated by the relations between individual workers and the organisation, and the relations among workers.

Construction of Knowledge and Development of Expertise

Specific qualifications are required for entry to the professional and paraprofessional ranks in TransportServices. Requirements for engineers, for instance, specify a civil engineering degree and for design drafters, a technical qualification. TransportServices
actively recruits young people who meet entry requirements, and provides in-house training to develop rail-specific expertise. Through such processes, professional workers develop much of their expertise and value after completing their formal studies (Alvesson, 2004).

The rotational engineer has a strong understanding of all the different aspects of civil engineering within TransportServices, what happens in all different sections. It is a networking exercise. You get to know people in other sections and other areas of TransportServices. And it also helps them, it gives … a well rounded experience, … and they can decide where they wish to work when they do apply for full-time (Robert, engineer).

Robert identifies multiple program outcomes: (a) trainees develop an integrated understanding of the organisation and an engineer’s role, (b) they develop useful networks of contacts and appreciation of where differing expertise is situated, (c) experience in a range of areas facilitates an informed choice for their future career at the conclusion of their rotational program and (d) their experiences provide opportunities to develop the range of skills and knowledge required by the organisation.

Respondents describe varying organisational induction processes. Frank and Ed report their initial induction as follows:

… a general half-day induction and then I went to (a regional location) later and we did the office induction about safety, fire, escape routes and all that sort of stuff, and then like track safety inductions about electrification and all that (Frank, trainee).

Ed (another trainee) reports a less satisfactory induction experience however:

When I first joined TransportServices the supervisor he spend one or two days helping me to do some inductions. I think there is a procedure as far as inductions are concerned in TransportServices but halfway through he sort of drift away and didn’t continue the inductions because I was excited to do work and my supervisor was too busy doing other highly prioritised jobs I believe … I’ve seen new Rotational Engineers come in and join TransportServices and they have been inducted in a better manner than I have. So I … sort of give myself a way of induction. (Ed, trainee)
So, while Frank previously describes the standard induction for new staff he experienced, Ed’s induction appears to have been curtailed by his supervisor’s work pressures. The process was, in his view, unsatisfactory as his supervisor placed higher priority on other tasks in preference to inducting a new trainee. As a consequence, to complete his induction process, Ed has to seek information as he requires it.

Another trainee describes his reaction to the traineeship: “There is so much to learn and I didn’t realise how much there is – but they say eight years generally if you are on the ball” (Gerald). Gerald’s comments illustrate his acceptance of being a novice: understanding that he will undergo an extensive period of learning in the organisation through interactions with more senior experts with whom he is placed and also complete a program of designated tasks. Gerald’s comments also illustrate his understanding that he will need to apply effort to meet the requirements.

The training process can be viewed from novice and expert perspectives in the following reports from Frank (a trainee) and Henry (an engineer). Firstly, Frank describes his work task progression:

When I first started here I was designing simply structures, that was during the first two or three months or so, after that I did a design check on a bridge because that was a more advanced thing because my boss wanted me to learn how to do it, and just recently I got my own bridge to finally design.

Henry recounts the senior worker’s perspective:

When they come to us we usually tell them what we are doing, design, drafting...we know that they trainees do not have experience. We… tend to give them more jobs like…checking, checking the design of the experienced engineers just to give them a feel of what we are doing. It is not designing, it is a small project and gradually goes difficult...under the experienced engineers’ guidance (Henry, engineer)

The process of guiding and coaching new graduate trainees is described by Henry (an engineer with more than 20 years’ service) as a planned process of development, beginning
with familiarising the recruits with the area’s work and operations. James describes the approach: “We learn by doing difficult projects in engineering, ones that stretch us but under direction of someone wise that can actually help us” (James, engineer). James identifies a process of guided experiential learning (Kolb, 1984) through involvement in real projects.

Angus recounts an instance of the initial phase of this kind of process:

I was given the task of actually teaching them the initial things, show them around the office, and show them where everything was, and show them a little bit of how we do, how we set up the drawings. How we go about our everyday work here … So it was just me and them for three weeks. While they were doing that they were obviously doing all the induction, all the things that TransportServices requires … And after those three weeks, obviously each one of them was assigned to a different sub-section … and is working at the moment under a supervisor (Angus, design drafter).

James and Angus outline the process of guiding and coaching engineers and new cadet design drafters, which adopt a similar approach. In sum, a scaffolding process is used to provide guidance and monitoring from more expert workers (Billett, 1999), as the trainees progress from studying and checking already finalised designs and drawings to assuming responsibility for complete design tasks under more distant supervision.

The challenges of the entry phase are described by Frank:

Probably took about six months for me to find my way around the office, because until I actually came up in the job I wouldn’t know what to do otherwise. And it took a fair while to get into the swing of things (Frank).

Here, he describes the process through which he was introduced to and learned how to ‘be’ in this workgroup and organisation, for instance, the existence of implicit social and communication routines hidden from the outsider. Although Frank was previously employed as a civil engineer with another organisation, he must learn and adapt to the socially situated construction of his role in this workgroup and pertinent organisational procedures and systems.
Barry highlights the unseen, relational and more political aspects of organisational life, which provide the situational framework for operating successfully in a modern organisation: “The corporate induction gives you the glossary, but it doesn’t go into the intricacies of business groups and salary, internal politics of project managers and other things we need to interact with” (Barry, engineer).

The induction process necessarily involves learning ‘how to act within a domain of action’ (Tsoukas & Vladimirou, 2001). Trainees acquire behaviours, use of language and the meanings represented by language, behaviours and artifacts as they are employed within a specific workplace context (Berger & Luckmann, 1984). However, making meaning of the situational context and its unseen aspects is not always easy. Frank describes how he deals with the large amount of information to which he has access as a member of the workgroup:

But then emails and stuff come out that you don’t really take much notice of them because I don’t think they are relevant for my job because I don’t know I have to do this sort of stuff. I just ignore those emails and when the time does come I will actually ask some one what to do (Frank, trainee).

The meaning of such communications is not apparent to Frank, as they deal with local, ongoing projects or issues. Their meaning is, therefore, socially situated in its construction. In order to access meaning constructions, Frank asks knowledgeable others for explanations. So, he is dependent on the social relations in the work setting for much of his progress from the periphery occupied by the novice, to a more central role as his knowledge and expertise develop, in accord with the process described by Lave and Wenger (1991).

Training programs of the type described here are predicated upon knowledge sharing between more expert, experienced workers and the novice trainees (Gherardi, Nicolini & Odella, 1998). As described here by the novice Ian:

I think they are pretty generous with how they share their knowledge. They actually encourage us cadets to learn as much as we can. There has been a few
times where I’ve gone on site, a bit of a walk-about I suppose, and they take advantage of that a lot – every opportunity – explain what this post means, or what is this symbol. You find that sometimes because they have been working on that field for so long they just sort of expect it to be sort of common knowledge I guess, so there is a lot of times where you have to speak up and ask. But they are pretty free with their knowledge, pretty happy to share it (Ian, trainee).

So, Ian describes the training and knowledge sharing process as generous, based in practice and opportunistic. However, he notes the heuristic aspect of some knowledge where it is held by more senior workers. It informs these senior workers’ decision-making and actions but is not apparent to the novice (see Stewart, 1997). In such situations, a trainee might have to identify their own knowledge gap and question the more experienced colleague.

For Ed, this knowledge identification process is a challenge:

Being new you would have to do a lot of searching for information, talking to the right people and asking the right questions. Sometimes you don’t know what question to ask because you have never done all these things before ... As far as a Rotational Engineer is concerned, a lot of times we are thrown in the deep end and we have to be on our toes (Ed, trainee).

Ed has experienced learning situations that can provide deep learning but create a high risk climate for the trainee. Help-seeking behaviour tends to be informal and based upon identifying the ‘right’ person. Such behaviour has been identified elsewhere with creating valuable opportunities for building personal networks (Hargadon & Bechky, 2006). Being a trainee, therefore, can sometimes be intimidating for new recruits who wish to make a good impression but are learning simultaneously through their work. Willingness to learn is demonstrated by taking risks in attempting tasks for the first time, seeking information, demonstrating their learning through asking appropriate, thoughtful questions, and incrementally more competent performance, as Ian notes:

… as we do our timing and years roll over they will just keep pushing us and pushing us, they keep challenging for us which is good … as time goes on and they believe you can do it and they hand it over (Ian, trainee).
Ian anticipates that through demonstrating competence, he will receive increased responsibilities. Hence, recognition of developing skills and knowledge comes in the form of more advanced tasks and autonomy. Acceptance into the knowledgeable collective in this workplace is further indicated by the larger, more expert group’s willingness to receive trainees’ suggestions for improvement in design or workplace practices: “We get encouraged to speak up and say if we have any thoughts on how to improve a concept or anything” (Ian, trainee).

So, intellectual contributions by novices will likely be progressively accepted on the basis of their own merits. Invitations to contribute incrementally signify achievement of ‘insider’ status to the newcomer, strengthening interpersonal relationships and building loyalty to the workgroup and organisation (Pfeffer & Baron, 1988). Further, the benefits of novices’ participation can be reciprocal - openness to new ideas from newcomers can result in improvements to the workgroup’s routines, procedures and technical processes (Nelson & Winter, 1982), thereby generating new organisational knowledge.

In summary, the graduate rotational program for engineers and the cadet traineeship for design drafters provide mechanisms to facilitate adoption of the organisation’s formal norms, beliefs and processes by novices. The programs are designed to achieve multiple outcomes.

Macro-level outcomes identified here include: (a) organisational orientation and familiarisation, (b) the development of organisation-specific knowledge and (c) the internalisation of the organisation’s values and approach, designed to provide the organisation with a basis for long-term growth (Collins & Smith, 2006; Tsui et al., 1997). Micro-level outcomes include: (a) development of personal rail engineering and design expertise, (b)
access to knowledge and interpersonal networks, (c) team-identification and support throughout the phases of entry, and (d) negotiation of role and relationships and the contestations involved in establishing a place within existing work and project groups. In this way, mentoring and formative experiences may reduce potential alienation arising from the organisation’s size and the complexity of the working environment, for valuable young recruits (Grey, 1994). In the following section, data is presented to illustrate information and communication flows necessary for task accomplishment.

**Accessing and Gathering Information for Role and Task Execution**

In this section, findings illuminating how individual workers access and gather the information necessary to carry out their job role and tasks is presented and discussed. General communication methods include meetings of functional groups and project groups, together with intranet use, e.g. email and internal databases: “There is so much going on. Generally, it is through emails or you hear other people talking, that is the probably the main pipeline in the office area just hearing other people talking about it” (Frank, trainee).

Consistent with other respondents, Frank identifies email and conversations between colleagues as the main communication methods for ongoing information. Intranet methods (such as emails) are utilised as formal communication channels in modern organisations. However, intranet methods along with workplace conversations, also form part of the organisation’s informal or shadow communication system (Stacey, 1996). Informal methods of communication, such as workplace conversations, have been identified as more useful when seeking help by Hargadon and Brechky (2006).
Gathering information for task accomplishment includes use of hard copy manuals and guides:

Civil design office manual is accessible to all in the group in hard copy. The survey section manual is held in their area and not able to be copied or taken away. It is considered to be TransportServices’ intellectual property. The Clearances information book is copied for all new staff as it is the essential information ‘bible’ for Clearances. Also there are the calculation spreadsheets developed by Roger (Tom, engineer)

Open access for workers in this section is provided through key manuals and guides which are not available electronically. For instance, all new staff receive a personal copy of an essential guide on clearances. Other historical information is available for reference, together with the Standards (CESS) as described previously:

Historical information is kept. There are old civil engineering publications and standard practices developed in previous situations from actual reports on jobs – they become generic practices. They are now superseded by CESS – more like a quality standard (Tom, engineer)

Reports from previous jobs contain details of past challenges, problem-solving, innovations, and recommendations for future action, which become adopted into current practice. In addition, Angus (a design drafter) and Duncan (an engineer) report use of electronic management systems and master files which workers can access for guiding information. Angus comments:

We do have a drawing master system where we have to keep it updated all the time and all our drawings need to be managed by that system, so anyone that is coming through needs to be aware of all these things that are happening in the section. We can’t sort of make someone sit there and learn by themselves. They have to be shown at least so that they are aware of what is, how it is done in the section, and from then they will start to learn other things (Angus, design drafter)

Additionally, Duncan notes:

We have to understand the computer network … Where the files are stored, the work flow sort of process … who to ask … for help … pretty good organisation as far as helping people … I guess you find out by asking someone about it – word of mouth. I don’t think there is any real list. I mean, you really need to know the
organisational structure so that you know where people exist in the organisation. Through their supervisor, he will guide them to where, who to ask, and where to go (Duncan, engineer and supervisor).

In sum, TransportServices maintains information resources for staff access in this area which fulfil several functions. Firstly, they function as a repository of past accomplishments, learning, problems faced and overcome, and the results of reflections in the form of recommendations across a wide range of projects and settings. Secondly, they provide an historical data bank supporting the area’s culture and values enacted throughout its work history, reinforcing its disciplinary and industry identity (Feldman & Feldman, 2006). Therefore, they constitute a valuable reservoir of organisational and workgroup memory (Walsh & Ungson, 1991) of the knowledge constructed over time. Thirdly, they facilitate current project accomplishment by providing task facilitation, recording, and management systems. As noted by Angus and Duncan, however, they are incomplete without the heuristic knowledge of group members which supplements these resources and provides a sensemaking process (Weick, 1995) which locates the knowledge within its locally situated, task context.

More formal information distribution and knowledge sharing mechanisms include meetings:

Management meetings, every two weeks. Today’s managers have their own supervisor meetings and staff meetings. They usually have two things. So I have a management meeting every two weeks, the managers have supervisors meetings every whatever, they’re different frequencies, different managers, and they also have staff meetings (James, manager).

Formal and other kinds of staff meetings are held by managers and supervisors in order to distribute information, monitor progress and solve problems. In addition, informal information gathering and help-seeking through personal interactions is described by many respondents. For instance, Gerald (a trainee), adopts organisation communication protocols:
I usually ask my supervisor who attends meetings with his clients and what not, or if I’m dealing direct with a client they will usually provide me with everything they need and what they are expecting out of the results (Gerald, trainee).

Gerald’s task information is validated by the organising principles: his supervisor provides necessary information and is accessed for supplementary information. Clients provide information and requirements to ensure task execution. Such direct communication methods access other people as resources and use of the organisation’s communication arrangements.

I already know much information needed – past experience guides me. I ask my supervisor who is quite accessible, discuss it with my peers or the draftsman. I might send an email to someone who I think should know. I might officially ask for advice or do an internet search. I might ask other TransportServices sections (Tom, engineer).

Tom has extensive experience in his field and within the organisation, and describes his problem-solving approaches such as drawings upon his own personal knowledge and the organisational database, to execute his tasks. However, individuals working alone are not always able to generate new insights (Fiske & Taylor, 1991). Consequently, they might also draw upon informal, electronic and formal information resources to build contextualised knowledge for specific tasks.

How close can I come to this live overhead powerline and that doesn’t come into the civil aspect … need to know somebody down in electrical engineering that you can go and talk to, to get what their standard requirements are, and incorporate that in the advice that goes back to the consultants. So just from being within the railways you get to build up a list of contacts of who to speak to in those areas, say electrical, signalling, operations, other engineering disciplines as well as operational … That only comes from being here and getting to know people and you find out who’s a good contact and who knows the right information, who to go and ask for the right information. (Tom, engineer)

The experience of novelty or failure in work tasks (characterised by Gersick and Hackman (1990) as interruptive events) can create openness to new learning and hence, knowledge generation may result. While some mistakes may result in knowledge leakage,
errors have been identified elsewhere as potentially leading to greater learning and better performance (Heimbeck et al., 2003).

Tom emphasises the importance of building and using his personal networks to extend his own knowledge. This process provides access to other knowledge reservoirs (i.e. the knowledge domains of other expert specialists), and allows him to access the contributions of others’ expertise (Fiske & Taylor, 1991). Robert elaborates:

Say there’s 370 engineers in TransportServices and that’s like 380 asset data bases within TransportServices. So … you know which particular person to speak to, to get the data out of which particular data base (Robert, engineer).

Robert describes the influence on knowledge access of knowledge location, interpersonal interactions, relationships, and negotiations. His comments further illustrate the relational context of knowledge sharing, manifested in social action and mediated by negotiations which may be influenced by the relations between Robert and other workers, and each worker’s practices and priorities (Gherardi & Nicolini, 2000).

In sum, the twin processes of information access and gathering illustrated above demonstrate use of a range of resources and methods. For instance, approaches include methods such as: (a) individuals’ personal knowledge and organisational resources and databases in hard copy and electronic forms; (b) consultation with superiors formally and informally, and (c) consultation with knowledgeable others (for example, peers and workers in other areas) to facilitate problem reframing and knowledge generation. These options are important in a large organisation, as the size and geographical dispersion of the overall workforce, the extent of the historical data detailing past practices and the existence of various internal coding systems in electronic databases create impediments to individual knowledge-seeking.
Communication and interpersonal relations for knowledge sharing are reported by respondents as central to maximising problem-solving outcomes and knowledge acquisition. Conclusions drawn through their interactional history with other areas and other colleagues (both within and external to the worker’s own group) provide information about knowledge resources which will support task accomplishment. However, access to knowledge and knowledgeable others is dependent upon the presence of social relations which are supportive of knowledge sharing interaction and facilitate access for the knowledge-seeker. In the following section, the influence of social interactions and the contested nature of workplace relations upon knowledge generation and knowledge sharing practices are discussed.

Knowledge Sharing Practices and Contested Workplace Relations

The nature of interactions and negotiations among workers and between the organisation and its representatives (e.g., managers and supervisors) provides the context for day-to-day workplace relations. In Chapter Two, the socially constituted and negotiated nature of knowing (Orlikowski, 2002), knowledge generation and knowledge sharing were elaborated. In this section, data illustrating macro level issues arising from the impact of those interactions upon knowledge generation and knowledge sharing is presented and discussed. This is important because these interactions shape an organisation’s ability to effectively use the knowledge within it.

Previously, it has been established that among respondents there is a reasonably coherent shared understanding of the organisation’s mission and purpose. Therefore, respondents demonstrate knowledge and acceptance of the overall purpose of their
participation in the organisation’s activities and their day-to-day practices. However, evidence of differences in values, perceptions and priorities is provided by James, who is a manager:

We find managing across the organisation is the most difficult for my managers. Very much so. And that’s driven from their little silos. You see it even in my group, a bit of a parochial attitude to their own little patch. I mean that’s another role I play is to try and moderate that. Because I don’t believe it’s all bad being that sort of thing, but I just believe you’ve got to be moderated and work together. I think there are things about teams, like you know having your own patch and being a team. … our cultural evolution is really based too on tribalism. … Same as the workplace. And the loyalty bond between you and your boss is the same sort of relationship. (James, a manager).

This manager describes the ‘silos’ that result from the organising principles which place workers into functional and task related groups (see North, 1990). James notes positive outcomes, for instance, loyalty to the immediate supervisor and other group members, and feelings of insider status, as identified by Pfeffer and Baron (1988). Mechanisms such as teams, networks, and meetings to underpin shared goals and task achievement is described as clan control (Turner & Makhija, 2006), and are associated with increased interactions to facilitate knowledge sharing.

Conversely, strongly developed perceptions of shared identity and best interests have been found to impede the flow of knowledge which challenges accepted group or network norms (Lynn et al., 1996). Consequently, such group or network associations may maintain the status quo rather than adapting it or refreshing it. James highlights his responsibility to integrate the groups’ activities and moderate inter-group processes groups which may impede effective functioning such as knowledge sharing. Supporting the manager’s comments, Tom describes information flows: “There is little information flow horizontally – it comes together more at a more senior level, not at our level. The supervisor manages and integrates” (Tom, engineer).
These comments indicate that horizontal information flows are in fact negatively influenced by the development of separate group identities. Such worker-level practices can neutralise or replace overarching organisation perspective and goals (Valsiner, 1998), potentially adding complexity and tensions, and reducing knowledge sharing.

Formal knowledge sharing processes take place, for instance, in reviews of completed projects:

Because we’re a design area and a construction area where we let construction contracts out, at the end of the contract a construction report comes in and that deals with all sorts of contract issues but it can also deal with the design deficiencies and problems. So that’s another knowledge sharing process and the recommendations are tracked and actioned (James).

Valuable knowledge generation has been associated with reflections upon practice, with insights leading to development of alternative problem solutions (Clancy, 1997; Schon, 1995). Similarly, troubleshooting presentations are scheduled:

Every now and then the Contracts Engineer will give presentations on work that’s being built. They tend to point out problems with design, problems with documentation. That can be helpful if there are problems with the design of abutments or pavements or whatever … I suppose sometimes the only problem with that is it’s usually after the job is finished. So sometimes you could have designed another two or three jobs in that period and it could have been handy to know earlier (Nick, engineer).

From Nick’s perspective such activities are helpful in sharing knowledge with the larger group about specific problems and problem solutions which have been developed. In the everyday work environment, appropriate timeliness of information varies according to individual work tasks. Henry (who has more than 20 years’ service) describes processes designed to support timely provision of information.

What we are doing is if we have information that needs to be put on our drawing or something like that it will need to be shared with others, not just the draftsmen that work on the project but also engineers who also check and supervisors (i.e. construction supervisors), that they do not get surprises when the things come to them (Henry, engineer).
Attempting to ensure completeness of information to meet differing task domains in complex projects is challenging yet assists effective performance. Henry describes a process which requires understanding of the broad range of information requirements of all areas working on the project. This type of understanding is constructed over time and experience in the workplace setting.

Knowledge is one thing, but I think networking and understanding of the organisation is probably just as important. And what I mean by that is that you can have a significant project that utilises pretty well all facets of TransportServices. Somewhere along there you have to be able to bring all those different players together to work as a team (Cameron, design drafter).

In Cameron’s view, coordination of the knowledge held by different groups and specialists is, therefore, an essential task when projects draw upon various knowledge domains within TransportServices. Increased knowledge generation and sharing have been identified elsewhere (Un & Cuervo-Cazurra, 2004) as arising through interactions among workers with diverse knowledge. Here, coordination is helped by understanding the differing contexts and possessing personal contact networks across areas which collaborate on projects.

Todd emphasises the importance of personal contacts:

If I’ve got the right contacts, I’ll advance my case but if I don’t know the right contacts, I don’t know the right people, I probably won’t do too well. It becomes a more personal issue rather than an organisational issue. So you do need to go out of your way to create a pool of knowledge.

Therefore, a strategy of actively developing a network of knowledgeable contacts is important for Todd’s effective performance. He suggests that without such a network of ‘the right people’ his ability to advance ideas will likely be adversely affected. This is supported by Tom:

There’s a lot of information or a lot of expertise held in people’s heads you need to know whose head to tap into … That only comes from being here and getting to know people and you find out who’s a good contact and who knows the right information who to go and ask for the right information (Tom, engineer).
Social networks underpin the knowledge sharing practices and problem-solving of Tom. Informal and unstructured methods for seeking and giving help require willing collaborators and trust in the expertise of the helper, and are often described as more helpful and valuable than formal methods (Hargadon & Bechky, 2006). Professional and personal networks generate opportunities for exchange of information, ideas and skills (Dunphy & Griffiths, 1998).

In James’ view, interactions take place with others on the basis of their positional power and authority to act (Fiedler, 1967). “This thing about informal networks - I think it’s more about people that (have) authority to do things, they’re the people you talk to rather than people doing you favours” (James). James suggests a transactional interaction to further instrumental purposes rather than a reciprocal exchange arising from relational history and contributions. Indeed, network associations and relational history with higher status others may increase a worker’s status, collaborative opportunities, and advancement of their new ideas (Gherardi, Nicolini & Odella, 1998; Granovetter, 1985).

Differences in value systems, power relations, group memberships, individual and group norms and beliefs, and differential access to resources such as information, create political dimensions to knowledge and knowledge sharing. Alvesson (2004) considers knowledge to be ‘closely related to power’ (p.57). Hence, a reputation for expertise may increase an individual’s ability to exert influence in the social practices enacted in the workgroup.

Instances of knowledge sharing behaviour are described by all respondents. The workers most dependent upon knowledge sharing are the trainees, due to the constructed nature of the rail expertise in which they are being trained. Ian and Gerald report as follows:
It is really a pretty good place for that reason, they share knowledge pretty easily. There is no reason why I can’t go up to anyone to ask a question and get a good response back from them (Ian, trainee).

If you are sitting there struggling … they definitely sit down with you and have a look at it and help you out (Gerald, trainee)

These trainees experience accessible, volunteered knowledge sharing relations with the longer serving workers. Gerald continues:

For 80% of the time, they will let you have a crack at it yourself and trial and error, and if you do no good they will say ‘this is how I would have done it’ and if they know that it is a good job they will definitely sit down with you and walk you through it … That is how I can tell they’re experts, because straight away they just know the answer and they have no dramas with it (Gerald).

As novices, Ian and Gerald represent little immediate threat to the more experienced organisation members (Lave & Wenger, 1991), and the training programs are well established mechanisms for the development of new recruits to the area. Therefore, knowledge sharing with trainees could reasonably be expected. For experienced workers, however, seeking help may be associated with negative outcomes arising from perceptions of inadequate expertise and under-performance (Ashford et al., 2003).

Yet for Tom, (who has a lengthy period of service with TransportServices), asking for help from specialist workers in another area is foremost an efficient and time effective means of accessing the organisation’s knowledge. “It’s easiest to go and talk to somebody in track engineering and say well what is it? And they will pass on that information” (Tom, engineer).

In this way, different groups of people and their knowledge domains are brought together.

Referring to the challenge of drawing on the large collection of historical and operational data, Robert highlights the assistance of colleagues:

There’s an awful lot of information that’s made available electronically so you go and say to someone, I’ve had an enquiry about this, not sure where to look. They’ll say have a look at these documents, they’re on the system and I find that if
If you do a search for them you can find them very easily. The information is there. If you need an interpretation, I go and ask someone (Robert, engineer).

The information available through electronic databases and intranet sources was highlighted by numerous respondents. As with hard copy resources, specific or unfamiliar information may be difficult to locate or may require interpretation. Robert values the role his colleagues play by converting the data into useful information and making sense of the information accessed for the local, situated practice. Similarly, Duncan describes the knowledge sharing behaviours of his colleagues:

If you asked them a question they would give you a detailed answer, they won’t sort of fob you off sort of thing, and also they sometimes can direct you to other sources of information and they are just generally free to have an in-depth discussion on what you are interested in (Duncan, engineer).

The willingness of co-workers to spend time and provide sufficient level of knowledge is also reported as valuable by Duncan. He describes knowledge sharing behaviour which focuses on achieving quality outcomes and meeting his needs. Such interactions provide more than basic level of information provision and reflect organisational citizenship behaviour as discussed in Chapter Three. In addition, willingness to engage in in-depth discussions may reflect the emotional involvement some workers possess for railway issues, described in Chapter Five.

They willingly share it out. Especially if you ask they will share it out. Someone is having a similar problem, similar type thing they will try and tell them what they think, the experiences they have had with it. I haven’t really come across many of the people who keep it within themselves (Malcolm, design drafter)

Receiving the benefits of others’ experiences is a primary outcome of knowledge sharing in Malcolm’s experience. Problem-solving through shared narratives facilitates the matching of current task characteristics with those previously encountered by colleagues (Clancy, 1997). Such narratives become a way of accessing locally constructed, contextually
appropriate organisational knowledge (Lorenz, 2001). Consequently, existing knowledge confined within projects can be captured and distributed across other projects. This process addresses a key inefficiency identified in project-based work, where new but similar projects are approached from the beginning (Bresnen et al., 2003; Watson & Hewitt, 2006). In William’s experience, the workers collaborate to contextualise the information and provide meaning, so that the data becomes useful to the work practices of the group. Supporting this, he claims his experiences to be the norm: “There will always be someone that can give you an answer” (William, engineer).

Based upon his previous engineering experiences, he has positive expectations of receiving knowledge sharing assistance from his co-workers when he needs help, emphasising the importance of person-to-person interactions. His comments reinforce the nature of the area’s environment wherein it is accepted to seek advice, i.e. a psychologically safe environment where openness about a knowledge gap can be acknowledged (Edmondson, 1999).

James reports wide-scale, ongoing learning and knowledge construction, arising from interactions between workers, centred on sharing of task and experience-based knowledge: “There’s an enormous amount of interaction going on there, learning going on there from experiential based stuff.” (James).

Knowledge generation in this way, is held to arise from the differing perspectives and knowledge domains of colleagues, which assist development of new connections, new frames of reference and a different range of potential solutions to task accomplishment (Fiske & Taylor, 1991). In this way, new knowledge is contextually constructed through social practice. The interaction-based knowledge generation process identified by James requires mindful
attention to the expertise and suggestions of colleagues (Weick & Roberts, 1993). As an engineer with more than 20 years’ service, Barry notes: ‘Some have an interest in learning, some don’t.’ Knowledge sharing is, therefore, assisted by relational factors, for instance, access to experienced others and the willingness of colleagues to share their personal learning, together with the collective knowledge generation that occurs when individual contributions combine with existing knowledge, reshaping its meanings and usefulness (Hargadon & Brechky, 2006).

Knowledge sharing practices take place within social practice frameworks.

I think it is really personality related or project related. I think it is more personality based or more team based. If they are all working on the same project then they are sharing information. If they know each other they might talk to each other and discuss it. (Todd, engineer).

Consequently, Todd suggests that knowledge sharing occurs for instrumental purposes (i.e., task execution such as a project) or on a personal level i.e. within existing interpersonal relationships. He envisages open and serendipitous sharing of information in the context of the team’s functioning or where individual workers have a prior relationship and interact informally.

If you are working closely then you do tend to spread your ideas around. Whereas in a bigger group it is harder to spread the ideas from one side to another (Malcolm, design drafter).

Knowledge sharing is influenced by the degree of contact and how closely workers are collaborating, in Malcolm’s view. In close working relationships, he suggests more open and wide-ranging sharing develops. In larger group situations, he suggests that knowledge sharing in the distant relationships is impeded by the personal distance and reduced level of interaction, as contact with some colleagues will probably be less frequent. He identifies close working relations as a key influence upon effective knowledge sharing.
Distant or difficult relationships may have an adverse impact upon relationship-dependent outcomes (Goh, 2002) such as knowledge sharing, e.g. for trainees. Previously, trainees Gerald and Ian described their positive experience of knowledge sharing with more senior colleagues. However, not all trainees share this experience:

One of the other cadets has been pretty slow … It might be because his supervisor is so busy. I know he is not as much up to speed as far as we are – the other three of us. I wouldn’t say that was his fault, as he’s a pretty smart kid. I think a lot of that development process does fall on the supervisors. They have to feed you work because they’ve got to train you up I guess. He’s been doing the same stuff for a long time now (Ian, trainee).

Ian recounts the situation of a trainee whose progress appears to be impeded by his relationship with his supervisor, who is responsible for providing access to more advanced work. The competing priorities experienced by the supervisor guide his choice regarding the matters to which he directs his attention. The trainee described by Ian lacks sufficient positional power (Fiedler, 1967) to influence the supervisor to attend to his training requirements, hence his progression and development as a member of the collective and the profession is impeded (Lave & Wenger, 1991). Similar challenges are also described by Ed:

With consistency of questioning in a very humble way and very friendly way they finally give out what they know, although they might give it out very reluctantly. But finally they give the information. It can be a pain (Ed, trainee)

Here, Ed describes a process of negotiation to obtain access to co-workers knowledge. The process requires persistence and strategies to build interpersonal connections and manage the impression he creates (for instance, being humble and friendly). He reports believing that for knowledge sharing to occur, he must ensure that his colleagues do not feel threatened. He claims considerable effort in managing the relational aspects of the knowledge exchange situation, which he finds frustrating. An ‘arduous relationship’ may prevent knowledge transfer (Szulanski, 1996), impeding trainees’ progress within the knowledge collective.
Knowledge sharing orientations and practices are shaped by contested personal relations. For instance, other respondents described difficult or frustrating experiences with co-workers:

They don’t tell you where it is, they say I’ll get that for you. Well that’s handy, I’ll have to come back next time I need something. Then … that’s protecting information. Whereas if you can sniff around and ask the right people you eventually find where it is so you can go and get it whenever you need it. (Robert, engineer)

Some co-workers are seen to actively create and maintain personal knowledge domains. As such, these workers create a means of gaining acknowledgement of their knowledge, expertise and past achievements, as other workers must interact with them in order to access it (Crossan et al., 1999). In turn, this reinforces their value to the organisation and their workgroup. Robert describes a process where, rather than build the help-seeker’s knowledge, these workers attempt to constrain the knowledge to their own personal expertise. Tom and Barry (engineers with extensive service histories) are aware of a worker who is reluctant to share what he knows:

Keeps everything to himself. You’ve got to really pry it out of him … it is a cultural thing that has occurred over many years, where I think he feels that he has been wronged within the organisation, and his way of getting back at the organisation is to withhold information. If you ask him, it is not forthcoming (Barry, engineer).

Barry attributes this worker’s behaviour to his personal history with the organisation and its representatives (i.e. managers and supervisors), that has generated beliefs about being treated unfairly. As a result, he does not share his knowledge.

Yes, there is one person that I can think of, who, the person I’m thinking - can't get blood out of a stone when you come to asking. Yes, there is one person, but generally 99% of the people haven’t retained all that knowledge so that they can claim to be the expert (Tom, engineer).
In Tom’s view, most other co-workers will share their knowledge rather than attempting to create a reputation as an expert with exclusive knowledge properties. Such political behaviour may occur where expertise is constructed in the professional field through extensive experience and reflective practice (Schon, 1995). Reluctant knowledge sharing is also described by Todd:

> If they are not able to convince the other person that they’re right, or whatever, that’s when they share some more knowledge and give more insight to the problem. So it’s a way to still influence and then advance your cause … If they get challenged they usually tend to open up a bit more and explain why they’re saying what they’re saying and what are the issues (Todd, engineer)

In this situation, knowledge sharing is a strategy used to secure dominance in a debate or to deal with challenges to their point of view. Knowledge is advanced to provide more persuasive weight to the worker’s argument by sharing the rationale and broader issues (Cross & Sproull, 2004). Political behaviours designed to influence outcomes, create attributions by fellow workers, and alter relationships among workers are commonly associated with the location of valuable organisational knowledge and knowledge sharing behaviour (Tsoukas & Mylonopoulos, 2004; Vince, 2001).

Job role demarcations can also be a barrier to knowledge sharing, for instance:

> For example, there is a program, I am a civil engineer and some people on this floor are a draftsperson. And their main tool is in AutoCAD. I have something that I want to do and I want to measure and I need to use this program AutoCAD, and then I need to draw something, but I am an actual engineer. I’m not supposed to do that. I am supposed to ask the draftsperson to do that for me. But if I ask him to do it for me that would involve a lot of effort, a lot of communication there, a lot of ‘have to tell you what to do’. But if you just show me one or two things I can do the rest of the work. That sometimes can be challenging (Ed, trainee).

Barriers can arise in both directions: the help-seeker may experience barriers to knowledge sharing resulting from job role demarcations that specify tasks for which each job role is responsible. Conversely, the help-seeker may perceive that the process of gaining the
information required is complex and respond in a negative way. Consequently, the larger organisation’s organising principles may create an environment which creates frustration (Fiol, O’Connor & Aguinis, 2001).

Conventional knowledge management techniques encourage documenting key organisational information, guidelines, processes and procedures. Angus identifies a knowledge sharing barrier arising from formal documentation processes:

> I think that’s where a lot of the organisations fail because people up the top like to think that by putting words to paper that is going to filter through to the bottom person and say ‘the bottom person knows all about it’. The bottom person doesn’t know anything about it because they are not really inclined to read a whole heap of papers and say ‘oh I know a lot about it now’. They should be more inclined to actually get up and walk around and say ‘OK what is the best way for me to actually go and speak to these people, right at that back level so that … they can actually see it, they can absorb it’. (Angus, design drafter).

Angus suggests that methods of sharing knowledge should be attuned to the communication preferences and workload of the recipients. He proposes face-to-face briefings and informal interactions as more effective than formal, written communications for the organisation’s general worker population. Roger highlights an additional aspect of documented information:

> Putting information into a document can give a false impression that that is all that needs to be known – however, the application, relevance and problem solving for particular circumstances depend on the individual to take further (Roger, engineer).

Roger has more than 20 years’ service with TransportServices and is identified as a valuable expert by several other respondents. He cautions that documentation can constrain further knowledge generation and adaptive flexibility to task contexts. The existence of a documented framework may lead to dependence on and implementation of that framework without further modification to ensure appropriate contextualisation, review and re-development, thereby leading to sub-optimal outcomes (Currie & Kerrin, 2004). Further,
where documentation or databases suggest pre-determined decision-paths, barriers to innovation and knowledge generation may have been inadvertently created (Lawrence, Mauws, Dyck & Kleysen, 2005).

In summary, knowledge sharing within this setting is enacted using a range of interpersonal and organisational processes. However, the findings suggest that knowledge sharing is facilitated by social interactions (Inkpen & Tsang, 2005; Lane & Lubatkin, 1998; Zahra, Ireland & Hitt, 2000). These social interactions occur within a range of over-arching, existing task and personal relationships, personal and group behaviour norms and values, and workgroup practices. The interactions create opportunities for enhanced collective knowledge generation and sharing. They also demonstrate political characteristics which influence the location and sharing of knowledge (Edelman et al., 2004). Further, knowledge generation processes may be constrained by adoption of inappropriate documentation approaches. So, knowledge generation and sharing practices are fostered by a work environment which supports knowledge generation and sharing (Tierney & Farmer, 2002), time spent in learning and development (Subedi, 2004), and the development of knowledge and expertise (Bock et al., 2005; Orlikowski, 2002). This includes the particular value ascribed to this knowledge.

In the following section, data illustrating the value attributed to knowledge and expertise is presented and discussed.

Value Attributed to Knowledge and Expertise

Valuable, unique and deep knowledge are associated with individuals and also with workgroups in organisations (Alvesson, 2004). Such knowledge is composed of technical expertise and knowledge of the organisation and its systems. It may be associated with a
sustained length of service in the profession and organisation. Alvesson (2004) suggests that valuable knowledge should be defined and described within its field of operation to ensure it is recognised. Here, findings that demonstrate the extent to which knowledge and expertise are valued in this organisation is presented and discussed.

Within TransportServices, respondents identify valuable expertise in the following ways:

Really valuable people are those with a long history with the organisation. Our field is unique. Rail is very specialised knowledge. Our knowledge is specific to TransportServices. We are always leaning on those people who have been doing the job here a long time because of what they know and have experienced (Angus, design drafter).

Value arises from several factors, according to Angus: (a) lengthy service history with the organisation can be associated with well developed acquaintance with the organisational procedures, (b) expertise in the unique railway knowledge domain is constructed by working and practicing within the domain, and (c) extensive work history in the field creates depth of knowledge and experience in the range of problem-solving and project work that is typical of the field. Therefore, he indicates a belief that work history over a long period incorporating a range of projects, creates a valuable reservoir of experience in task challenges on which the group as a whole depends.

When they tell you something that there is no real doubt about the validity of what they are telling you (Barry, engineer)

For Barry, the value of the expertise which certain co-workers possess is the validity of the knowledge which they share. Their information does not have to be validated with others or through other resources. This creates a high level of trust in the information, an attribution which has to be achieved through repeated interactions over time (Weick, 1991) where the information has been found to be valid and reliable. Through the history of interactions,
evidence has developed to demonstrate that these co-workers are a rich source of valid, useful trustworthy knowledge which assists task accomplishment.

Two people who are almost indispensable … And it’s because they have a very high level of technical knowledge (Dennis, design drafter)

The high levels of technical knowledge which two colleagues possess are valued because their technical knowledge combines discipline and applied expertise. Their contribution, based upon this technical knowledge, is recognised by Dennis as adding value in a way which almost no one else can provide.

Dennis and Malcolm describe below the contributions made by workers who combine expertise and strategic thinking. As Dennis notes:

Yes, he has been in the job a fair while, that is one part of it. He also keeps his ear to the ground and he knows what is happening to the business in the longer term … he can see the conflicts that are going to happen and some of the long-term solutions. He already, when he has been asked to solve more problems in the yard there, knows that he has to account for what is going to happen in the future, that nobody else has even thought about yet. When he is at meetings and he says ‘yeah, you can do that, but what about this’? … He is very good. But there are two of them, not just one. We hold them up and we say to them (to the junior people), ‘this is where you need to get to – the sort of level of thinking that you need (to) exercise’ (Dennis, design drafter).

Similarly, Malcolm adds:

He doesn’t just think inside his square box sort of thing. He thinks outside the box … – if you do this what happens further down the track sort of thing – or how do other people, or other sections or operations would react to something that you do here? It is more not anything specific that he does or anything like that, but the way he thinks (Malcolm, design drafter)

These respondents identify that certain workers combine technical and rail expertise, experience, and the ability to think more strategically and temporally at a level beyond the immediate problem or task. Further, Dennis notes the use of additional knowledge sources (e.g. ‘keeps his ear to the ground’) and a broader perspective (e.g. ‘knows what is happening to the business in the longer term’) which enhance his strategic approach. Such workers
contribute both expertise in the knowledge domain or discipline, and integrative cognitive abilities which build the group’s performance and task capacity to new levels, thereby increasing absorptive capacity (Cohen & Levinthal, 1991). In this way, increased organisational capacity can result.

Some special design work that we hadn’t done before he had done. We used him as a key designer in some of the work. I often now if we are doing some external work, have him project manage the work. And the reason I do that is that I can get him acting at a higher grade when I do that. So I let him run with that and he is fairly good. But certainly he had some specialised knowledge that we didn’t have and it was good to have that. And he was happy to share with us, doesn’t keep it all to himself (Duncan, engineer)

In this case, Duncan identifies the specific knowledge contribution of a worker who possesses individual knowledge not found elsewhere within the group. This worker’s knowledge is recognised as valuable, and is rewarded through access to additional tasks, higher status and opportunities to undertake higher level duties. His willingness to share his specialised knowledge is highlighted.

William describes one of his team:

He is terrific, I’m very fortunate to have him here and he’s worked for this firm since 1975 and he can build these places in his sleep … Someone like him has got a vast amount of knowledge and he doesn’t take short cuts and he knows he can’t (William, engineer)

Specifically, William comments on the importance of this worker’s technical knowledge, and more particularly, his knowledge of correct procedures which informs the high quality of his performance. This knowledge makes him a reliable, trustworthy and dependable source of advice. Highly developed knowledge which has been locally constructed can provide guidance and introduce business or strategy factors of which other workers are unaware. Dennis comments on another worker:

He has a detailed knowledge of what has happened, in what we call the system, the railway system … and he has a very good mind to be able to sort out the
complexities down there. And say ‘that won’t work, because … we are going to have to do that in ten years time’. Other people within TransportServices haven’t even thought about those sorts of things, but he already knows that sort of stuff (Dennis).

In essence, this worker differs from other workers, according to Dennis. This is because of his knowledge of the larger operating system, his knowledge of its history and his understanding of what is required in the future. This makes him especially valuable to the group and is recognised by the group as his unique contribution. Such an instance demonstrates Senge’s (1990b) systems thinking: i.e. the capacity to think and respond at the whole of system or organisation level, to understand interdependencies within the system, and to appreciate the complex web of structures within the system’s functioning. Conversely, however, Todd notes that length of service can be an impediment, if it is not accompanied by flexibility and interest in innovation: “If their attitude on the other hand is very conservative and dogmatic then you don’t get a lot of out it. Even though they have a lot of experience and a lot of expertise you can’t really benefit from it” (Todd, engineer).

Long-serving workers should continually seek to learn, expand their capabilities and remain open to new ideas (Senge, 1990b) in order to contribute to and benefit from their knowledge community and the organisation. If they do not, their attachment to past ways or previous solutions may hinder generation of new ideas and novel solutions. However, Malcolm reports his co-workers’ attitudes as demonstrating continuous learning. He describes a learning culture within the work groups (Bolman & Deal, 2003) as follows: “Everyone’s intention is to be more knowledgeable, gain knowledge” (Malcolm, design drafter).

In summary, the development of the individual worker’s expertise involves a process that develops not only knowledge and skills, but also beliefs and norms of practice about their professional practice. Further, the induction and orientation provided by TransportServices
introduces an overlay of organisational values, to which is added the socially constructed practice of the workplace and the practice of the professional discipline as it is interpreted in the workplace. These are important in providing the framework through which workers understand their responsibilities, job role and the manner in which they should conduct their professional practice.

The key findings identified in this section highlight the links between the deep expertise possessed by individual workers in the specific knowledge domain of railways, and the positive transformational capacity this provides to the work area and larger organisation. This transformational capacity is valued because it is seen to enhance the organisation’s ability to meet its goals, its clients’ requirements and fulfil its purpose. Expertise is, therefore, understood to add value by creating competitive advantage through constructing unique knowledge resources in the organisation (De Geus, 1997; Roy et al., 2001).

A key aspect of knowledge workers’ value is their capability to synthesise and build upon existing knowledge to generate new ideas and innovative problem-solving (Lee-Kelley et al., 2007). In the following section, findings relating to knowledge generation and innovation among the professional and paraprofessional workers participating in this dissertation is presented and justified.

### Knowledge Generation and Innovation

Combinations of differing knowledge, insights upon practice, and innovative solutions to problems can produce knowledge generation, when connections are made between previously unconnected ideas. For instance, existing and proven solutions to problems in other fields of expertise can be applied (Hargadon & Sutton, 1997) in response to a new problem.
Innovation and knowledge generation may be shaped and constrained by organisational, contextual and personal factors, and the requirements for the problem’s solution. In this section, data is presented to illustrate the influence of socially situated factors on knowledge generation and innovation.

*Climate for knowledge generation and innovation*

Organisations can be either generative of innovations or adopt the innovations of others (Kimberly, 1986). A key element of whether innovation or adaptation occurs and whether this is helpful or inhibiting is organisational climate. An inclusive and engaging organisational climate has been found to be positively associated with innovative capacity, which in turn is associated with organisational sustainability (Ekvall, 1996). In this investigation, respondents attributed both negative and positive environmental support for knowledge generation and innovation. For example, James (who is a manager) comments: “I don’t think we do have a conducive environment of suggesting different ways of doing things.”

This respondent indicates that his area’s environment is not conducive of innovation. That is, the organisation’s norms of practice provide a process and procedural framework for task completion and compliance. Such norms of work practice are common within science-based professions such as engineering (Schon, 1991), public sector organisations (Parker & Bradley, 2000), and operational contexts in which safety is a key consideration (Gherardi, 2000). For TransportServices, a public sector provider of passenger transportation services, safety is the uppermost consideration. Hence, proven practices that have been shown to support a safe work and transport environment are privileged.
Alternatives that are not proven to deliver similar outcomes are treated cautiously. For example, in relation to establishing an acceptable level of annual passenger mortality, comparisons were made with road transport norms. One respondent notes: “TransportServices says that’s not acceptable it’s got to be zero” (Todd, a manager).

Generally, fear of unfavourable results can increase pressure to conform to established and proven ways, and avoidance of experimentation and possible failure. For TransportServices, fear that experimentation with new ways could lead to reduced safety levels may act as a powerful inhibitor of innovation. External scrutiny of organisational performance, such as safety performance, through parliamentary questions and reviews and media attention, create external performance pressures which may discourage motivation to experiment with new ways (Amabile, 1983). This pressure, arising from macro-level environmental factors, appeared to shape the bases for information innovation and sharing at TransportServices.

A second issue is implied in Todd’s statement: his comments can be interpreted as indicating that the environment does not support ways that differ from the current ways. Expanding this view, Todd states: “I’ve never heard people talk so much about creativity and planning as I have in this work environment and I’ve never seen so little of it … when someone is creative they get beaten back into submission and compliance” (Todd).

Todd indicates that creativity is discussed, but not actively supported – an example of a gap between espoused theory and theory in action (Argyris & Schon, 1974). That is, where behaviour in relation to an occurrence is at variance with stated beliefs about the occurrence. A climate that supports initiative is held to be positively linked with process improvements and increased performance (Baer & Frese, 2003). Therefore, as a manager, Todd claims that
while creativity is frequently mentioned, the exercise of creativity in the form of suggestions or design work which differ from accepted practice, may result in pressure for compliance to established routines.

Pressure for conformity is an example of political behaviour arising from workers resisting changes to established work routines (Mumford, 2000). Similarly, resistance to suggestions of ‘new ways’ can be based on characteristics associated with the originator of the new idea, such as the history of their reciprocal interactions within the group (Thompson & Heron, 2006), the strength of the group’s sense of identify and adherence to group norms (Breu & Hemingway, 2002), or the previous outcomes of innovations (Perry-Smith, 2006). However, lessened risk in volunteering new ideas has been identified by Edmondson (1999) and West (1990) as associated with higher performance.

Closed workgroups are associated with pressure for conformity (Leonard & Sensiper, 1998; Starbuck & Milliken, 1998). The workgroups participating in this research largely comprised stable populations of long serving members, operating within a workplace that has well established cultural (i.e. disciplinary-based) and institutional (i.e. public sector) norms. The findings suggest that contested workplace relations, when they are seen as questioning these norms, negatively influence the development and presentation of new ideas and alternative suggestions, in the TransportServices groups in this study.

Some respondents described the conformist environment as arising from the role of the Standards. For example, a supervisor describes their regulatory role: ‘…that’s the procedure and that’s the rules.’ His comments are contrasted with those of Roger, a manager with more than 20 years’ service:

Standards drawings etc may achieve the status of documents that can’t be challenged, even when they are superseded. They must be updated and challenged
when needed to ensure they are still appropriate and correct. … People think that if something is documented at all, there is no need to revisit it

What is implied here is that, unlike the supervisor, this manager fully understands the role of the Standards: although providing guidance for practice in the workplace, they are able to be challenged. Importantly, he suggests that for practices to be valid and useful they require updating to ensure currency and correctness, and avoid becoming outdated. This sentiment is expressed by another staff member:

There always will be areas that are not on that check list. Now the problem that I find with that is that it takes away a number of things. It takes away responsibility of a task, it takes away initiative all right, and it takes away incentive. These are all going (Cameron, design drafter).

This view represents an example of the disconnections between frames of meaning at different organisational levels discussed previously, resulting in inappropriate actions or lack of action at lower levels (Pope et al. 2006). For Roger, the Standards not only are capable of being challenged, but indeed should be challenged to ensure correctness – their preservation in documented form should not prevent new or other ways from being explored. For Cameron, the Standards appear to stifle creativity, initiative and a sense of personal responsibility for task achievement. For the supervisor, the Standards represent rules to which designers must adhere. So, the imperative of advancing ideas and maintaining workplace norms are played out in distinct ways through these workers in their engagement within the same organisational macro-level environment.

Incentives to revise workplace norms and identify opportunities for innovation may arise through challenges from external sources:

… because we’re not competing in the market place with different projects, we’re just working our own projects, it is important to get some external influence and checks, because you learn with people coming back with different questions, and say why are you doing it this way, it doesn’t make any sense, and then suddenly
you have to think about it, and they say ‘Oh yes, they’ve got a point’ (Todd, engineer).

Where task accomplishment involves interaction with external sources, opportunities for innovation and knowledge generation may arise. Free from the compliance with internal procedures and historical approaches, external agents such as contractors may stimulate review of current methods and ideas. Contact with external sources can interrupt a pattern of primarily consulting with local sources which may result in reduced innovation (Zellmer-Bruhn, 2003). Perhaps, growth and competitive edge may be inspired by identification of anomalies (Katz, 1994; Kuhn, 1970), leading to new adaptations. James, an engineer who is also a long-serving manager, identifies the learning potential and constraints:

I think also there is a flow of knowledge back into the organisation about how people do things differently. But that only flows back in if you have time to consider that. And when you’ve got a lot on I don’t think that time is being spent to capture some of the great learnings (James, engineer).

Certainly, pressure of work reduces time available for reflection on practice, exploration of fresh idea combinations and possible new solutions – essential for examining and integrating diverse perspectives into current work routines and problem-solving (Schon, 1995; Sidmonton, 1999). James highlights his concern that opportunities for organisational learning cannot be pursued due to the workload pressure. So, work demands and deadlines may reduce opportunities for knowledge generation arising from collaboration with external sources (Amabile, 1996; Cohen & Levinthal, 1990).

Individual workers describe a capacity for introducing personal creativity into their own work practices, as Angus, Nick and Barry suggest:

Everybody will actually introduce their own thing into drawings, their own flair, however, for them to actually do that they have to have a solid foundation on what is required in civil railways, and then they can actually start to put in their own little things (Angus, design drafter).
Every now and then you might come up with something clever … With most of our work it’s really just engineering by the numbers, so to speak, water always runs downhill there’s nothing you can do about that. So your concept stage is really when you can develop something a bit new (Nick, engineer).

We’re the primary, the first person there doing the drawings … co-ordinator of design (Barry, engineer).

Implicit in these respondents’ comments are the attention to the discipline and openness to alternatives outside the existing practices that is characteristic of creative people (Mumford, 2000). Angus claims, for instance, that the creativity results from sound knowledge of railway requirements, to which creativity can then be overlaid in the design drawings which are advanced through his sense of personal flair and personal style. Nick and Barry, as engineers, originate the overall design concept for others to execute. Given the parameters of their work in dealing with objects and forces, they articulate a sense of design creation and ownership. This suggests that the macro-level norms and practices act to shape their thinking and acting and the generation of their responses, but do not wholly constrain them.

On a group basis, the following example of innovation and openness to learning is described:

The (urban busway) project. That involved a number of designs that we have never done before and what I did with that was to share that around and got everyone to do parts of it. That was an example really where everybody learnt something out of it and everybody was involved in all the designs because it was fairly tricky (Duncan, engineer).

In sharing the design task around and involving everyone in the group, this engineer (who is also a supervisor) describes actions designed to create an environment supportive of creativity, continuous learning and innovation. In this way, he reduced the risks of introducing new ideas and established a climate of psychological safety for experimentation, factors
associated with higher levels of creativity and innovation in organisations (Baer & Frese, 2003).

However, focusing on enhancements of existing systems can lead to micro-level adaptations, rather than new developments (Henderson & Clark, 1990). In a less positive vein, novice workers can introduce difficulties into the work process through inappropriate innovations:

A cadet started to introduce their own little flair into the drawings but it was really frustrating because … you put the drawings together and all of a sudden you see that the technical side, what the senior people have done correspond, but the cadet stuff is completely different. We’ve got two drawings here that are exactly the same but they’ve don’t match (Angus, design drafter).

In this situation, the exercise of creativity occurred through the inexperience of the cadets, who lacked knowledge of process issues embedded in the organisational work routines (Haynes, 2006). It reflects the interplay between the personal and institutional, and how they are negotiated and come together. Perhaps, the cadet’s failure to represent their ideas in a way that respected the institutional norms was a major concern here, not the innovation itself. These work routines require matching outputs to ensure that technical drawings are consistent. Due to their inexperience, the cadets lack the practical, contextually constructed knowledge of workplace procedures (Patriotta, 2004) which their cadetship is designed to provide over time as their railway and organisational knowledge is gradually developed. This example is important as it underscores the situated nature of knowledge and expertise development in TransportServices.

In summary, given TransportServices’ goal of becoming the dominant operator in its field, (which includes a predominant concern for safety), the pressure to conform and observe established protocols may result in stifled initiative and reduced performance improvements. An organisation’s ability to develop improved knowledge is influenced by some factors which
are political in nature. For instance, the attitude of the manager towards experimentation and the discretion to question accepted norms may influence the extent to which workers adhere to customary procedures, even when the procedures do not rest upon regulatory or safety bases.

Successful implementation of new knowledge and innovations is a complex process in which the new ways are integrated within existing procedures and the work routines of group members. Adoption by other workers likely depends on legitimation and support from the manager, and is more successful when managers are established and experienced (Finkelstein, 1992; Mumford, 2000).

Managers with favourable attitudes towards innovation may be those most likely to allocate resources and develop structures and administrative procedures which facilitate adoption of new knowledge (Damenpour & Schneider, 2006). In the following section, data collected in relation to knowledge leakage are presented and discussed.

Knowledge Leakage

Competitive advantage has been associated with deep, specialised knowledge of the field. The advantage derives from the unique combination of knowledge and personnel resources which constitute an organisation’s market edge (Damanpour & Schneider, 2006; Tushman & O’Reilly, 2002). For market place benefits, the knowledge must be retained within the organisation so that its special nature is apparent to potential customers. However, knowledge leakage can occur without an organisation’s awareness, reducing its ability to differentiate itself in the market and to sustain its service delivery to current customers. In this section, findings related to: (a) the impact of knowledge leakage, (b) ways of reducing
knowledge leakage, and (c) knowledge leakage as an impetus for change in TransportServices, are presented and discussed.

**Impact of knowledge leakage**

But the consequences of sourcing people outside to do their project and then let them go is that you would lose a lot of history. And often you will just get a body, a civil engineer, a project manager to fill a role. You don’t have a knowledge of TransportServices, of TransportServices systems, of people involved, the history, any parallel projects, any proposed parallel projects, consequences of decisions (Robert, engineer).

The depth and scope of knowledge within the professional and paraprofessional groups is identified by Robert as a valuable resource which contributes to current and future success. Most importantly, Robert and Barry (see below) identify long service history and personal experience as a reservoir containing the thinking behind projects, designs and decisions and knowledge of the outcomes and impacts of decisions, both positive and negative – i.e. the lessons learned (Feldman & Feldman, 2006).

Someone who has to do that work is at a major disadvantage. They have to go on-site, to pull up the drawings, they might not find all the drawings in the database because … titles of databases change … They might not understand why things are done in a certain way, they have to ask someone if that was done, why that was done. You lose that sort of tangible thing and it impacts upon the speed in which you do things. Confidence of saying ‘well, I know the site the cost continuance should be about 20%’. If you don’t know the site, not been in the site and you ask for the estimate you might be hustled to 30 or 40%. That is the biggest difference. (Barry, engineer).

Barry indicates that lack of historical knowledge about projects can lead to unfavourable economic outcomes. Without that knowledge base, negotiation process may result in unfavourable outcomes for TransportServices. The extensive knowledge of past work facilitates speed of access to project and design records. Within that extensive knowledge base exists a record of not only the projects and designs, but their relationship with other projects.
and events and the consequential impacts of parallel projects. In short, the organisational
meaning of the events reflects the importance of the contextually constructed nature of the
organisational knowledge (Alvesson, 2004).

They don’t I guess, appreciate how valuable that knowledge is. They can ring us
up and we can have someone there in an hour or so that knows. The item that they
might be dealing with might be 15 years old. Most of us know what went on 15
years ago and why it is, but the outsourced people would have no idea of the
history behind things. I just don’t think if you outsource it you would get the
quality of job that you would get now. In TransportServices I guess we’re paid for
that. We’re doing work for another company, another national railway system …
and they did exactly that and now they are struggling to get people to do the work
for them. It is a real mish-mash for them. That is just a clear example of what
does happen when you get rid of that expertise (Duncan, engineer).

Duncan argues, firstly, that the length of service has created a core of workers with
deep knowledge of the operations and past projects that has a value which ensures quality,
continuity, and support to the organisation’s operations through expeditious problem
resolution. Secondly, he claims that outsourcing the work would place it with consultants
lacking the depth and scope of knowledge constructed over time within the in-house group.
Thirdly, he describes the results in a similar railway operator which outsourced this work. The
operator has subsequently lost the internal expertise and struggles to find external consultants
to carry out its design work, due to the small pool of specialised rail expertise, as described
earlier. Duncan questions whether the value of the locally situated and carefully constructed
expertise which has been developed is appreciated for the unique contribution it makes to
achievement of TransportServices’ business goals.

So, TransportServices possesses expertise, documents and practices which constitute a
rich history, contextualised knowledge resource and a deep memory of events, success and
failures to access for its operational needs. The constructs of ‘history’ and ‘organisational
memory’ have been aggregated as ‘organisational remembering’ by Feldman and Feldman
who describe it as a ‘collective, historically and culturally situated practice enacted ...to establish meaning’ (p. 880). This organisational meaning is important for their competitive edge and sustainability: through the social practice of remembering, workers are able to draw on their individual and combined history to recall past practice, successes, errors, processes, and opportunities not realised, which in turn provide a platform for identifying new, improved practices (Feldman & Feldman, 2006). Engineers and design drafters draw not only upon the Standards and design database, but also on the knowledge of processes and practices behind the Standards and designs.

You look at the Standard and you go ‘why was that done … We got all the designs, strategies built around that Standard, now we’ve got to consider changing that – what is the implication of that’. It is not knowing why things are done. It might have been done for a very good reason. It might not have been. (Barry, engineer).

Questioning and review of current and past practices is essential for continuous improvement. However, when the reasons for those practices are not accessible, time and other costs may accrue through repetition of past errors or experimentation. Conversely, when the knowledge is present in key individuals and the collective knowledge of the group, access to similar situations and learned expertise is facilitated:

They will refer back to a previous job …they will take us through and say ‘well this is what happened, this is similar to this – let’s apply the same theory and if it works or if it doesn’t work we will learn something out of it’ (Gerald, trainee).

Thus, new designs and solutions emerge from past successes and mistakes (‘the consequences of decisions,’ Robert). In this process, new knowledge is generated. Novices and experts alike contribute to and benefit (‘we will learn something out of it,’ Gerald) from the knowledge generation process, as suggested by Hargadon and Sutton (1997). Interestingly, Barry and Gerald describe an attitude of continuous learning which is not always associated with length of service but has been found to be a characteristic of experts (Ericsson &
Charness, 1994). Further, their comfort with ambiguity and uncertainty (‘if it works or if it doesn’t’) is typical of experts (Fores et al., 1991).

In this way, accompanying the knowledge generation and sharing processes, the organisation’s values, moral traditions and beliefs are reinforced to existing workers and communicated to newcomers, through evidence of their enactment and interpretation over time and circumstance (Watson & Werhane, 1997).

The young people you know, the Generation X, even Y, they just don’t see the world the same way. They come here to get some training on something and they move on. They have no attachment to the place ... A long history with the organisation can be very valuable (Todd, engineer)

Therefore, ‘local knowledge’ (for instance, knowledge which is dynamic and specific to the organisation) has been identified as a key ingredient in organisational effectiveness (Blackler et al., 2000; Yanow, 2000). However, as Todd describes, intergenerational relations can provide an unintended barrier to knowledge sharing, where perceptions of lack of commitment can reduce an experienced willingness to share their personal knowledge. The manager’s comments (“They come here to get some training on something and they move on. They have no attachment to the place”) reflect his observations about the commitment of younger recruits that will shape and mediate his knowledge sharing orientation, and subsequently, his knowledge sharing practice with new recruits. Considering the age profile of the groups under investigation, the nurturing and enculturation of new recruits requires attention to protect the knowledge resources of the organisation and group.

The impact on productivity arising from knowledge leakage is seen to represent a potential cost should expert knowledge be lost. A supervisor describes the importance of firstly, the speed at which work can be carried out by knowledgeable, expert workers, and
secondly, the importance of the contextualised, historical knowledge surrounding past work which does not appear in official designs, reports or records:

I think the real immediate impact is just the quickness in which someone can do things … all that knowledge goes. But someone who has to do that work is at a major disadvantage … I have visited some of these sites with other guys in the office who designed them, know where all the drawings are, visualise them and call up information that others would not be able to find or know and even if they went to site, they would not have the full knowledge (Barry).

This supervisor highlights the losses that occur when knowledgeable workers leave: the completeness of the group’s knowledge (i.e. the practical skills), and the contextually constructed knowledge particular to sites, projects, processes, impacts and outcomes. The loss of heuristic knowledge affects not only the work of others in the group, but the organisation’s capability to provide speedy design solutions. Similarly, where knowledge resides among the group, Tsoukas & Vladimirou (2001) suggest ‘historically evolved collective understandings’ are the knowledge resource. Individual contributions form complementary elements of the jigsaw of collective remembering and meaning:

A lot of the knowledge … is not just with one person it is within the organisation but it is … a matter of trying to find it. Rather than trying to go to the one person to find the knowledge you probably have to go around to a number of other people to try and find it. So the timeframe to get that knowledge would be greatly expanded (Malcolm, design drafter).

Knowledge leakage through loss of expert group members, therefore, is seen as having greater impact than loss of an individual’s own expertise. It simultaneously reduces the collective knowledge and contextual history, especially in regard to knowledge that is informal and not recorded in past projects or designs.

Similarly, Barry suggests that emphasis on multi-skilling and job rotation will impact negatively on continuity and knowledge sharing:

There used to be one person who did all this and because he was doing it on a frequent basis, he could process 90% of the applications without even sending
them to us. The current philosophy is to have people do multiple things … We might be looking at five or six people throughout the state who do that. Day-to-day they rotate through so it makes it difficult sometimes when you get a new person and you start from scratch. That’s why I mention it because in the organisation itself, in your own section it’s easy to communicate information rather than communicating outside … technical to non technical can be very difficult (Barry, engineer).

Barry identifies several factors: (a) the initially negative impact on productivity through dispersing the work previously undertaken by one worker, (b) the frustration of dealing with a new person who lacks the knowledge base about the project developed with the previous person, (c) the time wasted in again providing essential information, and (d) discontinuities caused by differing bodies of knowledge and specific language associated with a field of expertise. In contrast, however, job rotation may also develop and facilitate knowledge sharing, as the knowledge which was previously held by a single individual becomes held more widely within the knowledge collective.

In turn, the organisation’s dependence upon an individual worker is reduced, making it less vulnerable to loss of valuable knowledge should that individual leave the organisation’s employ, and more competitive. Therefore, the amount of effort and time required to find relevant knowledge is a transactional cost to TransportServices that can be reduced by valuing, protecting and extending organisational memory, through proactive knowledge sharing encouragement (Walsh & Ungson, 1991).

In light of increasing use of contractors and consultants, the value and benefits of the extended service history and resulting knowledge pose important questions for more senior management. For instance, the situations described below by a manager and a design drafter indicate potential losses of high level professional expertise, TransportServices’ knowledge, organisational capability and diminution of competitive edge through knowledge leakage to contractors:
There is information which is passed outside the organisation which may not necessarily be in our best interest. I’m not saying there is anything terribly dangerous or whatever, but some leverage or opportunities we would lose because of that information being mishandled or passed on too early or to a person who should not really be aware of it. And that is the risk when you work with too many contractors (Barry, engineer).

With consultants we are concerned that we are giving them a competitive edge by virtually training them into … specialised knowledge of the railways … So giving them the competitive edge might mean the loss of our jobs … management will say well we don’t need you any more (Derek, design drafter).

These respondents link the provision of specialised knowledge about railways to consultants to a dispersion and reduction of TransportServices’ unique market competitive edge. Derek expresses concern that development of a community of external, skilled rail practitioners may result in TransportServices management outsourcing their design requirements. As a consequence, he and his colleagues would lose their jobs or have to shift to a different form of employment (e.g. external consultancy). So, increased use of contractors and consultants, even where workers have observed numerous instances of consultants transitioning into permanent employment with TransportServices, heightens current workers’ feelings of insecurity about their own employment prospects.

Sounding a warning in regard to increasing reliance on consultants’ work and his area’s capability to effectively manage consultants’ work quality, Dennis suggests:

We will be more exposed to the limited technical knowledge and ability of the consultants and consequently, I think things will cost more in the long-term, be it in the construction, shortcomings in planning for the construction, or in the longer-term maintenance (Dennis, design drafter)

Thus, Dennis sees the situation in terms of inadequate service delivery by the consultants, potentially creating reduced service delivery and increased costs for TransportServices.
Assuming that information requirements are merely a functional need satisfied by a rationally derived and executed process is simplistic (Feldman & Feldman, 2006). Where inadequate organisational knowledge exists and fear of lost status through asking experts is a factor, (e.g. in the case of contracted consultants or newcomers to the organisation), decisions may be made on the basis of information most easily accessed rather than what is most reliable and proven (Ackerman, 1998). This basis for access is due to the socially constructed and relational issues which this dissertation proposes influence knowledge generation and sharing practices, and hence, an organisation’s performance.

**Reducing knowledge leakage**

Attention to organisational knowledge can assist organisations to retain their competitive edge through maintaining key intellectual capital and human resources (Collins & Smith, 2006; Tsui et al., 1997). Respondents identified two specific knowledge leakage issues of concern, firstly, the importance of retaining expert workers of particular value to TransportServices, and secondly, practices they believe will reduce knowledge leakage.

Respondents described the importance of retaining expert workers in terms of their detailed, unique technical knowledge and their deep contextualised knowledge, for example:

> And with all that knowledge in (Barry’s) head, because it is there and not written down, you can lose all sorts of things. You can be thrown in a bit of a disarray. Our section in particular will be in big trouble if (Barry) ever went somewhere else. We’d lose three quarters of our technical knowledge, easily (Nick, engineer).

> He is very valuable not just to us but the whole organisation. He has a very deep knowledge of that work … anywhere in the organisation. He has been identified as a position that is critical to the operation of the organisation (Malcolm, design drafter).
In discussing the potential impact of losing the same individual, a supervisor noted: “It would have a big affect on our section. Loss of morale, as well I think, certainly the flexibility that he gives us we would lose.” (Duncan).

These workers’ value is clear to their peers. In one case, a respondent believes that the organisation is aware of an individual worker’s value to the organisation. Identification of key knowledge resources allows an organisation to implement supportive human resource management (HRM) practices. For instance, these practices can ensure knowledgeable workers are recognised and rewarded appropriately and included in knowledge sharing activities, (e.g. leading projects, mentoring, coaching, special status or other training activities). In particular, special efforts should be undertaken to retain their services and contribution. However, in large organisational settings and competitive market contexts, organisations may not always be responsive to individual workers’ situations.

Further, public sector pay frameworks may not be sufficiently flexible to provide unique compensation arrangements for valuable individuals. Frustration with the slow response to knowledge leakage when a valuable worker left the organisation was expressed by Cameron, a design drafter with more than 20 years’ service:

We had a similar PO5 leave about three months ago. Nothing was particularly done to say tempt him to stay. Nothing was really done to try and say – once they knew he was leaving, there was no work done, for example, succession plan type scenario. We say right ‘this PO4 or this PO4 you’ll pick his brains for the next three months’. Which I would have thought would be the first thing you’d do … He’s been gone for three months and now they are looking for someone to replace him. It does beggar belief sometimes (Cameron, design drafter)

In the view of this respondent, insufficient action was taken to attempt to retain a valuable worker. Further, no actions were taken to garner the benefits of his experience and knowledge through allocating other staff to work with him, actions which are self apparent to the respondent.
In a similar vein, Nick describes the loss to a consulting firm of a younger worker who was part of a group which received an award for an introduced innovation as part of TransportServices’ reward and recognition scheme:

We had a young fellow that was one of the recipients of the award ... He was a very very dynamic individual…. he made some enquiries outside and the money was such that they couldn’t match that here and he left. Now the interesting thing is that we have now work for a consultant that we don’t do in here and that fellow is working for that consultant. And that fellow is doing that job (Nick, engineer).

In this case, the departure of the worker was not only disappointing for his work group, but left a skills gap that could not be filled internally. The same worker is now contracted to carry out the work as an external consultant on a higher rate of pay – a demotivating outcome for his former colleagues. Job performance, satisfaction, commitment and intention to leave are closely related (Ashford et al., 1989; Rosenblatt & Ruvio, 1996; Yousef, 1998). The national rail industry is a small domain of expertise and operators, as previously noted. Hence the identity of professional and paraprofessional staff whose talent, knowledge and job performance are out of the ordinary becomes apparent to members of the profession outside TransportServices. The appeal of the rewards available in the outside market in a specialised field of knowledge were noted by Cameron, who sounds a warning: “People are being offered significant … increases in pay to do work outside” (Cameron, design drafter).

Organisations are not always aware of the level of costs associated with employees leaving their jobs, for instance, the costs in recruitment, training, administration of the process, and the loss of valuable knowledge (Harris, James & Boonthanom, 2005; Hom & Griffeth, 1995). In a dynamic field, where expertise is confined, ideal conditions for ‘poaching’ of good workers by competitors or suppliers of specialised services occurs (Capelli, 2000). However, human resource management practices which encourage and build commitment have been associated with improved long-term performance in service
organisations (Batt, 2002). Dennis reports an example of special expertise being individually
rewarded but notes the sluggish approach to valuing knowledge involved in the organisation’s
response and processes:

And a lot of people, good people in TransportServices recognise his foresight and
that he is why he is held in quite high regard across the organisation. He also got a
pay rise recently, a promotion – which was good to see. It took 3 years to get it
there for him, but he got it (Dennis, design drafter)

Suggestions for reducing knowledge leakage were made at macro and micro levels.
Duncan recommends a documentation process:

Things are a lot more documented now than what they used to be. We have design
manuals and things like that, whereas in the past we probably didn’t have, and that
was probably in people’s heads. We try and get things written down more so than
probably ten years ago. That is probably one way of getting information out of
them (Duncan, engineer).

The documentation and recording approach has been found to capture data and
information effectively. Respondents supported organisational efforts to capture and record
past practices and achievements (for instance the Standards, design library, establishment of
extensive intranet networks and use of email). Other respondents, however, were conscious of
the expertise and individually constructed knowledge not captured through these means:

When he left it was .. ‘before you leave you’ve got to write all this information
down’ … but people never get time to write down all the information that’s in their
brain (Tom, engineer).

You can only pick up a certain amount of other people’s experience. Probably the
surest way of doing it is to try and maintain a steady flow of people. While one
person is rolling out a person is coming in (Robert, engineer).

Robert suggests the use of more strategic recruitment and rotation practices to
maintain a more even flow of employees entering the area. Rather than recruiting only on a
needs basis, (which in practice means that recruitment is reactive and spasmodic), he suggests
that recruitment should be a continuous, planned process to meet future needs for workers
trained in rail and the ways of TransportServices. As previously identified by Robert (e.g. ‘there’s quite a long development time’) and Gerald (e.g. ‘they say eight years generally if you are on the ball’), rail training involves a significant lag in training time. Such a process would distribute length of service more evenly and avoid key professional and paraprofessional workers reaching retirement age in groups, with the attendant knowledge loss.

Adding to Robert’s proposal, Tom and Angus suggest that desirable knowledge sharing outcomes will probably be achieved through creating planned situations in which workers with expertise will work with other workers in an organised process to share what they know:

You know you can’t think of all the information that’s in your brain. It’s huge. And it only comes to mind when you get asked … the question (Tom, engineer).

It’s all intellectual knowledge, it’s very hard to put it on paper I think. The only way you’ve got to pass it on is by actually working with the person (Angus, design drafter).

The process described by Robert, Angus and Tom would allow less knowledgeable workers to work alongside, question and benefit from the breadth and depth of the valuable workers’ expertise. In working together over time across a range of projects, deeper knowledge sharing should occur, as proposed by Collins and Smith (2006).

In this way, the impact of future resignations will likely be less, and the pool of workers trained in rail and TransportServices’ requirements will meet the organisation’s needs and the retention of organisation-specific knowledge (Collins & Smith, 2006). Hargadon and Sutton (1997) recommend planned, regular re-forming of teams to ensure workers ‘are exposed to the diverse knowledge held by their co-workers’ (p. 744). Further, they suggest this process will entrench norms of knowledge exchange, helping behaviour, and a climate of psychological safety for asking questions. This is important for the present investigation, as
the development of such helping norms fosters a climate of knowledge sharing. It should be noted, however, that individuals may alter the composition and use of knowledge to suit their own context and problems, selecting and interpreting it to enable achievement of their own objectives (Golden-Biddle, Locke & Reay, 2002).

In addition to generating new knowledge for the organisation, individuals create their own knowledge relations with others within the framework of their own knowledge sharing norms (Van de Ven & Johnson, 2006). Individual knowledge sharing norms, however, are influenced by other factors as described in the following example:

… surprise at his recalcitrance: ‘you are leaving the organisation, you’ve had years of experience would you like to create a few little workshops etc,’ … ‘you’ve been doing lots of stuff over your career and done lots of mentoring of people, would you like to do that in the last two months’ – it was a bit of an effort to do so, so he didn’t (Dennis, manager).

In this case, this manager describes how an exiting worker was asked to conduct some knowledge sharing workshops with other staff prior to his exit from the organisation but refused to do so. The manager expresses ‘surprise at his recalcitrance’ as the exiting worker had accumulated considerable rail experience and knowledge through his TransportServices employment. This worker had previously demonstrated knowledge sharing behaviours through mentoring others during his length of service. However, as there was no organisational policy or procedure requiring compliance with the request to conduct knowledge sharing workshops, the manager did not pursue the issue.

In summary, respondents emphasise the key facets of expert knowledge: the capacity to reason, analyse and draw conclusions from information (Davenport & Prusak, 1998), reflect and arrive at judgements, assess and make high quality decisions quickly (Brunsson, 1985), make sense of ambiguity and apply contextually accurate understanding to solve complex workplace problems (Alvesson, 2004). Combined with deep understanding of the industry and
organisation, this knowledge is locally constructed and situated through the practice of the profession, and association with the professional and paraprofessional groups of knowledgeable practitioners. Knowledge sharing appears to be dependent upon goodwill and individual temperament.

However, it is the ability to create new combinations of existing and new knowledge to deal with problems which present differently combined challenges, and the social norms of knowledge sharing that are learned through working with others in a planned process (Collins & Smith, 2006). Such processes facilitate the use of narratives between workers: useful because narratives have been identified as key diagnostic tools which contribute to organisational memory, group stability, and ‘foster the circulation of organisational knowledge’ (Czarniawska, 1997; Gabriel, 1998; Pacanowsky & O’Donnell-Trujillo, 1983; Patriotta, 2004, p. 9). The trainee programs discussed previously have been developed to build expertise and provide future inflow of junior workers into the skilled ranks. The lead time involved, however, suggests a need to incrementally recruit less junior (for instance, mid-career) professionals and paraprofessionals into a planned knowledge sharing process as soon as possible, to reduce knowledge leakage through normal attrition, poaching by consultants and retirements of key workers.

Knowledge leakage as impetus for change

Knowledge leakage can create impetus for review of current operations and ways. Where a component of the current system (e.g., the expertise and input of a member of the workgroup) leaves, adjustments will necessarily occur creating opportunities for improvement, promotion or organisational evolution:
There is a loss ... of course. Different solutions, you know, like we have a system that works well in this way and you lose a key element of that operation, you basically have to change the operation and find an alternative way to achieve or arrive at a similar solution. Sometimes it's more cumbersome, sometimes it’s more cumbersome for a period of time and then becomes more efficient. If you don’t change something (that) is working you don’t tend to ... challenge what’s working (James, manager).

This manager describes a process in which the initial loss of expertise leads to the development of other ways of thinking in order to carry out the task requirement. Organisational memory is disrupted (Guzman, 2005). The discontinuity in the established order, therefore, leads to a re-definition (Patriotta, 2004) and innovation occurs. Thus, knowledge generation can result from the loss of expertise caused by knowledge leakage. Additionally, if newer workers are entering the area, as suggested by James, more frequent questioning and review of current operations (‘challenge what’s working,’ James) may occur from the input of the newcomers. This kind of review is an important outcome of the knowledge sharing process, as newcomers are more likely to question processes during the training period as they attempt to learn the locally constructed procedures and processes of their job tasks. Once socialised, the influence of newly acquired organisation and work group norms may negatively influence their willingness to question established ways (Jones, 1986; Van Maanen & Schein, 1979).

Another manager addresses knowledge leakage from several different perspectives:

We would hopefully have enough depth for someone to move into their shoes. Or that the role could be redefined so that there was enough width or breadth in the organisation to accommodate that. If that wasn’t the case we would have to see other means of providing the service or alternatively not provide that capability. And we would then seek to evolve the organisation itself in some way. We have in recent years evolved the organisation as technology has come along, quite considerably, and we will continue to evolve (Dennis, manager).

A range of alternatives has been generated, avoiding the ‘single outcome trap’ (Thomas, 1988). Firstly, the organisational requirements are identified, i.e. sufficient depth of
personnel and knowledge resources for another worker to step into the vacant role. Such situations can, therefore, be interpreted as both indicators of human resource management processes operating effectively, and as providing advancement opportunities for other workers. Secondly, the loss of expertise could be met through re-definition of the role, tasks or project in order to be met. If existing knowledge resources are insufficient, the third option is to provide the knowledge through other means (for instance, use of technological access to other sources of that knowledge, or contracting consultants to provide the knowledge). The fourth option is the decision to not possess that particular knowledge and to, therefore, change organisational and task processes to account for that knowledge no longer being held by the organisation.

These managers demonstrate pragmatism and openness towards changes which may depart from existing practices. They are favourably disposed towards reviews of current practices in order to continuously improve and evolve, attitudes typical of managers with more strategic level thinking and confidence in the future, which have been found to support innovation (Mumford, 2000). Managers’ positive attitudes to innovation positively support innovation adoption (Ekvall, 1996). Bottom-up innovations arising in technical areas (for instance through experiments with and adaptations to processes) rather than in administrative areas, are common for technical groups (Daft, 2001). Engineers and design drafters are technical experts, and as such are likely to initiate bottom up innovations due to their interest in learning and willingness to explore new solutions or combinations of technical knowledge to problems, as evidenced in the present study.

Such on-going initiatives and adaptations are important, as very stable environments where change is infrequent may decrease ‘the repertoire of routines’ used and remembered by
individual workers and groups (Nelson & Winter, 1982). Reduced flexibility, adaptability, capability and creativity decrease an organisation’s capacity to respond innovatively to changed competitive environments (Collinson & Wilson, 2006). However, pragmatic responses to loss of unique knowledge resources may act against the organisation’s unique market positioning and hence its competitive edge. Without proactive strategies to safeguard and build knowledge capability, organisation performance has been found to diminish (Smith et al., 2005). Hence, pragmatic responses may be counter-productive in the longer term. This is important in the present investigation, where knowledge generation through innovation may provide a basis for economic growth and market advantage (Damanpour & Schneider, 2006), and assist TransportServices’ drive to become the dominant rail freight operator.

Conclusion

This chapter has presented and discussed findings illustrating the knowledge sharing practices of the professional and paraprofessional workers at TransportServices. It presented data extending and developing the a priori constructs discussed in Chapter Three. The findings are depicted in Figure 7.
Figure 7 summarises the socially constructed values and practices providing the framework for knowledge generation and sharing action on a day-to-day basis, which emerged from the data presented and discussed in this chapter. Firstly, evidence was advanced demonstrating how induction and training programs are used as socialisation mechanisms for the development and sharing of socially and locally constructed knowledge and professional expertise. These programs serve to communicate organisational policies, practices, norms and values. They foster the development of rail engineering and design expertise. Importantly, they provide mechanisms for locating trainees within important social and situated knowledge practice sites, thereby facilitating novices’ role and relationship negotiations.

Secondly, data was presented demonstrating ways in which information is accessed and gathered for role and task execution. The importance of communication and interpersonal relations was highlighted as central to maximising problem solving outcomes and knowledge acquisition. This is because they enable problem re-framing and knowledge generation by facilitating consultation with knowledgeable others. Further, they create access to
organisational and locally situated memory, values and identity. Thus, more knowledgeable workers serve, therefore, to supplement traditional and electronic information management means.

Thirdly, the findings suggest that knowledge sharing is facilitated by social interactions and an environment which enables collective knowledge generation and sharing opportunities. These opportunities were found to have political characteristics reflecting the influence of contested workplace relations and the value attributed to knowledge and expertise. Differences in value systems, power relations, group memberships, individual and group norms and beliefs, and differential access to resources, such as information, were reported to create political dimensions to knowledge generation and sharing. Knowledge sharing will likely be facilitated by work environments where: (a) organising structures facilitate interaction and knowledge flows, (b) value is attached to learning and development, (c) continuous improvement is encouraged, and (d) willingness to share expertise is expected, in order to create organisational knowledge.

Fourthly, findings demonstrating the influence of personal and situational factors on organisational innovation and knowledge generation were elaborated. Pressure for conformity with proven methods was demonstrated to arise from relational factors, the existence of documented standards and regulations, and the technical nature of the engineering and design drafting fields. Innovation is encouraged by the nature of the project work which includes new and challenging tasks, requiring openness to alternative or new solutions. These findings highlight the transformational capacity arising from the depth of knowledge and emotional engagement of the respondents with their rail field. The data illustrates this capacity to be of
significant value to TransportServices through the unique knowledge resources which provide innovation and competitive edge.

Finally, findings illuminating the impact of knowledge leakage and means of reducing this impact were presented and justified. Concerns were expressed by respondents in regard to potential knowledge leakage due to the increased use of external consultants. The external contractors were claimed to increase the workload of permanent staff required to monitor and supplement the work of external consultants. Providing contextualised task knowledge and history was claimed to be knowledge sharing that was not reciprocated.

Respondents expressed concern that the value and extent of the specialised knowledge developed over long employment histories by workers within the area may not be appreciated by senior management. Concerns were also expressed that forthcoming retirements will diminish the contextually constructed understandings which have evolved at the local workplace level through these extensive work histories. This evidence suggests that without attention to strategies to safeguard and build knowledge capability, the organisation’s future performance and ability to respond to increased service demands may be reduced.

In the following chapter, data illustrating the influence of micro-level mediators in individual workers’ knowledge generation and sharing are presented and discussed.
CHAPTER SEVEN
MICRO-LEVEL MEDIATORS ON INDIVIDUAL WORKERS’ KNOWLEDGE
GENERATION AND SHARING

This dissertation proposes that knowledge generation and sharing are mediated by the relations between individual workers and the organisation, and the relations among workers. Following the presentation of macro-level influences and socially situated practices in regard to knowledge generation and sharing in Chapters Five and Six, this chapter describes the influence of micro-level factors. It builds upon the concepts presented and discussed in Chapters Two and Three to propose a framework for identifying key influences in organisational settings that shape individual workers’ orientations to practice and behaviour.

The dynamic nature of TransportServices’ business environment has been established in earlier chapters. This is important because in dynamic business environments organisations develop market advantage from their unique combination of resources and worker skills (Grant, 1996). These are essential for the ongoing development of the organisation’s capability to meet market demands (Szulanski, 1996; Zahra & George, 2002). In this chapter, the influence of micro-level factors upon knowledge generation and sharing are identified and described. Their salience arises from their impact on individual workers’ preparedness to contribute to the collective knowledge of the organisation, through sharing their own knowledge with their colleagues, and supporting exploration of new ways which generate new knowledge (Hinds & Pfeffer, 2003).

The chapter is structured as follows. Firstly, data illustrating the participants’ characteristics and orientations are summarised and discussed, to establish a basis for the
presentation of data in the remainder of the chapter. Following that, the influence of workers’ individual affective commitment is examined, the outcomes for knowledge sharing orientations and practice of trust levels between workers and their colleagues and workers and the organisation are identified, and the framework for action and understanding provided by the psychological contract are illustrated and justified. These are important because achievement of the organisation’s purpose is facilitated by the presence of a positive climate for task accomplishment and relations with other staff. Individuals’ relationships and the nature of their engagement with the organisation are associated with factors such as the extent of their affective organisational commitment, which forms the basis for their overall engagement with the organisation (Willem & Scarborough, 2006). Workers interpret situations and interactions within the work setting in accordance with the nature of their engagement (Meyer et al., 2002; Harris & Cameron, 2005). An appropriate match between an organisation’s performance and its industry conditions has been associated with its social climate (Collins & Clark, 2003; Fulmer et al., 2003).

Thirdly, the influence and importance of trust between workers and the organisation and among co-workers in shaping workers’ practices and behaviour are illustrated and discussed. Trust has been found to foster willingness to share personal knowledge (Levin, Whitener & Cross, 2006; Mooradian et al., 2006) and underpin positive interactions in the task environment.

Fourthly, the existence of a psychological contract and feelings of security which inform the worker’s relations with the organisation and execution of their job role are examined. This is because the psychological contract creates a framework for a worker’s understanding of their obligations to the organisation and their colleagues (Rousseau, 2004).
Finally, related concepts which contribute to the workers’ perceptions of appropriate behaviour and their treatment by the organisation are identified, including organisational citizenship behaviour, reciprocity norms and organisational justice (Tagliaventi & Mattarelli, 2006; Wasko & Faraj, 2005).

In preview, these concepts (i.e. affective organisational commitment, trust, the psychological contract, feelings of security, and norms concerning organisational citizenship behaviour, reciprocity and organisational justice), together explain the establishment of workers’ understandings about what the organisation requires and what it expects, and how contributions such as knowledge sharing are valued and recognised.

In Chapter Six, data illustrating workers’ situated knowledge generation and sharing practices are presented. Here, findings that illuminate these micro-level factors are introduced and justified. In the first section below, data illustrating the orientations and characteristics of individual workers are presented and discussed. This provides a context within which the presentation of data illuminating influences that operate at the individual worker level can be explored and interpreted.

Individual Workers’ Orientations and Characteristics

Workers in the groups investigated in this dissertation possess a number of characteristics that influence their participation in the workplace. As described in Chapter Four, their occupations are engineering and design drafting, requiring formal entry qualifications at degree and diploma or associate degree respectively. Further, their fields possess community-recognised bodies of formal knowledge and skills, their work includes use of a range of artifacts, and the fields of engineering and design drafting are recognised...
professions with occupational standards of practice (Skule, 1999). These workers, therefore, can be regarded as professionals and as knowledge workers (Alvesson, 2004; DiMaggio & Powell, 1991). In describing the workforce, Dennis (a manager), comments:

The general level of intelligence here is quite high, probably it’s fair to say it’s higher than the average ... These people here wake up a lot earlier than the ordinary person.

These comments illustrate the capacities of the area’s workers: a combination of intelligence and practical knowledge that results in informed task execution and problem solving. These workers’ age and skill profile is described by James (a manager with more than 20 years’ experience).

We’ve got an interesting age profile … in civil engineering we’ve got this profile that looks like … 55 year olds or 50 year olds … your younger up to 30’s and … your 30-40 year olds. We don’t have many medium knowledgeable people. We’ve got a lot of very knowledgeable people and a lot of developing people (James).

From the organisational knowledge perspective, these older workers form a rich resource. However, the organisation is vulnerable to knowledge leakage: these workers’ retirements are soon due over a common time frame. As discussed in previous chapters, development of extensive rail knowledge occurs over a lengthy period of workplace training and exposure to broad task experience. Consequently, this age profile has important implications for the organisation’s continuing ability to meet performance requirements, become the nationally dominant rail operation, and maintain its competitive edge. Therefore, in order to maintain the locally constructed and situated expertise in the collective, knowledge sharing with less knowledgeable and younger workers is of especial importance.

High levels of technology expertise could be reasonably expected in design fields such as engineering and design drafting, as technological artifacts are used in professional practice, and currency with latest developments would be expected. High computer literacy is not
always associated with older workforces. Yet, when commenting on use of technology, Duncan observes: “in our group there is a very high computer literacy.”

The professional field establishes the framework for action. However, as James notes: “We are our worst enemy being engineers, because we start to think the world can be all organised and systems can solve anything” (James, engineer). Indeed, engineering has been described as ‘the art of applying scientific principles to solve a problem’ (Frey, 1998) (e.g., focusing on application of rules, measurement and systems based thinking). This professional framework underpins James’ comments.

The solution-focused engineering approach reflects the civil engineer’s role as ‘the leading construction professional responsible for the design and supervision of civil engineering projects’ (Fu, Lo & Drew, 2006). Yet, as the required skills encompass technical, people management, communication and financial areas (Berger, 1996), these engineers’ knowledge domain extends beyond their original professional basis. In the context of increasing ambiguity, changing roles and work demands, James’ comments may be interpreted as suggesting the scientific approach may not provide solutions for all problems.

Job fulfilment and motivation

Contributing to affective organisational commitment is the individual worker’s sense of personal fulfilment and achievement which arises from their work, which in turn, reinforces their performance motivation. Sources of job fulfilment and individual motivation may arise from workers’ ontogenies (i.e. their personal histories, values, beliefs, preferences and emotions (Billett, 2003)). Additional sources might include aspects of the job design and tasks, for instance, status, role, degree of autonomy, discretion to innovate and to relate to
colleagues. Barry (an engineer) and Angus (a design drafter) identify aspects of their TransportServices employment which provide individual fulfilment:

Seeing something that you’ve taken from concept through to actual operation and in ten years down the track it’s still standing up. That’s beneficial and rewarding (Barry, engineer).

The fulfilling part of your job is when you see things are built, projects that you’ve worked on and all of a sudden and suddenly the result is there. I’ve worked on several projects now that I’ve seen the results and that’s what’s fulfilling … the railways has used it (Angus, design drafter).

So, both professionally-based fulfilment (e.g. “in ten years down the track it’s still standing up,” “things are built”) and job fulfilment (e.g. “you’ve taken from concept through to actual operation,” “I’ve seen the results”) can be seen to motivate these workers. Like Barry and Angus, most respondents identify the sense of ownership and personal achievement they receive from seeing their designs constructed and operational for the organisation and its clients. Implementation of their ideas results in tangible and visible outcomes. The contribution made by their input and work reinforces their feelings of personal worth and identification with the organisation, and hence, their commitment (Harris & Cameron, 2005).

For instance, as Angus further notes: “you’ve had something to do with it … the railways has used it, it’s fulfilling.”

As with other creative and construction fields, the TransportServices respondents report the satisfaction and reinforcement they receive from the outcomes of their work.

Malcolm and Barry describe their experiences:

Doing anything and then knowing yourself that it looks good, it does the right thing and also getting recognition. When you get a thank you email or something like that, that makes a big difference. That also comes with you got to know yourself that you did a good job (Malcolm)

But the best part for me is actually… you go and see it built and they don’t have to maintain it, they’re using it properly. There’s one facility near Baytown that is really, everything worked, it’s operating perfectly and they’re looking after the
place. There’s things like that. Even in the small jobs. Seeing something that you’ve taken from concept through to actual operation and in ten years down the track it’s still standing up. That’s beneficial and rewarding (Barry)

These respondents are engineers with more than 20 years’ service history with TransportServices. They describe their personal rewards from the output of their skills and knowledge. Typically, as ‘knowledge workers,’ they are, to a large extent, intrinsically motivated, but also receive reinforcement and fulfilment from achieving a successful outcome (Blackman & Davison, 2005). Proof of their contribution is available in the successful operation of the facility they have designed, whether large or small. Recognition, (‘a thank you email or something like that,’ Malcolm) is appreciated and has been associated with reducing knowledge worker intention to leave (Lee-Kelley et al., 2007).

Implicit in respondents’ sentiments is the concept of service. The service concept has been associated with the satisfaction described when an individual’s work is implemented by the organisation to provide services to the public and other clients, and has been closely associated with public sector motivation (Wittmer, 1991). For Angus, there are close links between the projects he works on and his personal interests. This convergence is described by Brewer, Selden and Facer (2000) as rational motivation, one of three public sector motivation constructs (the others being norm-based and affective motivation).

Elaborating his primary value and motivation, Todd notes:

You get given the opportunity to contribute something that benefits a lot of people. I think, I’m not a people person, but if I’m going to do something, I’d rather do something for the good of mankind or community rather than just doing it for myself. Interestingly, I think there are a lot of people like that … (Todd, engineer)

As an engineer and manager with extensive public sector experience, Todd demonstrates a strong service ethic, commenting: “There is some reward in … being able to
participate in long projects or plans with people who improve the city or the environment we live in” (Todd, engineer).

Todd demonstrates both norm based motives, previously identified (see Chapter Three) as a desire to carry out public service (Kim, 2005) and affective motives, based upon personal perceptions of the worthwhile, communitarian nature of the tasks being executed (Kim, 2005). Differentiating further, Nick observes:

Governments probably have that belief that they are not really deadlines they are more guidelines mentality and ‘we’ll get it right first time’. That is probably it. That is how I differentiate between private practice and Government agencies (Nick, engineer).

A mastery orientation - focused on excellence rather than meeting targets - resonates with Nick, and is a characteristic of expert workers (Chiaburu & Tekleab, 2005). As established in Chapter Six, discretion to innovate is valued by experienced workers and professionals (Alvesson, 2004). For instance, Nick elaborates:

I suppose it’s the ability to develop a few different ideas. Every now and then you might come up with something clever, maybe. If you can come up with something a little bit clever, little bit left field, out of the box that sort of a thing (Nick, engineer).

The generation of new knowledge reinforces this engineer’s motivation and sense of achievement in his professional tasks and contribution to the organisation. Similarly, Tom (also an engineer), specifically identifies this factor: “The thing I like is to find out new things, a way of solving a particular problem. I find it rewarding when there might be a topic that I don’t know that much about and do some research into it.” (Tom, engineer). The pursuit of excellence and autonomous learning are typical of a mastery orientation (Kraiger, Ford & Salas, 1993) and of professionals.

In an organisational setting, it can be more difficult for individual workers to generate novel insights, as reframing and new interpretations are more easily achieved through group
problem-solving (Fiske & Taylor, 1991). Tom’s personal satisfaction arises from new learning generated through successfully dealing with challenges and arriving at novel problem solutions. He continues: “I’m always learning something new. Even though you think it would be pretty simple and you’d learn all that you need to learn in about three months but there’s always something that’s new” (Tom, between 10-20 years’ experience).

As a senior and long-standing engineer, Tom has well-developed strategies in problem-solving, and individually accumulated knowledge on which he selectively draws. Problem solving provides opportunities to exercise creativity and develop innovative ideas. Such behaviour is typically associated with knowledge workers and professionals (Alvesson, 2004). Autonomy to acquire and use knowledge is associated with psychological growth (Thompson & Heron, 2006) and optimum performance (Baer & Frese, 2003). This is important for organisational sustainability: the outcome is the construction of contextualised knowledge and skills unique to this organisation. So, these micro-level mediators provide a framework for individual contributions to the organisation’s sustainability.

Roger (an engineer) and Derek (a design drafter) are managers with service in excess of 20 years, highly regarded by other respondents for their expertise and management skills. They describe the most fulfilling aspect of their work at TransportServices: “Bringing through young engineers, developing and passing on my knowledge” (Roger, engineer); “… seeing people gain extra skills and becoming sort of, I suppose, more mature if that’s a word I could use” (Derek, design drafter).

These managers claim their most satisfying work outcomes as arising from the development of their less experienced staff. The staff development function of managerial work is an essential component in building organisational capability, with both instrumental
and transformational outcomes. For instance, organisations with well trained staff are better able to meet existing customers’ requirements (Saks & Haccoun, 2007). Further, these organisations are more able to establish and maintain competitive edge in their market through better adaptiveness and absorptive capacity (Cohen & Levinthal, 1990). Mentoring of novices creates formal opportunities for mentor and protégé for knowledge sharing and social connections, with co-workers and colleagues from other areas of the organisation. Such opportunities can contribute to the development of affective commitment and social capital and increased relationship networks for mentor and protégé - associated with improved knowledge sharing access (Pierce, Kostova & Roth, 2003).

The attitudes, values and practices of management influence the attitudes, values and practices of their workers, as discussed previously. James reports his belief that his role as a manager is to represent TransportServices’ ‘values in action’ to his own organisational area:

How I behave if you like is the role model that gets applied. I ... believe that fairly well actually. So if I’m a helpful person others tend to be helpful. If I’m abusive then other people think it’s OK to be abusive. It really is what happens. You set the model. It percolates down through the organisation. If I’m a risk taker others tend to be more risk taking etc. If I’m more conservative then the rest of the organisation tends to be more conservative. So it’s how I interpret what the organisation wants if you like and advise that into our culture” (James, manager).

These observations are important: supervisors and co-workers have been established as the strongest influence on individual workers’ attitudes and practices (Lewin, 1943; Mathieu & Zajac, 1990). Managers’ actions and attitudes create the framework for action by their workers. So, perceptions of support for knowledge generation and sharing are interpreted by workers as approval and encouragement for individual level knowledge sharing actions (Bock et al., 2005). In this way, increased knowledge sharing orientations are established as workgroup social practices.
Finally, however, Todd identifies another key factor in the success and expertise of these workers:

They love the idea to be associated with this train thing … So there is a special bond on a number of people. I wouldn’t say every one, but certainly a lot of people who work here are very dedicated to the train cause as it is been always a professional issue over the years (Todd, engineer).

These comments describe some workers’ emotional engagement and identification with their work in the rail context arising from their passion for trains. Not only does Todd, who is a manager, identify their passion for trains, but he notes their larger dedication to the ‘train cause.’ Emotional engagement has been associated with higher levels of motivation, job involvement and work performance (Ashforth & Humphrey, 1995). Higher levels of motivation and high job performance have also been associated with convergence between workers’ interests and organisational goals (Hackman, 1977). Where individuals identify with and promote a larger ‘cause’ their emotional commitment to the object may be magnified. Thus, these TransportServices workers are dedicated to working in, promoting, and delivering quality work outcomes through their personal emotional attachment to their industry domain.

In sum, the respondents demonstrate certain orientations and attributes which make an important contribution to their organisation’s competitive edge. In addition to the prerequisite formal qualifications, they possess high levels of technology expertise, broad project management skills and a rigorous, scientific approach to problem-solving.

At an individual level, motivation arises from intellectual, professional, job-based, and emotional fulfilment derived from the tangible outcomes of the complex work and a degree of emotional engagement with their field. Opportunities to operate autonomously, to continuously learn, and to contribute to the development of more junior colleagues are valued. Further, the organisation and broader community benefit from the mastery orientation and
service ethic evident in workers’ comments. Together, these micro-level factors create the framework within which tasks and relations are enacted at the local work practices site. The advanced age profile indicates, however, that loss of important and valuable knowledge may occur without planned preventative action by the organisation.

In the following section, findings demonstrating the influence of workers’ affective organisational commitment are presented and discussed. This is important in the present investigation, as affective commitment provides the overarching framework through which workers’ organisational experiences are interpreted and types of engagement are established. Affective commitment, therefore, can be expected to colour workers’ decision-making regarding their knowledge sharing practices at the micro-level of locally-situated processes.

Knowledge Sharing and the Individual’s Affective Organisation Commitment

Individual workers make decisions regarding their involvement, task accomplishment and interactions with others, based upon their affective commitment to the organisation. Affective commitment is an emotion-based psychological commitment, derived from the worker’s perspective of their experiences in and with the organisation, their supervisor and their colleagues (Clugston et al., 2000), as established earlier in Chapter Three. Important influences shaping individual affective organisation commitment in this enquiry were found to include length of service, identification with TransportServices, job fulfilment and motivation, interpersonal relations and rewards. Data illustrating these influences will now be elaborated in turn.
Length of service

Many of the participants in this research are characterised by lengthy service histories with TransportServices (See Appendices: List of Participants). For instance, the average length of service (excluding trainees) exceeds 18 years. So, generalised identification and satisfaction with TransportServices could reasonably be expected in many participants. A manager notes:

… I don’t get much leaving of people though. Whether at the end of the day they weigh up their life, work-life balance here, they way they’re treated here, and do give some value… that’s all I can surmise (Dennis, design drafter)

It seems that workers’ assessment of the overall quality of their organisational experiences, for example, relations with their co-workers, supervisors, workgroup norms and beliefs and organisational processes, result in their individualised attachment to the organisation, as claimed by Dennis. Over sustained service histories, extensive investments of time, ideas, skills and energies (physical, psychological and intellectual) occur, resulting in the development of affective commitment (Pierce, Kostova & Dirks, 2001). Longevity of service contributes to the development of affective commitment and team formation, in particular, in teams comprised of specialists where trust and mutual understanding are required (Pyöriä, 2007).

Longevity may promote a stable work environment and development of relations where knowledge seeking and knowledge sharing behaviours can occur without negative implications (Hargadon & Bechky, 2007). In addition, longevity may foster a sense of identification with the organisation, its mission and goals (Harris and Cameron, 2005), a climate of psychological safety and feelings of security (Rousseau, 2004). In the following section, evidence demonstrating workers’ identification with TransportServices are presented and discussed.
**Sense of identification with the organisation**

Generalised identification with the organisation is often based on “internalisation of organisational attributes, goals and achievements by the employee” (Harris & Cameron, 2005). Evident here is this process of internalisation which transcends work group loyalties and extends to concern for the well-being of other organisational areas and co-workers (Cameron, 2004). Respondents expressed identification with their organisation in different ways, for instance:

It’s a great place to work with a great bunch of people. We are all pushed in the same way, which is great. The conditions are really good. The people are nice…. Whilst I can see the improvement that is necessary and we are certainly not worked like slaves, it’s a good environment and I think it would be a good example of how you would really want an organisation to work (Cameron, design drafter).

Cameron’s comments indicate emotional engagement with TransportServices at several levels: (a) at the organisational level (e.g. “it’s a great place to work” “a good example of how you would really want an organisation to work”), (b) satisfaction with his working environment (e.g. “the conditions are really good,” “a good environment”) and (c) his colleagues (e.g. “a great bunch of people,” “the people are nice”). In a similar way, Joe, a design drafter, describes TransportServices:

We are at the forefront in rail in Australia. We carry out consulting projects in Asia and other places. Because other Australian state rail authorities have outsourced their engineering and design, the knowledge in this area is unique and closely held. … We’re proud that our CEO at the time when the other states’ rail authorities decided to outsource, had the vision to keep an in-house design and engineering facility. So now TransportServices is going from strength to strength and the other rail authorities are struggling (Joe, design drafter).

In these comments, Joe’s identification with the organisation (e.g. the repeated use of “we,” “our”) and its goals (“we’re proud,” “our CEO…had the vision”) is apparent. His comments demonstrate pride and respect in relation to the organisation as a whole, and the
work of the engineering and design drafting sections. They also demonstrate a strong sense of purpose and ownership, characteristics that are associated with commitment to an organisation’s goals and high standards of work performance (Bommer, Miles & Grover, 2003; Morgan, 1997).

Identification with the organisation and its goals, and actions to support goal achievement demonstrate affective commitment (Harris & Cameron, 2005). A long-serving design drafter embraces increased discretionary decision-making capacity:

There’s been a fair degree of change of responsibilities and I would say in probably the last ten years probably even more so. It’s been quite significant. There’s a fair degree of autonomy … Basically you’re making decisions on a daily basis. Which is wonderful. (Cameron, design drafter).

For an experienced, long-serving manager who is now distant from technical design tasks, the level of focus is more strategic and global. He describes the most rewarding aspect of his role:

… providing a stable organisation that will do well for the future. Ensuring that we’ve got the capability to actually provide what the organisation needs. Keeping it safe now, safe and profitable now and providing that for the future. I find that more fulfilling than actually seeing a railway line built (James, engineer).

James demonstrates strong identification with the organisation (e.g. “we’ve got the capability”), emotional attachment which manifests as concern for its well-being and continuation (e.g. “keeping it safe now…providing that for the future”) (Clugston et al., 2000), and the service perspective. Comparing the actions of TransportServices’ employees and external contractors, Robert (an engineer) highlights the difference in motivation and thinking:

TransportServices employee’s efforts work towards the best interests of the organisation, whereas if you bring in a contractor to consult, their obligation is to maximise return for their company. I’ve seen project managers come in and their sole objective is to get their project done and the consequences to anyone else is irrelevant. Whereas if it’s being managed internally you recognise that we all
work for the one organisation and if there are consequences elsewhere (in another part of the organisation) you’ll try and mitigate those in some way as well (Robert, engineer).

Identification with the organisation provides a framework for decision-making in which individual workers promote and act in the best interests of the organisation as a whole. Robert’s comments illustrate a desire to promote the overall functioning and well-being of the organisation, which has been associated with organisational citizenship behaviour (Lamertz, 2005). This kind of identification appears to be in contrast to the profit focus of the external, private sector contractors. In the public sector, identification with the organisation has been linked to public service motivation (Crewson, 1997; Naff & Crum, 1999). This motivation may arise because there is congruence between (a) the workers’ personal interest in service to the community and (b) the provision of transportation infrastructure and public transport by TransportServices - an important service to the community-at-large. So, identification with the public sector organisation’s mission, goals and values may reflect a high level of internalised personal or moral commitment by an individual worker (Shamir et al., 1993).

In sum, feelings of personal, individual identification with the organisation have been illustrated to function at the macro, organisational level and extend to actions taken for the support and maintenance of other organisational groups and colleagues who may be personally unknown to the individual worker (Cameron, 2004). High levels of micro-level, individual identification and shared values contribute to organisations’ sustainability, as they have been shown to facilitate trust and knowledge sharing among organisational members at the local, work practice level (Bock, et al., 2005).

Contributing to workers’ commitment and sense of identification with the organisation are the reinforcement provided by individual workers’ perceptions of their job outcomes and is of shared values. Hence, actions which may further the overall organisation’s interests
Data illustrating the influence of workgroup interpersonal relations and practices upon knowledge sharing are presented and discussed.

**Workgroup interpersonal relations and knowledge sharing**

Team-based work has been associated with successful project work of the type carried out in the design area at TransportServices. It has also been associated with knowledge work (Fisher & Fisher, 1998; Mohrman et al., 1995) which is leveraged through synergistic collaboration within the group. Constructive interpersonal and task relationships at TransportServices are described by Cameron, as evolving over time when workers are closely linked by group membership (Cohen & Prusak, 2000):

> You have this core of people that individually are OK, but you put them together and they work very very well. They’ve got the knowledge and they, what’s the word, they yes, supplement each other, I mean, they benefit each other” (Cameron, design drafter).

The social connections fostered through team and project collaborations develop trust, which may facilitate knowledge sharing (Pyörä, 2007). This is because willingness to share with and learn from co-workers is discretionary, and takes place within the social relations which exist in the group and between the co-workers. So, the existence of such willingness may encourage a practice of knowledge sharing. The willingness within this workgroup is described by Tom and Malcolm, below. Firstly, Tom describes the way in which his social networks underpin his knowledge sharing practices and his own problem-solving:

> When I used to work in the X section, I used to have a lot of contact with the people there and also with their designs. I get the interaction from them coming to see me and say, I don’t know how to do this or what’s the best way to do this. So I have them coming to see me. I still have my contacts that I see socially within the
X Section and I go backwards and forwards to see them from a social thing which may turn into, well what’s going on around the place … How is it shared? Only by the social interaction. (Tom, engineer).

Tom explains that reciprocal knowledge sharing is enabled through maintaining social contact with previous colleagues. His former colleagues seek his expertise and in turn, he gains information and advice. Thus, relational capital develops overtime and through repeated interactions (Leana & Rousseau, 2000) at the micro-level. It creates a basis of understanding for reciprocal contributions (Thompson & Heron, 2006) which occur at the micro-level, building social capital among those engaged in the work practices of the local knowledge collective. Benefits accrue at both group and individual level, facilitating interpersonal interactions and enhancing the environment for future knowledge seeking and sharing. For example, Barry describes his co-workers: “…very approachable for starters, they are also very knowledgeable.” The knowledge sharing implications are clear: cordial relations with his colleagues and their willingness to accept his overtures will facilitate Barry’s access to his co-workers’ personal knowledge repertoires.

In summary, this section has presented data illustrating important micro-level influences that contribute to individual workers’ affective organisational commitment. These are: (a) length of service, (b) personal identification with the organisation’s mission and values, issues central to individual job fulfilment and motivation, and (c) the connection between interpersonal relations and knowledge sharing, which were found to influence affective commitment and knowledge sharing orientation. These factors have been shown to act at the micro-level, providing the genesis for workers’ beliefs about the nature of their relationship with the organisation. They shape workers’ beliefs about work practices and appropriate knowledge sharing among co-workers. Building on this evidence, the next section
discusses data illustrating the influence of trust among workers on knowledge generation and sharing at the micro, situated level.

Knowledge Sharing and Trust

Interpersonal trust among workers in organisations facilitates the development of social capital (Spagnolo, 1999), knowledge generation (Cook & Wills, 1999), and improved organisational results (Waddock & Graves, 1997). This kind of trust, together with the process it engenders and supports, stand as salient micro-level processes which shape knowledge sharing.

Trust has been associated with individual workers’ decisions, firstly, to share valuable personal knowledge and practice repertoires, and secondly, to provide guidance to other workers who may later displace them (Dirks & Ferrin, 2001). So, individuals’ knowledge sharing practices are shaped by the history of their micro-level relations and interactions with colleagues. Malcolm illustrates this reciprocal process:

“… if you like someone, like their methodology, their work ethics and that sort of thing, you are more willing to give more information than what you would do for somebody else” (Malcolm, design drafter).

These comments illustrate the strong interpersonal ties to co-workers that arise through shared norms and values, and foster both affective organisational commitment (Cameron, 2004) and trust. The relational history of interactions influences Malcolm’s knowledge sharing practices, facilitating knowledge sharing where he respects the knowledge seeking colleague’s work practices and values. Thus, his knowledge sharing practices are influenced at the micro-level, by his assessment of his colleague’s work practice norms, values and
trustworthiness. Expanding this theme, Joe makes the following observations regarding his co-workers’ knowledge sharing behaviour:

Some people do. Some don’t, due to past history of their relationships with other people and perhaps how they feel about their career or their colleagues. There are some wanting to hold onto what they know. It has improved (Joe, design drafter).

Joe’s observations demonstrate the impact of relational history, which occurs in the individual, group and organisational context. Where past micro-level interactions have not been positive or rewarding with co-workers, relations with those co-workers may not support future knowledge sharing. Further, Joe suggests that organisational, macro-level factors, (e.g. where an individual worker believes that their efforts are not recognised or appreciated), may lead a worker to withhold their personal knowledge. Withholding knowledge has been associated with: (a) lower levels of individual organisational commitment (Leana & Van Buren, 1999) and (b) political behaviour designed to create leverage for the achievement of personal objectives (Adler & Kwon, 2002) such as protection or improvement of an individual’s position within the organisation (Pettigrew, 1973).

Experiences of work practices that develop an environment of trust facilitate work relations. For example, Angus (design drafter) describes problem solving: “it would be open discussion” and Ian (a trainee) notes “they’re professionals.” Therefore, seeking assistance becomes a low-stakes activity when there are supportive and cordial knowledge sharing practices, facilitated by group problem-solving, within an environment of micro-level trust:

If you run out of ideas you go and use someone else as a sounding board to try and see if they’ve got any other ideas because they might have. They will have a different perspective because you’ve been looking at it a bit too long – try and ask other people for a few more ideas (Joe, design drafter).

Continuing, Malcolm describes a group problem solving process:

I wanted to try and give them their own identity … but in the end I think they decided that they will do it the same way … they adopted it, it’s their decision to
do it. We listened to all the problems, even if one way didn’t work or something like that we still listened to it and looked at all the avenues (Malcolm, design drafter)

In contrast, however, information withholding may diminish co-worker trust. This is because withholding information can be seen as unethical: designed to create advantage for the knowledge holder and disadvantage for the knowledge seeker (Cook & Wall, 1980; Ferres, Connell & Travaglione, 2004). Joe, (a design drafter with more than 20 years’ experience), highlights the outcomes when co-workers claim information is being withheld:

If you don’t share everything you know when you know about some things that your colleagues don’t know, some colleagues take this personally. In their view it can seem like you get promoted when you don’t know a lot. I might just give them what they need but no extra (Joe, design drafter).

Joe identifies that his knowledge sharing decisions can be based on his view of the information that his colleagues actually require to execute their tasks. His knowledge sharing behaviour appears instrumental, rather than based on peer support. However, reciprocal interactions are diminished by co-workers’ perceptions of self interest (Tichman, 2003) and knowledge sharing exchanges which are held to be of inadequate quality or reliability. So, Joe’s actions may result in increased micro-level incidences of competitive and self-protective behaviours among his colleagues, reducing future knowledge sharing (Dirks, 1999).

Demonstrated loyalty to TransportServices’ interests rather than self-interest is important for Tom (an engineer):

Call me old fashioned, but loyalty means a lot to me, and I don’t think highly of somebody who is just in the organisation to make as much money as they can for them and then leave the place, and it’s a bit of a worry too in passing all the information (Tom, engineer)

While initial attributions of trust occur early in workers’ relations in order to facilitate task achievement, further interactions over time result in decisions about experienced trustworthiness among workers (Williams, 2001). The actions and attributions of Joe and Tom
reflect their individual values, workplace behaviour and knowledge sharing orientations. Indeed, referring to the experienced realities of business arrangements with external contractors, Tom identifies a clash of values:

The other thing that hurts too I guess is when these people that you train and then when they’ve got a problem they come and ask me, because you’ve been here a long time you’ve got the expertise, what’s the answer to this problem that I’ve got, well you should be doing this, OK cool. Thanks. But still send in their bill at the end of the fortnight and still get paid 50%, 100% more than what I’m getting paid. So that’s what hurts a little bit. That they’re picking your brains and using your expertise (Tom, engineer).

Integrity has been identified by Butler (1991) as an underlying assessment of trustworthiness. Further, attributions of integrity are derived by colleagues from beliefs about their co-workers honesty, fairness and the absence of hypocrisy (Cunningham & McGregor, 2000). Thus, in situations where professionals such as Tom claim that their expertise is being appropriated by others to further individual agendas rather than further TransportServices’s welfare, attributions of untrustworthiness are likely. Relations can become characterised by low trust and suspicion. So, knowledge sharing is likely to be diminished by these micro-level attributions.

In summary, co-worker trust has been identified as an important contributor to willingness to share information (Cohen & Prusak, 2000). Development and maintenance of trust is influenced by micro-level mediating attributes such as competency, promise fulfilment, loyalty and openness (Butler, 1991), benevolence, integrity, predictability and the relational history of experienced interactions and behaviour (Cunningham & McGregor, 2000). In this way, knowledge sharing orientation is shaped and enacted through the history of individual, personal interactions with colleagues within the micro-level work and social practice setting. Inevitably, those interactions may include certain contestations as individual perceptions, beliefs and values are enacted. These contestations influence future knowledge
sharing preferences and behaviour among individuals. In the following section, the influence of workers’ perceptions of the psychological climate and interpersonal relations on knowledge generation and sharing are presented and discussed.

Knowledge Sharing and Feelings of Security

High levels of worker satisfaction with their job security have been found to positively influence worker performance (Yousef, 1998). Job insecurity has been negatively linked to organisational commitment and performance (Rosenblatt & Ruvio, 1996) and job satisfaction. Previously, it has been established that positive perceptions about the support received, fulfilment of promises and experienced psychological climate contribute to the worker’s connections with the organisation at the macro-level, and their workgroup at the micro-level. In turn, these connections contribute to their sense of belonging and understanding of their relations with the organisation and their colleagues. So, orientations for discretionary job behaviours such as knowledge generation and sharing are influenced by feelings of job security and perceptions of the organisational environment at the macro and situated levels.

Managers play a key role in developing a favourable environment for their workers to execute their tasks to the organisation’s requirements. One aspect, the role of management as advocate for their workers, is elaborated by James:

Whatever way you like to think about it you can think about it from abuse in the workplace, you are there to protect the people. Right? If it’s from some bad manager somewhere criticising their work performance unjustly, you’re there to stand up for them and say wait a minute that’s not fair (James, a manager).

However, some managers in TransportServices have achieved promotion on the basis of their technical expertise and project outcomes. These attributes are not always held by their staff as being accompanied by appropriate people management skills. Duncan observes:
The managers in this organisation have traditionally been engineers because it’s an engineering firm and … because they’ve probably been good engineers then they’ve been put in a management role. They’re not necessarily good managers, good people managers. A lot of them haven’t got good people skills (Duncan, engineer).

As previously established, TransportServices uses formal organising structures, hence managers have formal positional power in addition to expert (professionally and technically-based) power (Fiol, O’Connor & Aguinis, 2001).

And then it goes further up the chain, because the supervisor takes the responsibility of it, but then our project, our section manager oversees that too. So it is not just keeping the supervisor happy it is further up the management chain that you’ve got to keep happy too (Malcolm, design drafter).

Negotiation, agreement and alignment of effort are required for task accomplishment in large organisations composed of numerous sub-groups, such as TransportServices. As Malcolm describes above, contributions and group progress may be examined and possibly re-negotiated at more senior levels where outcomes are monitored and reviewed. Similarly, Todd reports the shaping and perspective formation process which occurs:

You do some thing which is not right and it goes to your supervisor … or it might be picked up 2 or 3 layers above you … this is not right. So he comes back with a much stronger message … don’t make me look bad next time please. So people learn one way or another either by inference or by direct information that this is acceptable, that’s not acceptable (Todd, engineer).

In this way, systemic power employs the authority provided by the formal structure to achieve strategic objectives (Pfeffer, 1981). Socialisation processes shape norms of beliefs and behaviour, informing workers of appropriate and desired practices and undesirable practices, such that the organisation’s objectives can be achieved (Scott, 2001). For instance, understanding of roles, discretionary behaviour and decision-making autonomy may be negotiated and re-negotiated in relation to tasks and performance evaluations. This is important for knowledge generation and sharing practices. Knowledge access and transfer can
be adversely affected by rigid application of formal organising structures, boundaries and control processes which discourage exploration of new ways or alternative approaches.

A psychologically safe environment, characterised by open and trustworthy interactions, encourages presentation of new ideas without sanction (Edmondson, 1999). Problem-solving situations can be associated with challenging and contested workplace relations. At TransportServices, Angus (design drafter) believes that interpersonal interactions in problem-solving contexts focus on the task requirements: “… it would be open discussion. We sit down and actually talk about it. It would be the best solution or the best idea that be suited for the project or suited for a section.” In comparison, Malcolm, (design drafter) suggests: “I tend to think that unless the supervisor is totally convinced it will be the way the supervisor wants to do it. It is because of that responsibility.” In Malcolm’s view, the responsibility associated with positional authority will result in the supervisor exercising their formal power to make the final decision. So, the organisation’s structural arrangements mediate knowledge generation and sharing in this instance.

Problem solving situations occur within the micro-level context of the organising arrangements which frame the locally situated work practices. So, hierarchical and formal positional power influence the way decisions are made in the course of work. Practices within separately supervised work groups will reflect groups’ work histories, practice norms, group relations and supervisor preferences, resulting in varying approaches to arriving at the final decision. Similarly, these factors can be expected to shape interpersonal interactions, the creation of effective team functioning and the integration of newcomers, for instance, trainees.

The traineeship approach shapes newcomers’ behaviour through formally creating a knowledge sharing mechanism. Traineeships, coaching and mentoring have been associated
with work and social connectedness (Merriam & Caffarella, 1999). They provide necessary expertise development, introductions to important and helpful others, information about work and cultural practices, and initial access to the social capital existing in the relationships and connections of the workgroup (Mouw, 2006). However, for novices entering the established work group, interpersonal relations can be challenging. Ed describes the most demanding aspect of his work:

> Communication with other colleagues …. It also depends on people’s personality. We humans have our human factors, our moods sometimes, the ability to understand from the body language, you can see whether this guy is in a joking mood or not (Ed, trainee).

Ed notes “a certain amount of people skills is the main thing” in establishing and maintaining relations with the established workers. He identifies the emotional labour involved in joining an established group. For instance, Ed, a trainee describes his experience:

> “It makes me feel good when they throw a joke at me and I feel that I’m accepted, that I am part of the team and I feel good that they invite me to drinks for example” (Ed, trainee).

Becoming an ‘insider’ (Stamper & Masterson, 2002) is a central issue for trainees. ‘Insiders’ are more likely to gain more frequent contact with knowledgeable others, increasing the likelihood of beneficial knowledge sharing encounters (Borgatti & Cross, 2003). For instance, Gerald, who is a trainee, describes the experience of another trainee:

> Just one of the newer blokes that came in … He was sort of a bit hot-headed about things and sort of thought he knew everything ... No one was rude about it, but you definitely sort of sense it but I think he sort of learned, experience comes with the job and that you can’t walk in there and know everything (Gerald, trainee)

Trainees, as both newcomers and novices, must demonstrate attitudes and behaviour that will facilitate working relationships with more experienced colleagues, positive progress assessments, and further access to work and progression opportunities. In such psychologically safe micro-level environments, social capital fosters shared goals and socially
connecting behaviour such as knowledge sharing (Willem & Scarborough, 2006).

Development of further social capital will likely be based upon shared experience, exchange of information and respect as trainees develop their own social connections (Willem & Scarborough, 2006).

Certain contestations in workplace relations have been observed by Gerald (the most recent and junior member of the collective): “Definitely need a sense of humour. You need to be able to get along good with your work mates otherwise there is a lot of bitchiness, I suppose you call it, that goes on” (Gerald, trainee).

Patterns of interaction and socio-cultural practices may be more visible to newcomers as they attempt to integrate with the established group and become ‘insiders’ (Stamper & Masterson, 2002). Gerald has concluded that certain social skills and attributes will assist his integration and negotiation of future work relations with colleagues, a valuable learning outcome. Overall, however, trainees report positive experiences of knowledge sharing from their more experienced co-workers: “Everyone’s pretty good at sharing their knowledge. It certainly makes the work more easier and the place is run more efficiently when everyone shares the stuff” (Gerald, trainee).

A shared sense of purposeful identity has a positive impact on behaviour (Alvesson, 1993). Hence, consonance among the organisational, professional and personal values shapes individual knowledge sharing orientation, to create a constructive and supportive psychological traineeship environment. This is important for development of the newcomers’ affective commitment and feelings of obligation to help the organisation achieve its goals (Meyer & Allen, 1997). Concurrently, increased learning and more frequent opportunities for knowledge generation and sharing are created, important for enhancing capabilities. In this
way, trainees’ knowledge, sense of belonging and feelings of security are fostered by positive micro-level experiences and influences. Not all respondents demonstrated a strong sense of job security, however, and this will now be illustrated.

Sources of insecurity

The main source of insecurity identified in this dissertation relates to the organisation’s slowness in filling vacancies accompanied by increasing use of external consultants (described in Chapter Five). Strong levels of concern were expressed about positions remaining unfilled for lengthy periods while work demands continued to increase. For instance, Malcolm comments on the impact of unfilled positions on workload and morale:

It just seems that the organisation doesn’t seem to be filling those vacancies and sort of having a snowball effect with morale and that sort of thing with the other people who are still left there. Something that Network Access or our group needs to be aware of or needs to take into account soon otherwise it is going to deteriorate more (Malcolm, design drafter).

High levels of morale can result in affective commitment, and psychological benefits for employees such as strong ties to co-workers and the organisation (Cameron, 2005; Meyer et al., 2002). Malcolm expresses concern that the impact of the long-standing vacancies appears to be unacknowledged by management. He is concerned that morale has already lowered and “it is going to deteriorate more” without acknowledgement and remedial action. Low morale can, therefore, be expected to impact negatively on micro-level mediators, resulting in lowered affective commitment, the deterioration of social connections and reduced capacity building behaviours such as innovation and voluntary knowledge sharing.

Further, many respondents expressed feelings of insecurity arising from the increased use of consultants. Typical beliefs are described below by Barry, Derek and Duncan, each with more than 20 years’ employment in TransportServices:
Our feeling is that the higher ups don’t want a Design area, we’ll be whittled down in a short period of time, probably more particularly on the Construction side, to being outsourcing stuff (Barry, engineer).

With consultants we are concerned that we are giving them a competitive edge by virtually training them into railway design if you like … giving them the competitive edge might mean the loss of our jobs. So there is some worry there from people … They really are our competitors but we use them because we haven’t got the resources, you know … and it’s a real issue at times (Derek, design drafter)

It is a bit worrying – where it’s going to lead to long-term. It sort of comes in fits and starts. So you think you’re fairly safe for a while and then it starts. Fortunately they really can’t outsource us to any large degree because there is nobody else readily available who can do it. You can’t just go to an outside consultant and get them to do the work we do, they just haven’t got the knowledge to do it. But there are other companies in (the country) who would probably take on the work if they had the chance (Duncan, engineer).

Fundamental to the concerns expressed by these workers is the lack of information and discussion they have experienced regarding the reduction in staffing and increased use of outside contractors. Hence, they express feelings rather than clear information (e.g. “our feeling is …,” Barry, engineer), about being not wanted (e.g. “higher ups don’t want a design area,” Barry) or secure (e.g. “you think you’re fairly safe for a while then it starts,” Duncan) and in danger (e.g. “the loss of our jobs,” Derek). In this way, the beliefs workers develop about the extent to which the organisation values their contributions and cares about their well-being contribute to their micro-level affective commitment, levels of satisfaction, discretionary job behaviours, and organisational citizenship behaviour (Aselage & Eisenberger, 2003). This is important: knowledge generation and sharing are discretionary behaviours, influenced by workers’ perceptions of the organisation’s commitment to them as individuals demonstrated over time and individual work histories (Wayne, Shore & Liden, 1997).
Increased workload impacts on time available for coaching and monitoring trainees, and is described below by Cameron (design drafter). In his opinion, the impact is negative:

What you are finding with this reduction in the experienced side of things, you are going to find that there is a lot more pressure is put on the experienced people to get the trainees up to speed, well up to semblance of speed, and you cannot (Cameron, design drafter)

So, reduced TransportServices staffing caused by failure to recruit and increased outsourcing is causing increased workload for experienced, knowledgeable individuals, thereby reducing their ability to share the accumulated personal knowledge and expertise with the trainees for whose development they are responsible.

In this section, influences on workers’ perceptions of their job security have been discussed. This is important because individual workers’ knowledge generation and sharing orientation are influenced by micro-level perceptions, arising from their understood and experienced psychological climate and beliefs about organisational support they have received. These perceptions are developed over time, mediated by the individual employee’s work history and their relational and interpersonal history with colleagues. They constitute bases for the formation of micro-level attitudes and behaviour regarding intention to assist the organisation in achievement of its strategic objectives. In the following section, data are presented that illustrate influences on knowledge generation and sharing behaviour, resulting from the worker’s assessment of their relationship with the organisation and their experienced reciprocity.

Knowledge Sharing, Reciprocity and Organisational Citizenship Behaviour

A shared sense of purposeful identity has a positive impact on behaviour (Alvesson, 1993). The development of relational capital occurs over time and through a history of
interactions at the micro-level among individuals and groups (Leana & Rousseau, 2000). At the micro-level, understandings informed by judgements regarding trustworthiness and the outcomes of previous interactions provide the basis for future reciprocal contributions (Thompson & Heron, 2006) and organisational citizenship behaviour (OCB). For instance, Duncan (an engineer with more than 20 years’ experience) comments:

Our group is all fairly good friends … I guess you get the different personalities and if people have done the right thing by you, you will do the right thing by them. So if you don’t get on particularly well with somebody you will perhaps not tell them everything. But that is probably the way that you have been treated yourself (Duncan, engineer).

The relational history among the engineers and design drafters in this organisation is the critical factor in collaboration and hence, knowledge sharing. Individual workers’ decision-making in regard to knowledge sharing is based upon workers’ perceptions of their reciprocal relations with co-workers. Firstly, beliefs about the general relations among colleagues are considered. Secondly, the value of reciprocal interactions, over time, between individuals, is then assessed. Consequently, specific decision making occurs regarding the nature and extent of knowledge sharing exchanges with certain colleagues. Duncan, for instance, is identified as a valuable source of knowledge and guidance by Robert, who is a younger and less-experienced engineer: “Duncan (possesses) an extraordinary knowledge …very personable and prepared to help and prepared to share information, or guide you to find it yourself.” (Robert, engineer)

Willingness to assist others and to freely share their personal expertise is not always associated with very expert knowledge workers (Lee-Kelley et al., 2007) but has been linked to the existence of social capital in the group (Willem & Scarborough, 2006), as illustrated in Chapter Six. Duncan’s generalised willingness to share his knowledge (as highlighted by Robert) such that the help-seeker is enabled to access and acquire knowledge, is a
characteristic of OCB (Organ, 1988). This behaviour goes beyond problem-solving assistance, to actively building the knowledge capital within the group, a process identified by Lave and Wenger (1991) as essential to knowledge communities. The value of generalised helping is described below by William, who attributes it to identification with the organisation: “Knowing that we work for TransportServices, the more you share the information the more efficient the work will be and less cost for TransportServices for other people to do the work” (William, engineer).

The links between identification with the organisation, the existence of affective commitment and knowledge sharing actions has earlier been illustrated and discussed. Individual understanding of the psychological contract provides the micro-level context for OCB actions which support and enhance organisational effectiveness, as illustrated by William’s comments. In addition, William reveals that a more instrumental and pragmatic basis can underpin reciprocal interactions with engineering colleagues:

Depending on who you talk to. Some people are reluctant to release that, ‘oh well if it’s helping’ – it is normal I guess and depending on who you talk to and if you are helpful to them you usually get information. My character is that I tend to help people thinking that I might need their help in the future (William, engineer).

As proposed by Sanders and Schyns (2006), cooperative behaviour functions in relation to the target of the cooperation, resulting in more cooperation with some colleagues than others. Where certain co-workers may also possess positional or other types of power, cooperation may be undertaken to create a helping context for future interactions (Van Emmerik & Sanders, 2004), as illustrated in William’s comments above. Within the design drafters’ group, a reciprocal process influenced by relations between co-workers is described “Depending on the person, I think it is, some people need to get that information – it is a two-way flow. Other people tend to reciprocate” (Malcolm, design drafter).
The process is seen to be reciprocal and straightforward among the group, but indicates instrumental purposes as well. Malcolm’s comments reflect the likelihood that knowledge seeking behaviour may also act to confirm and reinforce the knowledge sharing relationship. In contrast, Cameron (who is a long serving design drafter) ascribes the basis of collaborative behaviour within the group to the strength of team-based relationships:

What I really like about it in here is the fact that we are a team environment and I think if you keep that in mind the fact that it is a team of people then you’ve got it made. And you look after those people. I’m not talking token gestures or things like that, but if you doing something and you’re not looking for a thanks (Cameron, design drafter).

So, the development of social capital and correspondingly favourable conditions for knowledge sharing, are fostered by the stability and high levels of mutual engagement present at the micro-level within the team (Nahapiet & Ghoshal, 1998). This is because gaining information from another requires their collaboration, which usually arises from the relationship between the two parties (Cross & Sproull, 2004).

However, efforts by workers with specific expertise to share what they believe is valuable knowledge may be rebuffed. Roger, who is a long serving engineer and manager, explains: “Providing information doesn’t work unless the individual has the need and motivation to use it” (Roger, engineer). For instance, Angus, (an experienced design drafter), describes his frustration in dealing with a colleague who does not act upon his attempts to share his expertise:

… not really putting enough effort, not really thinking about what needs to be done, not doing and not listening and this person has been here for several years now and they are still bouncing the same ball. I would say that I would restrain myself from actually going further with this people … because you tell them, you might tell them ten times and they are not listening and basically when you see what they’ve done its their way any way. It’s just a waste of effort to tell them (Angus, design drafter).
This history of interactions is frustrating for Angus who believes that his knowledge sharing is not appreciated by a certain colleague. Future knowledge-based interactions are, therefore, unlikely to be initiated by Angus with this co-worker. OCB is sensitive to context, relations and events (Ilies, Judge & Scott, 2006; Mischel & Shoda, 1995). However, OCB is usually characterised by a positive attitude which does not take offence or react on a personal level when encountering such rejections (Podsakoff et al., 2000). In this example, fluctuations in OCB arising from micro-level relations are evident (Weiss & Cropanzano, 2006). The target of the knowledge sharing may be simultaneously assessing the value of previous exchanges, the value of the proffered knowledge, and exercising their individual agency in rejecting it on this occasion (Raudsepp, 2005).

The contrasting remarks of Tom demonstrate important features of OCB: his organisational loyalty, helping orientation, expectations of others, and approach to knowledge sharing.

The work ethic, just to make sure that they’ve done the best possible job that they can do when they’re doing their report and doing their estimate and done it because they can, don’t make mistakes, or make mistakes but be diligent in what they’re doing when they’re doing. Always doing the best that they can. If they come and ask you questions, I’m happy to answer any questions if somebody is doing something and help them as much as they can, and I like to see the people still be self sufficient and self motivated to do it and be enthusiastic about, just in their body language or just their attitude they’re happy to be here and working and all these things that you recognise in the way they behave. Their values, certainly like to see them doing their best for TransportServices and TransportServices’s interests. Whatever’s best for TransportServices’s interests rather than taking the easy way out I suppose (Tom, engineer).

These remarks offer both an illustration and a summary of the influence of OCB and reciprocal relations upon knowledge sharing orientation and behaviour among these workers. Reciprocal collaboration has been demonstrated to arise from micro-level mediators including the workers’ positive assessments of their co-workers’ commitment, conscientiousness, work
ethics, and trustworthiness established over time and ongoing interactions. This interactional history has been seen to contribute to micro-level relational capital through: (a) individual values and behaviour such as willingness to act without reward, (b) assisting co-workers voluntarily and upon request, and (c) engaging in behaviour which helps co-workers and the organisation to perform effectively. Such behaviours are fundamental to knowledge generation and sharing, which are, by nature, dependent upon the positive commitment and willingness to initiate action in the best interests of the organisation, which is typified by OCB. In sum, therefore, OCB and reciprocal interactions constitute important micro-level mediators for knowledge generation and sharing among these workers.

So, perceptions of being treated fairly by the organisation’s representatives and in organisational events, further shape the socially situated practices of workers on a day to day basis in organisations. In the contested nature of organisational settings, these perceptions and orientations further create the context for relational interactions, loyalty to the organisation and actions to further its capabilities. In the following section, data illustrating the influence of perceptions of organisational justice on knowledge sharing are presented and discussed.

Knowledge Sharing and Organisational Justice

Organisational justice describes the worker’s beliefs about the fairness of the exchange relationship the worker has with their organisation, in terms of rewards and procedures (Hendrix et al., 1998). Perceptions of organisational justice have been identified as a key predictor of organisational commitment, trust (McFarlin & Sweeny, 1992), perceptions of organisational support, helping behaviours, and likelihood of engaging in knowledge
generation and sharing behaviour. As such, they are micro-level contributors shaping knowledge generation and sharing practices.

Climate mediators (i.e. support for initiative and an environment of psychological safety for innovation) have been found to exert a positive impact on the implementation of innovations, because process innovations depend upon personal responsibility, flexibility, and the execution of individual tasks in a sequential or team context (Baer & Frese, 2003). For instance, Malcolm describes the operation of discretionary decision-making and autonomy in his team:

“If I’m doing the work then I do it my way and I stand by what I’ve done. If someone who is working for me is doing the work then it depends on the final output I suppose and what perception, standards and that sort of stuff are. If it meets all the TransportServices Standards and our standards and that sort of stuff then it is up to the individual about how they go about it. I usually don’t make them do it my way (Malcolm, design drafter).

Malcolm’s comments indicate his respect for his subordinates’ expertise, trust in their informed judgement and willingness to provide some degree of autonomy in the decision-making process regarding task accomplishment. Organisational processes and procedures that maintain personal dignity, sense of self worth and respect for expertise (e.g. autonomy based upon established expertise and achievements), provide workers with evidence of organisational justice and social capital at the situated work practice level (Lind et al., 1993; Tyler & Degoe, 1995). So, these perceptions are a key predictor of affective commitment, perceptions of organisational support and helping behaviours such as knowledge generation and sharing. Perceptions of organisational justice inform workers’ beliefs about a climate that is psychologically safe.

Generation of process innovations requires an organisational climate that supports both initiative and psychological safety (Baer & Frese, 2003). For instance, improvements to the
way in which an action within a process is executed or recorded may exert a ‘ripple’ effect on subsequent and preceding actions, the workers responsible for those actions, and the overall system. So, knowledge may be generated where micro-level influences support innovation development, adoption and sharing.

Because my group has a fair bit of experience, as in being in TransportServices a long time, we get involved in work that’s not really our primary task because we have the knowledge (Duncan, engineer).

The breadth of experience of this group has resulted in knowledge at a more systemic level which is valuable to the larger organisation. This expertise is recognised through opportunities to participate in activities beyond their nominated job roles. The recognition of their expertise is reinforcing and demonstrates respect, an aspect of interactional justice which has been associated with organisational justice (Bies & Moag, 1986).

Similarly, decision-making processes which demonstrate fairness, trust and concern for workers support the development of worker’s perceptions of organisational justice. Gerald, who is a trainee, makes the following observations about the micro-level decision-making processes he has observed:

At the end of the day it does come down to the supervisor and the more experienced people to make the decision. But then again if it is a valid argument it is definitely spoken about and talked about to see if it would work – but at the end of the day it is the supervisors making the final decision. They are always willing to try new things and give it a go, but if it is something that is completely irrelevant and it won’t work they will say ‘no’ (Gerald, trainee).

Supervisors are observed by this trainee to exercise positional power (see Fiedler, 1967). However, they are also observed to be open to the ideas of others and prepared to implement workable suggestions arising from the team. The experience of fair treatment, respect for expertise and trust from the supervisor, fosters feelings of security and managerial trust in the worker. So, over time, the micro-level relational history and social practices
develop characteristics and perceptions of organisational justice. This is important for creating an environment and work practices which support personal orientations for the generation and sharing of knowledge.

Fair treatment from colleagues creates and maintains demonstrated procedural and process fairness, and respect for individual contributions. Henry illustrates this point:

Some ..... are persistent in their ideas to be put on drawings regardless of what other people are thinking. That will compromise the work actually … You have to consider other people working on the project, they also have a pride on what they are working on so you have to accept that (Henry, engineer)

Knowledge workers’ feelings that their expertise is valued and recognised for its contribution has been identified as important to their organisational commitment and retention (Lee-Kelley et al., 2007, Burgess, 2005). For instance, Malcolm comments: “There are other people in here who have been recognised for doing outstanding work on specific projects” (Malcolm, design drafter).

Feelings of not being recognised can reduce knowledge sharing orientation and practices, reducing the importance of group identification. Linking to the professionally-based characteristics of engineers and drafters, Cameron notes: “Engineers and drafters are very reserved in relation to their importance, they are part of the team” (Cameron, design drafter).

Strong team affiliations are not automatically associated with knowledge workers (Lee-Kelley et al., 2007). In this instance, two additional factors may influence the attitudes Cameron describes. Firstly, the engineers and drafters are, overall, characterised by extensive service history. It is, therefore, possible that due to the frequency and long term nature of interactions there is a strong degree of social embeddedness in the group. Social embeddedness (elaborated in Chapter Three) refers to the relational history, rewards and
norms developed over repeated social interactions with colleagues (Raub & Weesie, 2000) and is, therefore, a significant micro-level influence.

Secondly, (as already established), TransportServices is a public sector organisation. Public sector workers have been found to value recognition among peers and the organisation, as evidenced among the workers in this case (Buelens & Van den Brock, 2007; Houston, 2000). Public sector workers have been associated with lower interest in promotion, and higher value for a supportive working environment and helping others (Boyne, 2002; Buelens & Van den Broeck, 2007). Supporting Cameron’s comments, Henry describes how promotion results from a reputation among peers and management for knowledge and good work:

When you tell someone … what you know and you get experienced out there, it tends to give the impression that your works are the knowledge and essentially it come to (senior management) by people talking or something like that, good experience, yes, done good work and built properly. Then essentially by the end of the day you get promoted (Henry, engineer).

In Henry’s experience, expertise development creates opportunities for promotion, and promotion can be expected to arise from demonstration of expertise.

In contrast, where a worker feels that their contribution is not appreciated, their job satisfaction, commitment and identification with the organisation may lessen (Warr, 2002). Henry describes the feelings of a co-worker who recently resigned from TransportServices: “‘If they don’t recognise me why should I share the knowledge I have’ … he felt unrecognised” (Henry, engineer)

High levels of satisfaction with the organisation’s treatment at the individual worker level are important micro-level filters for individual workers’ perceptions about their treatment. They have been positively associated with stronger intentions to remain, organisational citizenship behaviours, and helping behaviours such as knowledge sharing (Hopkins & Weathington, 2006; Meyer & Allen, 1991; Saunders & Thornhill, 2003). Henry
notes here, the response of a former colleague who claimed that his expertise was not valued. The strength of these beliefs resulted in his resignation and a consequent knowledge leakage for TransportServices. So, beliefs of unappreciative or unequal treatment which have arisen over time can be so strongly held that an employee will search for a more supportive environment. In addition, perceptions about equality of opportunity were described:

TransportServices do have a mentoring program and coaching and that sort of stuff. It appears to be more for the hierarchy, the managers and that. They do say that it is available for any one to apply, but it gives you the impression that it is more for the hierarchy (Malcolm, design drafter).

This design drafter claims that there is stratification in the treatment of workers, namely, that in spite of a stated policy of equal opportunity, access to opportunities for professional development is based upon job level and differs according to the formal organisational structure. Such perceptions at the micro-level can have a negative effect upon workers’ beliefs that the organisation is concerned for fairness and respect in its processes.

In sum, beliefs about organisational justice and the nature of the exchange relationship create a micro-level framework for workers’ perceptions of fairness and rewards for constructive behaviour. Evidence that the organisation’s processes and procedures are fair reduces cynicism and positively influences behaviour orientation. In turn, these shape micro-level socially situated practices, task execution and capability-building behaviour such as innovation and knowledge sharing by workers. Additionally, innovation is fostered by demonstrations of support and encouragement, for instance, rewards for innovation. In the following section, data demonstrating the impact of rewards for innovation are presented and discussed.
Rewards for innovation

Rewards function to identify and reinforce desired behaviours for workers, and build normative commitment such that workers feel that they should remain with the organisation (Meyer & Allen, 1991). The outcomes should be positive for the individual and the organisation. Henry describes rewards he has personally experienced:

This morning we have an email for doing job well done just as a matter of rewarding the work that you do. Sometimes they give us a (reward) or something like that if we do our job well. Also like the one we got this morning inviting us to join a breakfast. Like a pat on your back. People notice not just when we do wrong, so when we do something good they also know. Something that is good for TransportServices (Henry, engineer).

Development of a work environment in which each worker’s contribution to the work process and outcomes is valued has been associated with successful innovations in the work processes (Edmondson, 1999). Further, when workers are encouraged to take a pro-active approach to their work, successful adoption of innovations is more likely (Frese et al. 1996). Respondents described a well established system designed to recognise and reward product or process innovation.

We have a Recognition and Reward program. Corporation supports it and promotes it … the essence of what the awards were really about, recognising the unsung hero for something (Dennis, design drafter).

I helped one of my colleagues within my own little section. He was doing some ground penetrating radar work and they did it within a very short time implementing new technology. They were really quite pleased with what was done and we had paper reports and somehow we were rewarded with gift vouchers. I think it is really positive. We are encouraged to nominate people for those sorts of things (Robert, engineer).

Dennis and Robert outline a rewards approach which incorporates two micro-level factors found to specifically encourage creativity: firstly, recognition from supervisors (see Tierney & Farmer, 2002), and secondly, recognition from co-workers (previously identified
by Madjar, Oldham and Pratt, 2002). The following data further illustrate the rewards experienced by Tom and Nick and their reactions:

In surveys section – there was developed a GPS mapping using a trolley car. It was nominated for a TransportServices ‘Achievement Unlimited Award.’ The photos were in the TransportServices magazine “All Aboard.” (Tom, engineer)

I got one in recent times. I was working on a fuelling facility (Nick, engineer)

Demonstrating a team-based orientation, Joe describes how the award received by his group for improvements was spent and achieved. His pride in developing an enhancement for the organisation’s capabilities while minimising inconvenience for the community is evident:

Our group won a $1000 award for improvements. We used the money to put on drinks for everyone on this floor. What we did was develop a way of replacing all of the timber bridges on the rail system. We built the new bridges beside the old and that allowed the tearing down of the old bridge and the slotting in of the new bridge to happen in one weekend. It was a tremendous improvement in down time and inconvenience to passengers and freight because it just happened in one weekend instead of over weeks (Joe, design drafter)

Respondents exhibit pride in their creativity, originality and contribution through their innovations. These examples demonstrate that the recognition and reward program is not isolated or rare. This is important in the present study: where reward systems for new knowledge generation or innovations are embedded in organisational processes and networks, they have been found to foster belief that the macro and micro-level environment value high performance (Damanpour & Schneider, 2006; Mumford, 2000; Wise, 1992). High performance climates are associated with lower levels of (a) ineffectiveness and (b) lost productivity (Stetzer & Morgeson, 1997).

Reflecting both the reinforcement received from recognition from his co-workers (Madjar, Oldham & Pratt, 2002) and his appreciation of the monetary benefit, William reacted to his award on more than one level: “It’s not the money, it is also satisfaction, recognition. The money is also good!” (William, engineer).
More strategically, Henry noted that there is now more interest in innovation compared with the conservative adherence to reproducing past, proven designs in order to assure safety: “Usually have engineers … do as what we usually do in the past, because so the design is safe, not falling apart …. So we are now more free to pursue our idea” (Henry, engineer).

Henry believes that he and his colleagues now have more freedom to pursue their own ideas, and potentially, to develop ‘new ways’. As he is a recipient of an award for a process improvement, he has experienced a reward for innovation and personal confirmation that knowledge generation is valued (Damanpour & Schneider, 2006).

In summary, this section has presented and discussed the dissertation’s findings in relation to micro-level support for knowledge generation and innovation in this organisation. An ongoing recognition and reward system is described by respondents as providing recognition and reinforcement at the macro-level from the organisation and at the micro-level from colleagues, and provides valuable satisfaction for recipients of awards. In essence, its continued existence provides evidence to workers that the organisation does, in fact, value the generation of new knowledge and dissemination of innovations and creative problem solving to the wider work group. In turn, workers understand a convergence of macro and micro-level endorsement which shapes their knowledge generation and sharing practices.

Conclusion

Within these workgroups, workplace norms and values are made explicit and reinforced. Individuals are more likely to exhibit positive behaviour in workgroups where these norms and values are common, expected and rewarded (Bommer, Miles & Grover, 2003). Existence of a positive climate for social relations and task accomplishment creates a
lens through which workers: (a) appraise the socially situated practices at the local level, (b) form beliefs about the nature of their engagement with the their supervisor and co-workers, and (c) make decisions about their obligations as an employee.

In Chapter Three, a priori micro-level constructs influencing workers’ knowledge generation and sharing orientation and practice were identified from earlier research, and summarised in Figure 4. Adopting a flexible, social constructivist approach to data analysis permitted these predetermined constructs to be adjusted, to incorporate workers’ descriptions of the mediational roles of the micro-level factors in their work setting.

In this chapter, data illustrating micro-level influences mediating individual workers’ knowledge generation and sharing behaviour at the local level have been presented and discussed and are summarised in Figure 8.

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<tr>
<th>Micro-Level Factors</th>
<th>Micro-level mediators</th>
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<td>Individual worker characteristics &amp; orientations</td>
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<td>Affective organisational commitment, e.g. trust between worker and organisation and its representatives</td>
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<tr>
<td>Relational history with co-workers, e.g. interactions, relationships and trust among workers</td>
<td>Relational history among co-workers</td>
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<td>Extent of organisational citizenship behaviours</td>
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Figure 8 Micro level factors mediating individual knowledge generation and sharing.

Figure 8 integrates and illustrates the mediating role and influence of micro-level factors upon workers’ knowledge generation and sharing in TransportServices. Firstly, the workers’ professionally and personally based characteristics and orientations have been found to create a framework to describe action at the micro-level. Factors such as ‘job fulfilment and
expertise’, ‘personal motivation’, ‘job engagement’ and ‘opportunities to operate autonomously’ and ‘to continuously learn’ were found to be important micro-level factors influencing workers’ knowledge sharing in this workplace.

Additionally, affective organisational commitment (including workers’ sense of identification with the organisation) and socially constructed, locally situated factors shaping commitment to organisational goals and norms have been identified. These stand as important, situated influences on individuals’ knowledge generation and sharing practices at the micro-level. Further, contributors to workers’ commitment and sense of identification were found to be the micro-level reinforcement provided by perceptions of behaviour and job outcomes, relational capital and social connections developed over time with their supervisor and co-workers.

Second, data presented in this chapter suggest that co-worker trust is an important factor mediating individual workers’ knowledge generation and sharing orientations. The development and maintenance of trust were found to be interpreted as evidence of predictability in: (a) reciprocal interactions, (b) promise fulfilment, (c) personal values in regard to task enactment and (d) behaviour promoting the organisation’s and workgroup’s sustainability. Co-worker trust was demonstrated to derive from workers’ perceptions about relational capital and their own interaction history with the group and other individual colleagues. As such, co-worker trust is an important micro-level factor mediating worker knowledge sharing orientation and willingness to engage in knowledge sharing practices with co-workers.

Third, specifically investing effort in developing micro-level personal relationships allowed respondents access to technical expertise, information, a network of ‘sounding
boards’ for testing ideas and technical problem-solving, and increased potential for developing non-standard ways of achieving the required outcomes. In turn, this investment created opportunities for knowledge generation and sharing to occur through fostering and reinforcing personal and task connections among workers. So, organisational citizenship behaviours and trustworthiness created a context for future, rewarding knowledge-related interactions through contributing to a climate of psychological safety.

Fourth, aligned to the influence of situational, relational factors on innovation, knowledge sharing and adoption of innovation, is the issue of rewards for innovation. Whereas the former can be seen as affordances for innovative practice, rewards were reported to be institutionally legitimated outcomes for innovation. Hence, rewards demonstrated macro and micro-level organisational justice in response to knowledge generation and sharing. These rewards, therefore, provided micro-level reinforcement of the value of knowledge generation and sharing practices in task accomplishment interactions.

In summary, this chapter has built upon the contributions of Chapters Five and Six which respectively presented data demonstrating the macro-level and socially situated influences on knowledge generation and sharing. It has advanced data that explains the micro-level influence of concepts which shape the development of workers’ relations with their colleagues and the organisation. In turn, these relations have been shown to mediate workers’ decision-making regarding extra role behaviours such as innovation and knowledge sharing. The contributions arising from the practical investigations, while consistent with those proposed in Chapters Two and Three, extend and further elaborate the propositions advanced in those earlier chapters. Further, these propositions have been elaborated in different ways
which illustrate the complexes of factors influencing knowledge generation and sharing in the organisation.

In the following and final chapter, the contributions of this dissertation to the field of knowledge generation and sharing are argued. The findings in the form of deductions are summarised and integrated in support of the proposition that knowledge generation and sharing are mediated by factors which influence the relations between individual workers and the organisation, and the relations among workers.
CHAPTER EIGHT

KEY FINDINGS, CONTRIBUTIONS AND CONCLUSIONS

The case advanced by this dissertation is that an organisation’s capacity to effectively use its knowledge is mediated by a range of relational factors. In particular, the knowledge sharing that is essential for organisational continuity is mediated by a complex set of relations between organisations and their workers, and the relations among workers. A comprehensive understanding of these relations of the kind provided here, contributes to the theory and practice of knowledge generation and sharing in organisations.

Initially, a literature review identified key premises through which knowledge generation and sharing might be understood. The study of those understandings adopted a longitudinal, single-case method, ensuring the socially constructed interpretations and perspectives of respondents in relation to the research proposition could be thoroughly investigated and elaborated. Multiple data sources were used to provide a range of accounts of knowledge generation and sharing to inform this elaboration.

Respondents were drawn from professional and paraprofessional occupations, because the professional sector has been identified as under-represented in knowledge generation and sharing research (Alvesson, 2004). In total, forty-six semi-structured interviews were conducted, that involved trainee, non-management and management levels of workers. Although the enquiry’s findings are context-specific and not necessarily generalisable, depth of contact was achieved through a series of interviews – commencing, progressive and summative – with most participants. Further, the research design evolved in response to factors and issues emerging from the initial data analysis, respondents’ insights and adoption
of opportunities to enhance the data collection (King, 1994), rather than statistical analysis of word or phrase frequencies to identify the importance of concepts. Extensive direct and illustrative quotations were used to present the case and ensure rich descriptions to support and illustrate the analyses and interpretation of the data across the three subsequent chapters.

This concluding chapter aims to summarise the key findings, identify contributions, propose implications for practice and indicate directions for future enquiry. It is structured in that order.

Key Findings

Overall, the findings here demonstrate that the investigated organisation’s capacity to effectively use its knowledge is mediated by a set of complex relational factors: those relations between organisations and their workers, and the relations among workers. Three main findings can be drawn from the enquiry and these are depicted in Figure 9.

Figure 9 presents workers’ decision-making about knowledge generation and sharing as being nested within three mediating complexes of factors arising from: (a) macro-level environmental factors, (b) socially situated practice and (c) micro-level mediating factors at the worker level. The analyses demonstrate how individual workers account for organisational and local issues in this decision-making process, which is influenced by the outcomes of earlier, personal experiences, interactional history and beliefs at macro, local and micro levels of activities and decision-making.
Influence of macro-level environmental factors

First, environmental complexity was found to create the standing pattern of behaviour (Barker, 1968) for interactions between workers and the organisation, and among workers, for task accomplishment. In turn, these interactions influence a range of external and internal bases for action, including the generation and sharing of knowledge. These bases influence workers’ beliefs about what is important, their interpretation of their experiences, and the practices they subsequently enact in both generating and sharing knowledge. As depicted in
Figure 9, occurrences which further shape workers’ knowledge generation and sharing beliefs and practices, occur at the locally situated and individual levels within the workplace setting.

Macro-level environmental factors important for knowledge generation and sharing, were found to be: (a) the organisation’s mission and characteristics, (b) the nature of the industry and profession, (c) drivers for change, and (d) the impact of the work nature and demands. For instance, pressure for conservative action was found to arise from the parliamentary, media and public scrutiny associated with the organisation’s public sector role and purposes, and these pressures were prone to discourage innovation and knowledge generation. Importantly, an outcome of this scrutiny and the workers’ commitment to the public good is a history of safety, reliability and norms of design excellence. Databases of design standards provided both important compliance information and repositories of successful work outcomes. However, the existence and standing of such databases can constrain review of and alternative approaches to established norms and practice.

The organisation’s structural arrangements were found to shape knowledge generation and sharing practices. The organising principles adopted within organisations may result in functional units separated by task (e.g. engineers) and/or cross-functional groups (e.g. combining specialised expertise in teams as required for projects). This investigation identified that where functional arrangements were in place, specific profession-based expertise was confined within separate sites of socially constructed practice and contextualised knowledge. Consequently, innovation through access to alternative perspectives, potential for knowledge sharing and knowledge access may be reduced. These findings support Gammack and Stephens’ (1994) earlier findings that the systemic structural relations of the organisation mediate knowledge generation and sharing.
Not surprisingly, workers’ actions in this organisation were found to be shaped by the norms and values of their formal, profession-based training prior to joining the organisation. Knowledge construction processes provided organisation members with a strong sense of professional, industry and organisational identity. This process of learning was found to be influenced by personal and vicarious experiences at macro-level environment, situated and individual micro-levels, generating perceptions and beliefs about organisational values, locally situated practices and personal orientations to action in regard to knowledge generation and sharing.

In addition, the findings of this dissertation highlight the impact of knowledge leakage (i.e. reduction or loss of the organisation’s unique combination of knowledge and personnel resources which constitute its differentiation to customers):

1. Knowledge leakage occurs through knowledge sharing exchanges that constitute knowledge leakage for the knowledge provider, potentially reducing their competitive advantage through increasing the knowledge of other operators in the market. For instance, external contractor engineers and design drafters are used extensively by TransportServices and provided with access to uniquely held organisational and discipline knowledge. However, these contractors do not always possess knowledge or skills such that the interactions reciprocally contribute knowledge capability to the knowledge-providing organisation.

2. Knowledge leakage was found to arise when the deep, specialised knowledge developed over extensive work histories by long-serving workers is not understood and valued in the host organisation. So, loss of expert
members, over time, may reduce an organisation’s sustainability as its unique resource and skill capability is reduced, unless specific mechanisms are in place to support knowledge sharing.

Influence of socially situated and constructed practices

The second key finding was an elaboration of how the socially situated and constructed practices of the knowledge collective mediate knowledge generation and sharing. As depicted in Figure 9, these socially situated and constructed practices occur within an organisation’s external and internal environment. The macro-level environmental factors, therefore, create the context for local values, beliefs, norms, relations and professional practice.

Knowledge construction was found to occur through participation in the socially situated practice, adaptation and reflective practice of the day-to-day activities in the organisation. Acquisition of knowledge is contextualised and developed locally through interactions with more expert co-workers and task enactment. Formal induction processes are found to be helpful mechanisms for locating novices within important social and work practices. In turn, this facilitates novices’ role and relationship negotiations, providing valuable access to more knowledgeable, senior and experienced workers. The work and social orientations of individual workers are, therefore, found to develop through initial socialisation processes, and to emerge from their relational framework.

Knowledgeable workers are found to function as conduits to the local and wider organisational memory (e.g. project and task history, successes, failures), values, norms and identity. Communication and relations with others are demonstrated to be central to
communication processes that facilitate the knowledge and skill development of novices and other workers.

Innovation was sometimes found to be discouraged by pressure to conform. Pressure arose from relations with others, organisational and locally constructed work practices and requirements, and the technical frameworks of the engineering and design drafting professions. Conversely, innovation was shown to be fostered by the nature of the professional and paraprofessional work undertaken. This is because much of the work is project and group-based and technically challenging, thereby requiring adaptiveness, willingness to trial new modifications to past practice and openness to alternative or new solutions. Therefore, knowledge generation occurred through contextually situated task accomplishment.

So, workers’ knowledge generation and sharing practices were shown to be subject to: (a) the contestations and negotiations between their relations and orientations, (b) processes through which expertise is constructed and developed and their profession is practiced within the sites of socially constructed practice and contextualised knowledge, (c) value attributed to knowledge and expertise, and (d) the potential for knowledge leakage arising from dissonances in work practices and workers’ beliefs.

Influence of micro-level factors

The third key finding elaborates how micro-level factors influence individual workers’ preparedness to contribute to the knowledge of the organisation. As depicted in Figure 9, the context for workers’ day-to-day professional practice is established by factors present in the organisation’s external and internal environment. These factors shape practices, values, norms and relations at the locally situated level. In addition, workers exercise their individual agency at the micro-level, in decision-making for knowledge generation and sharing. This is salient
because organisational functioning at macro and locally situated levels occurs through the actions of individual workers. In turn, individual workers’ actions arise from their interpretation of their situation, and their consequent orientation to action (Blumer, 1969).

The belief of these professionals and paraprofessionals that their work contributes value to the public good and to the organisation is important for their workplace and job engagement, knowledge generation and knowledge sharing. Further, job fulfilment, personal motivation, opportunities to learn, develop and work autonomously, were found to be important micro-level contributors to affective organisational commitment. The degree of identification by these workers with their professions’ values and practices, the organisation’s business goals, and public sector values also underpins workers’ willingness to share their personal expertise.

Co-worker trust was identified as an important micro-level mediator of knowledge sharing practice. This trust was reported as arising from workers’ perceptions about relational capital and workers’ personal interaction history with their immediate and other colleagues. Trustworthy behaviour demonstrated over time by co-workers provides a basis for judgements regarding the value of reciprocal knowledge exchanges, promise fulfilment, personal values and actions to advance the capabilities of the local knowledge collective and the larger organisation.

Finally, beliefs about how innovation is organisationally valued were found to be fostered by experiencing rewards for innovation. Rewards provided evidence and reinforcement at the micro-level that individual workers would be rewarded for knowledge generation, through innovation and innovative practices. This is important to individual workers, in confirming that a safe environment exists for questioning, modifying or replacing
accepted work methods. In turn, workers understand that where innovation contributes to the construction of knowledge and capability, the organisation will recognise and reward individuals and groups. Workers understand this as both legitimisation of their contributions and encouragement to go beyond existing ways of thinking and acting in meeting the organisation’s strategic goals.

These research findings are depicted in Figure 10.

Figure 10 The influence of macro-level factors, socially situated practices and micro-level mediators on knowledge generation and sharing practice

As summarised in Figure 10, these findings indicate that individual and collective knowledge generation and sharing do not occur in isolation or separately within the organisational setting. Rather, they should be considered to occur within the organisational setting.
and local contexts and relational settings of individual workers’ day-to-day work practice. In short:

1. Knowledge generation and sharing are mediated by factors arising from the complexity of the organisation’s environment, e.g. the organisation’s mission and characteristics, the nature of the industry and the profession, and drivers for change. As established in Chapter Three, the demands of the macro-level context influence workers’ constructions of desirable values, practices and behaviours. These, in turn, form orientations to actions that will facilitate knowledge generation and sharing.

2. Knowledge generation and sharing are mediated by socially situated practices, incorporating contested workplace relations, how expertise is constructed in the local practice setting, how innovation and expertise are valued within the socially situated practice, and knowledge leakage occurring through events as described above. These practices arise from the context of locally situated, socially constructed practice sites. In turn, they guide workers’ interpretations and sense-making in their local practice setting and, hence, shape workers’ knowledge sharing practices and behaviours enacted in that setting.

3. Knowledge generation and sharing are influenced by micro-level mediators, specifically, individual workers’ characteristics and orientations, the relational history among workers, and each worker’s interpretations of the evidence of outcomes and rewards experienced at macro and local levels. Such mediators are described as micro level because they exist and are influential in mediating individual workers’ interactions. These micro level factors provide a lens
through which individual workers view the outcomes of their interactions and actions, and as such, mediate workers’ decisions about their future behaviour.

Significantly, micro-level mediators were found to act in addition to and likely over-ride, overall macro-level considerations in workers’ knowledge sharing decision-making processes. In all, these levels are inter-related and represent a complex of relational factors that shape knowledge generation and sharing.

Building on the general model presented in Figure 9, Figure 10 presents the three key findings of this research. Although these findings are context-specific and not necessarily generalisable, the measures described in Chapter Four to ensure rigor (i.e. extensive review of previous findings, careful research design, sensitivity to emergent findings and thorough data analysis procedures) strengthen the likelihood that these complexes of factors are not restricted to the targeted organisation alone. Certainly, the limitations created by the single-case approach raise questions about generalisability. However, the primary purpose of the case presented through this dissertation is an explanation of a specific phenomenon within one workplace setting. The individual nature of the responses means that the information and claims provided by respondents are influenced by their personal experience, and may, therefore, be impossible to reproduce, as is typical in studies of this kind. However, in response to changes within the setting and emergent data, modifications to the planned research procedures were deemed necessary, resulting in expansion of the data collection and additional insights which enriched the findings (e.g. regarding the induction process and contested workplace relations experienced by trainees).

In the following section, the dissertation’s contributions to the literature are specified. In all, they advance understanding about the generation and sharing of knowledge required to
sustain organisational capability and knowledge resources, through expanding knowledge about the mediational influence of the relations between organisations and their workers, and the relations among workers.

Contributions

The need to develop a more substantive body of theory about knowledge generation and sharing has previously been proposed by Hawkins (1994), Miner & Mezias (1996), Snyder and Cummings (1998) and Tsang (1997). Easterby-Smith (1997) suggests further research recording both successes and failures in the implementation of knowledge generation approaches is required, noting the dependence of management theory on individual organisation ‘success stories.’ Teece (1998, p. 289) suggests that the “already significant literatures on the management of technology, entrepreneurship, innovation, and business strategy” be developed and extended, through integrating knowledge gained from those fields, with insights available from accounting, economics, organisational behaviour, marketing, sociology, and strategy. In taking up this challenge, this dissertation makes four key contributions:

1. The complexes of factors that shape how knowledge is generated and shared within organisations are identified and elaborated;
2. The central influence of an individual’s workgroup role and level on knowledge sharing behaviour is identified;
3. Reciprocity between the nature of individual workers’ relations with the organisations and their knowledge sharing orientation and practices are elaborated; and
4. The importance of the individual’s relations with other workers for their knowledge generation and sharing practice is established.

These contributions collectively advance the integration of issues shaping knowledge generation and sharing within an organisation.

Multiple, nested relationships and levels of factors shape knowledge sharing

Firstly, this research contributes to the literature by identifying the complexes of factors that shape how knowledge is generated and shared within an organisation. These have previously been identified separately or in partial combinations. (e.g. see Antonacopoulou, 2006; Haynes, 2005; Hislop, 2003a; Lanzara & Patriotta, 2001).

Consequently, a central contribution here is to elaborate the nested, over-lapping and relational factors mediating workers’ knowledge generation and sharing. Models illustrating influences on knowledge sharing have previously been presented (e.g. see Cabrera & Cabrera, 2005; Lawrence et al., 2005). However, the conceptualisation provided here about workers’ decision-making processes concerning knowledge generation and sharing account for specific, multiple levels of frameworks and relational interactions, and go beyond what has been advanced elsewhere.

Workgroup role and level influence knowledge sharing

Secondly, illuminating the influence of an individual’s workgroup role and level on knowledge sharing behaviour, is also a helpful contribution. This addresses a gap identified previously by Thompson and Heron (2006). Mapping this influence is important to advancing understanding of the links among affective commitment, the psychological contract and knowledge sharing. Indeed, Alvesson (2004) notes the lack of studies examining “what
professionals and knowledge intensive organizations do at work” (p. 58), which has been approximated here.

This contribution extends understanding of how knowledge generation and sharing are contested processes, mediated and shaped by the nature of relations among workers and their regard for the organisation at the time of the knowledge interaction. Relations with other workers are influenced by the interactional history among workers and the complex of factors within the local practice site. Political dimensions of knowledge sharing arise from differences in value systems, power relations, group memberships, individual norms and beliefs, and differential access to information resources. Therefore, this contribution illuminates the interrelatedness between knowledge flows and behaviour, identified by Willem and Scarborough (2006).

*Individual workers’ relations with the organisation mediate their knowledge sharing orientation and practice*

Thirdly, this dissertation has elaborated links between the individual worker’s relationship with the organisation, and their knowledge sharing orientation and practices, that has also been identified as inadequately addressed (Thompson & Heron, 2006). Examination of the relationship between commitment and knowledge sharing attitudes and behaviour has also been called for by Hislop (2003a), who identifies the importance of the employment relationship for commitment and knowledge sharing.

Knowledge generation and sharing practices, therefore, are likely mediated by individual workers’ personal, higher-level values and orientations to practice. These values and orientations are found to be reinforced by locally constructed beliefs about relational capital and social connections, developed over time with their supervisor and co-workers.
They are further reinforced by the experienced outcomes of their task accomplishment, interactional history with supervisors and individual co-workers, and previous knowledge sharing exchanges. For instance, knowledge sharing behaviour is facilitated where the knowledge seeker is perceived to demonstrate organisational commitment. Further, knowledge sharing tends to be enhanced by individual workers’ beliefs that they receive fair and just treatment from the organisation’s representatives at their situated, day-to-day level. The elaboration of these relationships stands as a contribution that should be welcomed by those seeking to understand learning and development within organisations.

Workers’ knowledge generation and sharing engagement are shaped by relations with co-workers

Fourthly, perhaps the most salient contribution of this research is through identifying how individual workers’ participation in socially situated practice and the organisational benefits derived, are dependent upon and shaped by the nature and other dimensions of their relationships with other workers. This locates the role of individuals at the forefront of the knowledge construction and sharing process. It demonstrates that in selecting and interpreting their personal and vicarious experiences, individuals learn and generate what they believe is meaningful for the operational context, based upon their perceptions and assessments of the information source and their own purpose.

In the past, attention has been given to knowledge management in regard to organisational processes and information management systems (e.g. Currie & Kerrin, 2004; Milton et al., 1999). Less attention has been directed towards: (a) the contested nature of the process of knowledge construction, (b) the impact of the individual worker’s experience of the
organisation’s external and internal environments on shaping their knowledge sharing orientation, (c) how the organisation is understood to value knowledge sharing, and (d) the impact of relations with co-workers on knowledge sharing practice. Osterlund and Carlile (2006) highlight the need for additional empirical studies incorporating relational thinking when dealing with knowledge sharing in complex organisations. This contribution, therefore, specifically addresses gaps recently identified in regard to three issues important for knowledge generation and sharing, as depicted in Figures 9 and 10.

In summary, this dissertation contributes to understanding important elements of knowledge generation and sharing that have been identified by others as requiring further elaboration: (a) the influence on knowledge generation and sharing of the industry, profession, the organisation’s mission and characteristics; (b) the impact of individuals’ beliefs about their relationship with the organisation on their knowledge sharing orientation and practice (Hinds & Pfeffer, 2003), and how the organisation is perceived to value individual knowledge and encourage knowledge sharing (Bock et al., 2005); and (c) the influence of interpersonal factors on individual workers’ decisions to share what they know with colleagues (Tagliaventi & Mattarelli, 2006). Collectively, these contribute to understanding the potency of the mediational effects of the complex set of relations that influence workers’ knowledge generation and sharing practice in organisations.

In the following section, implications for organisational practice arising from this research are specified.
Implications for Practice

Organisations need to understand their strategic objectives and organisational knowledge capacity in relation to their operating environment, to develop and exercise the capabilities essential for identity, survival and growth (Grant, 1996). Incorporation of new knowledge into the organisation’s broader operations enhances inimitability of the organisation’s capacities, outputs, processes and practices (Kogut & Zander, 1997), and takes place through knowledge sharing (Szulanski, 1996; Zahra & George, 2002). So, the processes by which knowledge is generated and shared beyond the individual worker or group should be understood and supported by managers, to assist workers in moving beyond competent use of their organisation’s systems and processes, to the critique and development of improvements which enhance sustainability (Alvesson, 2004; Senge, 1990). Figure 9 depicts the integration of key mediators and their influence on the individual worker’s beliefs, orientations and practice. Some implications arising from this research follow.

**Impact of organisations’ structural arrangements for knowledge sharing**

First, organisations should give attention to the structural arrangements by which their operations are managed. These arrangements provide forces which act against horizontal knowledge flows (e.g. specialised functional units as knowledge domains), and facilitate horizontal knowledge flows (e.g. multi-skilled project teams bringing together members of different knowledge sites). Attempts to address this on a larger scale, (i.e. through re-alignment of sections into larger multi-function groups), were introduced during the course of the investigation that informs this research. However, inadequate communication processes caused staff to claim knowledge leakage resulted from the changes. Therefore, clear
communication of the purpose of structural change, specifically linking the change to organisational, local and knowledge sharing goals, are required, if these goals are to be achieved.

_Databases: facilitators or barriers for knowledge generation?_

Second, managers and workers need to be sensitive to the impact of organisational memory for knowledge generation and innovation. It has been suggested that established norms (e.g. databases, sets of policies and procedures or design libraries such as the Standards) can create barriers to knowledge generation and sharing (Argyris, 2004). One contribution of these databases lies in providing a repository of organisational memory for successes, standards of excellence and safe practice. However, where the purpose is only compliance, these databases may impede innovation and knowledge generation.

Management should seek to ensure that such norms are reviewed at regular intervals, updated where necessary, and, once safety requirements are satisfied, are understood to provide a platform for creative problem-solving. This is important for innovation, which might otherwise be discouraged by pressure to conform to sector, organisational and local norms, values and established practices.

_Attention to relationship-building processes_

Third, an important implication arising from this dissertation is the evidence establishing the importance for knowledge generation and sharing of individual workers’ job fulfilment, personal motivation, job engagement, opportunities to learn, develop and to work autonomously. Initial socialisation processes which locate novices within their social and situated knowledge practice sites are found to be important for knowledge generation and
sharing. The role of socialisation processes in facilitating novices’ role and relationship negotiations is not always appreciated, when an instrumental, task-focus frames the design and expected outcomes. Moreover, the relationship-building aspects of these processes may contribute to positive affective organisational commitment, found to facilitate knowledge generation and sharing orientations and outcomes.

*Rewards for capability-building behaviours*

Fourth, high levels of mutual engagement, collaboration and willingness to assist others can enhance locally situated knowledge. So, management and workers should understand that knowledge building in this way is valuable and contributes to relational capital and a climate of psychological safety for knowledge sharing. These behaviours should be highlighted, fostered and rewarded. Sustained, generalised trustworthy behaviour has also been found to enhance knowledge exchanges. Conversely, perceptions by co-workers that knowledge sharing interactions are primarily instrumentally-based might confine exchanges to narrow task outcomes rather than capability enhancement. Subsequently, future access to deeper technical expertise, information and opportunities for collaborative problem-solving may be reduced on the basis of such perceptions.

Therefore, communicating, reinforcing and rewarding capability-building behaviours may result in improved relational capital and organisational sustainability. Evidence that these behaviours are valued in the local practice site and the larger organisation should be consistently supported by managers in their role as representatives of the organisation’s values to workers.


Enhancing knowledge sharing by expert workers

Fifth, supporting knowledge sharing by expert workers as they near exit from the organisation is likely to assist maintenance of the organisation’s knowledge base. Identification of expert workers across the range of skill and knowledge arenas of the organisation’s operations, and monitoring of impending retirements and exits, is important for all organisations. While mentoring processes are common, mentoring objectives, activities and outcomes should be communicated, structured and monitored, to ensure knowledge sharing occurs as desired.

Access to structured mentoring by workers with special expertise is commonly provided for novice and high potential workers. In addition, mentoring opportunities should be designed to ensure that mid-career employees also benefit from planned knowledge sharing mechanisms. Such access will develop their knowledge and skills to the next level and foster affective commitment by demonstrating that they are valued by the organisation. Mentors should receive reinforcement, recognition and rewards for their contribution to the organisation’s capability-building. Further, organisation policies should make explicit an organisation’s expectations that knowledge sharing through coaching and mentoring of co-workers is expected and valued.

Fostering innovation

Finally, the importance of fostering, recognising and rewarding knowledge generation and innovation has been established as a priority for organisations which possess unique knowledge and wish to maintain their competitive edge in their marketplace. This research has identified four implications for innovation. First, discretion to question accepted practice
creates opportunities for workers to develop alternative and new ways, thereby increasing the potential for knowledge generation, even in regard to routine tasks. Second, pressure to conform to established practice safeguards safety and reliability standards; however, once these important requirements have been satisfied, ability to adapt and create different solutions to standard problems will result in knowledge generation. Next, the deep, specialised knowledge of long-serving workers, passionate about their work, should be accessed to identify critical incidents in which both successful and unsuccessful outcomes were achieved to identify key factors and develop new approaches to business building opportunities. Finally, intense workload pressure inhibits time available for social interaction – essential for relationship building, idea generation outside of immediate tasks, and contact with knowledgeable workers outside the individual’s situated practice site. Forward planning and workload allocation by managers should provide time, work arrangements and support mechanisms to create these opportunities for important knowledge generation and sharing.

Avenues for Future Research

Further research could fruitfully be carried out to extend and expand comparison with the findings, deductions and contributions reported in the present enquiry. Four directions for future enquiry are proposed.

First, the findings in this research were obtained from investigations in a public sector organisation. In order to expand the generalisability of these findings, similar investigations could be conducted within organisations in the non-profit and private sectors to provide a basis for comparing mediating influences on knowledge generation and sharing across sectors.
Second, this research was conducted within a large, geographically dispersed organisation which provides infrastructure services. Additional studies of these issues, located across a range of small, medium and large organisations providing a range of services to customers, could build further evidence to confirm, expand or provide alternative explanations for the findings of the present study. Different organisational settings and contexts may demonstrate a range of sets of complex factors shaping workers’ knowledge generation and sharing decision-making.

Third, as the research described in this thesis was conducted with engineers and design drafters, research within professions with different orientations, norms and values from the present respondents, may fruitfully build understanding about knowledge generation and sharing orientations and practice among professionals. In turn, more comprehensive information may facilitate comparison and identify useful knowledge generation and sharing practices for introduction across profession-based contexts.

Fourth, adoption of large-scale, quantitative designs might increase generalisability. However, the qualitative approach of this investigation produced richness of data that may be lost in large-scale designs. Indeed, mixed-method approaches may ensure that respondents’ views can be analysed in depth and provide more extensive data for analysis.

Conclusion

The importance of knowledge generation and sharing for organisations’ sustainability and innovative capacity has been established by a growing body of work (e.g. see Bogner & Bansal, 2007; Eisenhardt & Martin, 2000; Spender, 1996). Pressure arising from globalisation (Bartlett & Ghosal, 1989), technological change and structural changes in the economies and
nature of organisations (Dunphy & Stace, 1992; Handy, 1990) provide pragmatic imperatives for knowledge generation and sharing as a means of maintaining competitive edge. Underpinning competitive edge is an organisation’s unique combination of resources, capabilities, processes and practices derived from workers’ personal expertise, capabilities, social knowledge relationships, networks and social structures.

This dissertation contributes specifically to the conceptualisation of organisations as constituted by sites of locally constructed, socially situated knowledge practice, where knowledge generation and sharing are enhanced or impeded by relational capital and interactional history among such sites and their workers. It has identified three key influences: (a) environmental complexity, (b) socially situated practice and (c) micro-level mediators, which shape workers’ knowledge generation and sharing orientations for task accomplishment. This dissertation presents and illuminates the factors which workers account for and are influenced by in the processes of generating new knowledge and sharing what they know with others at work in the host organisation, and in ways that advance our knowledge of the phenomena. It also provides a basis for additional research on the relationships established here, in other behaviour settings.
APPENDICES
Appendix 1

*Participants’ attributes*

<table>
<thead>
<tr>
<th>Case code</th>
<th>Pseudonym</th>
<th>Length of service</th>
<th>Classification</th>
<th>Job level</th>
</tr>
</thead>
<tbody>
<tr>
<td>RES01</td>
<td>Barry</td>
<td>More than 20 yrs</td>
<td>engineer</td>
<td>supervisor</td>
</tr>
<tr>
<td>RES02</td>
<td>Dennis</td>
<td>Less than 5 yrs</td>
<td>paraprofessional</td>
<td>manager</td>
</tr>
<tr>
<td>RES03</td>
<td>Robert</td>
<td>Less than 5 yrs</td>
<td>engineer</td>
<td></td>
</tr>
<tr>
<td>RES04</td>
<td>James</td>
<td>More than 20 yrs</td>
<td>engineer</td>
<td>manager</td>
</tr>
<tr>
<td>RES05</td>
<td>Tom</td>
<td>10-20 yrs</td>
<td>engineer</td>
<td>supervisor</td>
</tr>
<tr>
<td>RES06</td>
<td>Nick</td>
<td>10-20 yrs</td>
<td>engineer</td>
<td></td>
</tr>
<tr>
<td>RES07</td>
<td>Cameron</td>
<td>More than 20 yrs</td>
<td>paraprofessional</td>
<td></td>
</tr>
<tr>
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<td>Henry</td>
<td>More than 20 yrs</td>
<td>engineer</td>
<td></td>
</tr>
<tr>
<td>RES09</td>
<td>Joe</td>
<td>More than 20 yrs</td>
<td>paraprofessional</td>
<td>supervisor</td>
</tr>
<tr>
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<td>Angus</td>
<td>5-10 yrs</td>
<td>paraprofessional</td>
<td></td>
</tr>
<tr>
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<td>Malcolm</td>
<td>More than 20 yrs</td>
<td>paraprofessional</td>
<td></td>
</tr>
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<td>RES12</td>
<td>Roger</td>
<td>More than 20 yrs</td>
<td>engineer</td>
<td>manager</td>
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<td>Duncan</td>
<td>More than 20 yrs</td>
<td>engineer</td>
<td>supervisor</td>
</tr>
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<td>William</td>
<td>10-20 yrs</td>
<td>engineer</td>
<td></td>
</tr>
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<td>Less than 5 yrs</td>
<td>engineer</td>
<td>manager</td>
</tr>
<tr>
<td>RES16</td>
<td>Derek</td>
<td>More than 20 yrs</td>
<td>paraprofessional</td>
<td>manager</td>
</tr>
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<td>Less than 5 yrs</td>
<td>engineer</td>
<td>graduate trainee</td>
</tr>
<tr>
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<td>Frank</td>
<td>Less than 5 yrs</td>
<td>engineer</td>
<td>graduate trainee</td>
</tr>
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<td>Less than 5 yrs</td>
<td>paraprofessional</td>
<td>cadet</td>
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<tr>
<td>RES20</td>
<td>Ian</td>
<td>Less than 5 yrs</td>
<td>paraprofessional</td>
<td>cadet</td>
</tr>
</tbody>
</table>
Appendix 2

Schedule of Interview Questions: first interview
Schedule of Interview Questions

First Interview

Name of Interviewee: ____________________________________________________________
Identifier: ___________________________________ Date: ______________________

Explanation of purposes of this interview:
Gathering information about (i) you, (ii) your workplace, and (iii) the sharing of information in the workplace.

About you
1. Could you describe the kind of work you currently do here?
   __________________________________________________________
   __________________________________________________________
   __________________________________________________________

2. How long have you been doing this work?
   __________________________________________________________
   __________________________________________________________
   __________________________________________________________

3. What did you do before this job? (Could you please provide a brief personal history of your educational and work background leading up to this job?)
   __________________________________________________________
   __________________________________________________________
   __________________________________________________________

4. Which work has been of most interest to you? Why is/was that?
   __________________________________________________________
   __________________________________________________________
   __________________________________________________________
About your work and workplace

5. What is the overall **purpose of this organisation**?

____________________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________

6. What **events** have happened for it to achieve this purpose?

____________________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________

7. What is the purpose of this **area/workgroup**?

____________________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________

8. What **events** have happened for it to achieve this purpose?

____________________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________

9. **Who** do you work with here?

____________________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________

10. **Why** is that?

____________________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________

11. What is the **organisational structure** here?

____________________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________

12. What is most **demanding** about your work?

____________________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________

13. **Why** is that?
14. What parts of your work do you find most fulfilling?

15. Why is that?

About the sharing of information in your workplace

16. How do you usually find out what’s going on here?

17. What are the kinds of everyday information that are shared in this workplace?

18. How is information about everyday tasks shared?
   - what sort of thing is discussed or communicated by each:
     a. Emails? Y / N
     b. Informal discussions between colleagues: Y / N
     c. Team meetings? Y / N
     d. News letters? Y / N
     e. Memos? Y / N
19. Tell me about a situation where information sharing worked well?

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20. Why did it work well?

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21. Can you describe an example where it did not work well?

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22. What do you think went wrong?

___________________________________________________________________________

In the next few days, could you think about the normal, usual communication processes, and then think about something novel or unusual that’s happening – that is an exception to the normal process in some way.

May I phone you to ask you about this example? Y / N

Your phone number? ________________________________

Thank you for your participation
Appendix 3

Schedule of Interview Questions: second interview
Schedule of Interview Questions

Second Interview

Name of Interviewee: _____________________________________________________________
Identifier: ____________________________________________________________________

Explanation of purposes of this interview:
Gathering information about: (i) work and communication; (ii) sharing information at work; and (iii) knowledgeable others in the sharing of information

1. Clarification, verification and probing of items & interesting leads from first interview
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Work and Communication

2. What information guides you on a day-to-day basis?
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3. How you get hold of information needed to complete day to day tasks?
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   a. Who decides what information goes to particular areas or teams?
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   b. Who decides what information comes to you?
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4. Tell me about a situation you remember when you felt unsure about what to do: –
   What happened?
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5. Is there any information that you need but don’t have ready access to?
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c. Why is that?
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d. How do you access it?
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6. Do you ever have to contact someone in another part of the organisation to get the information you need? Why?
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7. Would you ever go to someone you know who is outside the organisation but would know what you need to find out e.g. professional colleagues, competitors?
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**Sharing information at work**

8. When you have a new idea, or a new way of doing something, who would you discuss that with?
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9. a) **In your workgroup or department how often do people:**
- Discuss/volunteer information about what they are doing
b) Volunteer/Share information about useful or special things they’ve learned, discovered, or achieved good results on?

10. a) In what situations do you share your knowledge or work together with the people in another section or department.

b) How easily does this happen?

c) Would you say you share information more readily within or outside your workgroup?

d) What sort of knowledge or information do you share?

e) Is the knowledge sharing typically about equal or one way more than the other?

11. Have you ever stopped short of sharing everything you know in a work situation? What happened
12. Do you find there are some people that you share knowledge with more freely than others? Why is that?

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13. Have you ever been in a situation where you knew you weren’t going to pass on everything you know? What happened?

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14. To what extent would you say that your own knowledge sharing is sometimes influenced by how you view the other person, eg your regard for them or your feelings about them?

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**Knowledgeable others and sharing knowledge at work**

15. How is information and knowledge developed in one area is made accessible to other areas (e.g. is it available through newsletters, email notices, shared access to files, workshops, training activities, mentoring programs)?

____________________________________________________________________________
____________________________________________________________________________

16. Who in the section or department do you consider to be really knowledgeable or valuable: What do they know or do that makes them stand out as valuable?

____________________________________________________________________________
17. Tell me about an example or incident that shows how their special knowledge made a difference?
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18. Have any of your ideas been adopted here? What happened?
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19. How do you think sharing of information within the section be increased, while ensuring that key commercial information is protected?
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20. What are the most important influences on how knowledge is shared around here?
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21. Tell me about a situation that shows this
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22. When is knowing how to get the ‘system’ to work for you crucial in achieving a successful outcome, in other words, knowing how to get something done is almost as important as knowing what had to be done? The situation can be one you observed or one in which you were personally involved.
23. Tell me about a situation where a person or group has been rewarded for a new idea or way of doing things, or some kind of improvement, eg through some kind of award or being photographed for the company newsletter, or having their idea adopted throughout the organisation?

20. When there are meetings here, which discussions do you get involved in? What tend to be the issues on which you contribute?

21. Is there anything else you would like to add before we finish?

Thank you for your participation
Appendix 4

Schedule of Interview Questions: third interview
Schedule of Questions – Third Interview -

Name of Section you work in: ____________________________________________________

Identifier __________________________________ Date: ______________

Explanation of purpose of this interview: Gathering information about:

(i) Building knowledge & expertise; (ii) communication between newcomers and old-timers; (iii) support for professional development and (iv) retaining knowledge in the organisation

1. Follow up from previous interview.
   ________________________________________________________________
   ________________________________________________________________

   Building knowledge & expertise

2. How will this area attract and recruit new engineers and drafters?
   ________________________________________________________________
   ________________________________________________________________

3. I’d like you to think about an example of a new engineer or drafter joining the group straight after finishing their studies.
   3.1. What are the sort of things they would need to be inducted into?
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   ________________________________________________________________
   ________________________________________________________________
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   ________________________________________________________________

   3.2. How would you induct them?
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3.3. What do they need to know to become fully functional?
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3.4. How do they learn to become fully functional?
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4. What would happen if someone new did not observe the usual process of consultation and communication?
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4.1. Can you give an example?
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Information sharing and helping between old-timers and newcomers

5. Tell me about any situations where a more experienced person may have helped a less experienced person’s progress by giving them access to more advanced work
6. In what ways do more experienced workers support less experienced workers here?

7. Do you know of any situations where someone’s progress has been slowed through not getting access to opportunities or more advanced work?

8. Can you recall any situations where there were tensions or differences of opinion between ‘experienced hands’ and ‘newcomers’ about how things should be done? What happened?

9. Thinking about people you believe are ‘expert:
   9.1. In what ways are they ‘free’ with their knowledge? Do they readily share it with others or would you say they use it to create a position of influence?

   9.2. On what basis would they decide to share or not share their knowledge?

10. Can you recall a situation where someone has used their particular knowledge to gain a reputation as an expert, to gain a promotion or a position with another firm?
Questions about your knowledge sharing

11. Thinking about your own knowledge and area of expertise, would you say you are ‘free’ with your knowledge – do you readily share it with others?

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12. Can you give me an example of how you shared your knowledge recently;

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13. On what basis do you share your knowledge?

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14. There are a number of ways that special projects or team contributions are recognized here. How are an individual’s special knowledge or expertise usually recognised here?

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Information Sharing Challenges at Work

15. When there are differences of views about the best way to do things, what usually happens/how is it resolved:

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- There is open discussion and the best idea is agreed & acted on by the group
  Almost never.........Sometimes..............Frequently
Knowledge Generation and Sharing

- The manager makes the final decision
  Almost never……..Sometimes…………..Frequently

- The idea of the person seen as the “expert” usually acted on
  Almost never……..Sometimes…………..Frequently

Support for professional development

16. What support and encouragement is available from the organisation for further studies or qualifications eg formal courses at university or similar?

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17. How is knowledge gained on the job valued compared with other qualifications (such as certificates or degrees) and why?

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18. When someone is applying for a job or for a promotion, which would be more highly regarded?

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19. Under what circumstances would the organisation ask someone to do an outside course or qualification as a requirement for their position or for a promotion?

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20. What sort of formal recognition happens when someone moves to a more senior position?

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Loss of Knowledge and Knowledge leakage

21. Last time we met, we spoke about someone in your area who is especially valuable because of what they know or can do. Now I’d like you to think about what would be the
consequences of losing that person’s or indeed anyone’s special knowledge or skills if they left?

___________________________________________________________________________
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___________________________________________________________________________

22. What happened last time someone like that left (through retirement or resignation): was anything special done to try to capture or pass on their knowledge or skills? (e.g. getting them to brief others, using them as a coach, getting them to put on file all their “tricks of the trade”)?

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23. What do you think should be done to improve knowledge sharing in that situation?

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24. There have been a number of organisational changes recently. What impact have these changes had on your own area and the work of your area?

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25. What impact have these changes had on the knowledge and expertise of this area?

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26. What impact have the changes had on you and your role?

____________________________________________________________________________

27. What’s your reaction to the increased use of external consultants?
27.1. Can you see any advantages?

__________________________

__________________________

27.2. Can you see any disadvantages?

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28. What are the implications for knowledge sharing of outsourcing this area’s tasks rather than recruiting more staff?

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29. What would be the consequences of losing your area’s special knowledge and expertise?

29.1. For the organisation?

__________________________

__________________________

29.2. For you and the work you do?

__________________________

__________________________

30. If someone is really committed here, what do they do compared with someone who is not so committed?

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__________________________
31. Are there any other issues about knowledge sharing that you think are relevant to this research that you would like to comment on?

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Thank you for your participation.
Appendix 5

Schedule of Interview Questions: trainees
Schedule of Interview Questions - Trainees

Interviewee: ___________________________ Date: ______________________

Job title: ___________________________ Program: ______________________
Section: ____________________________

Explanation of purposes of this interview:
Gathering information about (i) you, (ii) your workplace, and (iii) the sharing of information in the workplace.

About You:

1. How long have you been with TransportServices?

2. How long have you been on your training program?

3. How long have you been in this section?

4. What other areas have you been placed in during your training program?

5. What is the highest level of education you completed?
   a) TAFE Certificate ……… Level: ………………… Completed: ……… Year: ………
   b) Degree: ………………………………………..Completed:……… Year: ………
   c) Master’s Degree: ……………………………………Completed: ……… Year: ………

6. What did you do before this job? (Could you please provide a brief personal history of your work background leading up to this job?)
About the your work

7. What is the overall purpose of this organisation?

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___________________________________________________________________________
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8. What is the purpose of this area/workgroup?

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9. What is the most demanding aspect of your work? Why?

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10. What do you find most fulfilling & why?

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Information flows

11. How do you usually find out what’s going on around here?

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12. What are the kinds of everyday information that are usually shared in this workplace?

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13. What information usually guides you on a day to day basis?

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14. How do you get hold of information you need to complete day to day tasks

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15. Who decides what information goes to particular areas or people:
16. Who decides what information comes to you?

17. Tell me about a situation you remember when you felt unsure about what to do – what happened?

18. Is there any information you need but don’t have ready access to?

19. By what means do you receive most information?

20. What are the sort of things you have been inducted into and how?

21. What do you need to know to become fully functional in your role?

**Knowledge sharing**

22. Thinking about people you believe are expert:
   a) In what ways are they free with their knowledge – do they readily share it with others or would you say they use it to create a reputation?
b) On what basis would they decide to share or not share their knowledge?

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c) Have you experienced or observed a situation where someone has held back from fully sharing their expertise because they didn’t really hold the other person in high regard? What happened?

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Newcomers and experienced hands

23. In what ways do more experienced workers support less experienced workers here?

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24. Can you give an example where an experienced person helped a new person by giving them access to more advanced work?

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25. Do you know of any situations where someone’s progress has been slowed through not getting access to more advanced work?

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Tensions between newcomers and experienced hands

26. Can you recall any situations where there were tensions between experienced hands and newcomers about how things should be done? What happened?

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___________________________________________________________________________
27. When there are differences of views about the best way to do things, what usually happens/how is it resolved?

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___________________________________________________________________________

Organisational citizenship behaviour

28. In your opinion, if someone is really committed what do they do compared with someone who is not so committed?

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Valuing knowledge gained on the job

29. How is knowledge gained on the job valued compared with other qualifications such as certificates and degrees?

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30. Are there any other issues about knowledge sharing that you think are relevant to this research that you would like to comment on?

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Thank you for your participation
Appendix 6

Final Interview Schedule of Questions: Senior manager
Final Interview with Senior Manager

Interviewee ID: __________RES0403__________________ Date: __________

Current title: ___________________________________________________________

Section Name: ___________________________________________________________

Welcome and introduction to the purpose of the interview:
Gathering information about: the organisation, how knowledge and expertise are built, communication between newcomers and experienced workers and retaining knowledge in the organisation.

A. Innovation

Last time we met, you told me about how new ideas are recognised through the recognition and reward system. I’d like to ask you further questions about innovation within your responsibility area and in the organisation more generally

1. The business strategy has changed and sharpened its focus in recent years. Who prompted the change?

<table>
<thead>
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<th></th>
<th>New management</th>
<th>Yes</th>
<th>No</th>
<th>Partly</th>
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<td>Competitors</td>
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<tr>
<td>1</td>
<td>Consultants</td>
<td></td>
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</table>
2. Can you tell me how that came about – what prompted the change eg

| Analysis of business environment – more complex/less complex; opportunities or challenges; competition; development of strategic alliances | Least important | Somewhat | Most important |
| Developments in the industry eg technological, new processes, seismic shifts in nature of service delivery | | | |
| government policy, internal analysis of current business strengths, weaknesses, decision to expand or contract business activities | | | |
| information from external sources eg operations in the industry elsewhere, identified needs | | | |
| Innovation: always interested in new ideas and new ways | | | |
| Analysis of business environment – more complex/less complex; opportunities or challenges; competition; development of strategic alliances | | | |

3. What will be the main measure of the effectiveness of this business change? E.g. Return on investment
Various profit margin measures
Increase in tonnage carried
Cash flow
Customer satisfaction measured by renewed contracts
Reliability measures
Other measures_________________________
4. Last time we met, you told me about changes to the structure and organisation of the larger grouping and your own area. Can you describe the changes that have resulted within your own responsibility area?

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5. In your opinion what are the advantages of the new structure?

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6. In your opinion, what are the disadvantages of the new structure?

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7. What impact have the changes had on you and your role?

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8. Do you now have more access to the key information needed to manage your business?

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9. Have you lost access to any information that you previously received? Yes / No

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10. If yes, What has been the impact of that on your ability to manage your responsibilities?
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11. Staff have been formed into different groupings - What has been the impact of the new arrangements on information and knowledge flows?
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12. In your opinion, what has been the reaction of staff to the new arrangements?
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Building knowledge and expertise

13. How will this area attract and recruit new engineers and drafters?
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14. I’d like you to think about an example of a new engineer or drafter joining the group straight after finishing their studies. How would you induct them?
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15. What do they need to know to become fully functional?
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16. How do they learn to become fully functional?

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**Information sharing and helping between ‘newcomers’ and ‘experienced workers’**

17. In what ways do more experienced workers support less experienced workers here?

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18. Can you think of an example?

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19. Do you know of a situation where someone’s situation has been slowed through not getting access to opportunities or more advanced work?

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20. Can you recall any situations where there were tensions between ‘experienced hands and ‘new comers’ about how things should be done? What happened?

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21. Thinking about people you believe are ‘expert’ here:
   20.1 In what ways are they ‘free’ with their knowledge? Do they readily share it with others or would you say they use it to create a position of influence?

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20.2 On what basis would they decide to share or not share their knowledge?

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22. Can you recall a situation where someone has used their particular knowledge to gain a reputation as an expert, to gain a promotion or a position with another firm?

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About your knowledge sharing
   23. Can you give an example of how you shared your knowledge recently?

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24. On what basis do you share your knowledge?

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25. Can you think of a situation where you may have held back from fully sharing your expertise with a co-worker because you didn’t really hold them in high regard?

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26. Is there someone in particular with whom you usually share your new ideas or suggestions? Why is that?
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27. When there are differences of views about the best way to do things, what usually happens:
   - There is open discussion and the best idea is agreed & acted on by the group
     Almost never……….Sometimes………….Frequently
   - The manager makes the final decision
     Almost never……….Sometimes………….Frequently
   - The idea of the person seen as the “expert” usually acted on
     Almost never……….Sometimes………….Frequently

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28. How is knowledge gained on the job valued compared with other qualifications (such as certificates or degrees) and why?
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29. When someone is applying for a job or for a promotion, which would be more highly regarded?
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How are special knowledge or expertise usually recognised around here?
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Loss of Knowledge and Knowledge leakage

30. Last time we met, we spoke about someone in your area who is especially valuable because of what they know or can do. Now I’d like you to think about what would be the consequences of losing that person’s or indeed anyone’s special knowledge or skills if they left?

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31. What happened last time someone like that left (through retirement or resignation): was anything special done to try to capture or pass on their knowledge or skills? (e.g. getting them to brief others, using them as a coach, getting them to put on file all their “tricks of the trade”)?

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32. What do you think should be done to improve knowledge sharing in that situation?

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33. What’s your reaction to the increased use of external consultants?

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33.1 Can you see any advantages?

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33.2 Can you see any disadvantages?
34. What are the implications for knowledge sharing of outsourcing this area’s tasks rather than recruiting more staff?

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35. What would be the consequences of losing your area’s special knowledge and expertise
35.1 For the organisation?

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35.2 For you and the work you do?

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36. If someone is really committed here, what do they do compared with someone who is not so committed?

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37. Do you believe further changes are required to finetune the new structure?

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38. Are there any other issues about knowledge sharing that you think are relevant to this research that you would like to comment on?

Thank you for your participation.
Appendix 7

*Level One data analysis codes*
<table>
<thead>
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<th>First round interviews</th>
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<th>Third round interviews</th>
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<td>Recent changes in business strategy</td>
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<td>Induction &amp; socialisation</td>
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<td>Drivers for change in business strategy</td>
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<td>To be fully functional</td>
<td>Socially situated practice site &amp; work group</td>
<td>Measures of business strategy change</td>
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<td>Seeking information in my area</td>
<td>Control mechanisms &amp; communication</td>
<td>Socially situated practice site &amp; KS</td>
<td>General impact of organisational changes</td>
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<td>Re-identification of most important key performance indicators</td>
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<td>Example of KS not working well</td>
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<td>Outcomes of re-focusing &amp; better information</td>
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<td>Sharing my new ideas</td>
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<td>My guiding information</td>
<td>Impact of organisational changes on KS</td>
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<td>Organising principles &amp; control mechanisms</td>
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<td>Gathering information</td>
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<td>KS &amp; political behaviour</td>
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<td>Example of KS working well</td>
<td>KS about knowledge generation</td>
<td>My KS behaviour</td>
<td>What I need to know to be fully functional</td>
<td>Progress to more complex work</td>
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<td>Basis of expert workers’ KS behaviour</td>
<td>Socially situated practice site &amp; KS</td>
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<td>Recognition of individual expertise</td>
<td>KS with novices</td>
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<td>Socially situated practice support for novices</td>
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<td>Example of valuable others’ KS behaviour</td>
<td>Valuing experience vs. qualifications</td>
<td>Progress to more complex work</td>
<td>Contested workplace relations</td>
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<td>Importance of knowing how to get the system to work for you</td>
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<td>Formal recognition of promotion</td>
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<td>Valuing experience vs. qualifications for promotion</td>
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<td>Consequences of losing this area’s special knowledge</td>
<td>Valuing experience vs. qualifications</td>
<td>Knowledge leakage</td>
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<td>Attracting new staff into this area</td>
<td>Length of service &amp; background</td>
<td>Preventing knowledge leakage</td>
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<td>Public sector</td>
<td>My suggestions for preventing knowledge leakage</td>
<td>Intergenerational relations</td>
<td>Consequences of losing this area’s special knowledge</td>
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<td>Discretion to innovate</td>
<td>General impact of organisational changes</td>
<td>Perceptions of commitment &amp; OCB</td>
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<td>Adoption of my ideas</td>
<td>Impact of org. changes on me</td>
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<td>Organising principles &amp; control mechanisms</td>
<td></td>
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<td>Pressure of work</td>
<td>Impact of org changes on KS</td>
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<td>Socially situated practice sites &amp; KS</td>
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<td>Ways to increase KS</td>
<td>Perceptions of commitment &amp; OCB</td>
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<td>Pressure of work</td>
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<td>Specialised nature of rail knowledge</td>
<td>KS problems</td>
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<td>Situated practice &amp; work group</td>
<td>Values</td>
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<td>Impact of outsourcing &amp; consultant use</td>
<td>My reaction to increased use</td>
<td></td>
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</table>
Knowledge Generation and Sharing

Problems with consultants
Implications of increasing outsourcing
Affective commitment
Appendix 8

Examples of relationships between Level One data analysis codes and Level Two sub-categories
### Examples of relationships between Level One data analysis codes and Level Two sub-categories

<table>
<thead>
<tr>
<th><strong>Level Two sub-categories</strong></th>
<th><strong>Level One codes</strong></th>
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</table>
| **Knowledge sharing**                                                                          | First round interviews: Example of KS working well; socially constructed practice knowledge sharing; Example of KS not working well; Kinds of information shared  

Second round interviews: Accessing information; Seeking information in my area; Seeking information outside the organisation; Seeking information in other areas; Information access permission; Sharing my new ideas; socially constructed practice and KS; KS about knowledge generation; My KS behaviour; KS with other areas; My important issues; Guiding information; Increasing KS  

Third round interviews: Most effective KS practice; Induction and socialisation; socially constructed practice and KS; Progress to more complex work; Expert workers’ KS behaviour; Lack of access to more advanced work; KS and political behaviour; My KS behaviour; Example of my KS behaviour; Contested workplace relations and KS; Impact of organisational changes on KS; Impact of outsourcing/consultants; My reaction to increased use of consultants; Implications of increasing outsourcing  

Trainee interviews: My induction and socialisation; socially constructed practice and KS; Accessing information; Information access permission; Expert workers’ KS behaviour; Contested workplace relations and KS; KS with novices; OCB and KS; Example of accessing information; Example of progress to more complex work; Example of lack of access to more advanced work  

Senior Manager interview: Re-identification of most important KPIs; Outcomes of re-focusing and better information; Impact of organisational changes on KS; Implications of outsourcing for KS; Induction and socialisation; Progress to more complex work; Lack of access to more advanced work; socially constructed practice and KS; Induction and socialisation of new supervisors; KS and political behaviour; socially constructed practice and KS |
| **Contested workplace relations**                                                              | First round interviews: N/A  

Second round interviews: Gatekeepers; Contested workplace relations  

Third round interviews: Contested workplace relations between experienced workers and novices; Example of contested workplace relations between experienced worker and novice; Contested workplace relations and KS; Contested workplace relations; Lack of access to more advanced work  

Trainee interviews: Lack of access to more advanced work; Gatekeepers; Basis of experts’ KS behaviour; Contested workplace relations; Contested workplace relations and KS; Progress to more complex work; Example of KS working well; Contested workplace relations between experienced workers and novices; Generation gap. |
| Knowledgeable others | First round interviews: N/A  
Second round interviews: Knowledgeable/valuable others; Example of valuable others’ KS behaviour; Increasing KS  
Third round interviews: Expert workers’ KS behaviour; Knowledge leakage; Example of knowledge leakage; Example of this area’s special knowledge; Preventing knowledge leakage; My suggestions for preventing knowledge leakage  
Trainee interviews: Expert workers’ KS behaviour; Basis of expert workers’ KS behaviour  
Senior Manager interview: Knowledge leakage; Preventing knowledge leakage; My suggestions for preventing knowledge leakage |
| Knowledge generation and innovation | First round interviews: N/A  
Second round interviews: Sharing my new ideas; Example of innovation; KS about knowledge generation; Rewards for innovation; Discretion to innovate; Adoption of my ideas  
Third round interviews: Sharing my new ideas; Recognition of individual expertise; Consequences of losing this area’s special knowledge; Example of this area’s special knowledge  
Trainee interviews: N/A  
Senior Manager interview: Management information outcomes of new structure; Outcomes of re-focusing and better information; Recognition of individual expertise; Consequences of losing this area’s special knowledge |
| Socially constructed practice sites | First round interviews: socially constructed practice and work group; socially constructed practice knowledge sharing; Example of KS not working well; Gathering information; Example of KS working well, Example of KS not working well; Kinds of information shared; Workers’ characteristics  
Second round interviews: Sharing my new ideas; socially constructed practice and KS; KS with other areas; Adoption of my ideas  
Third round interviews: Induction and socialisation; To be fully functional; Control mechanisms and communication; socially constructed practice and KS; Progress to more complex work; Expert workers’ KS behaviour; Lack of access to more advanced work; KS and political behaviour; Contested workplace relations and KS; Recognition of individual expertise; Valuing of experience vs qualifications; Valuing of experience vs qualifications for promotion; Perceptions of commitment and OCB; socially constructed practice and work group; Example of |
| Knowledge leakage | First round interviews: N/A  
Second round interviews: Knowledge leakage; Increasing KS  
Third round interviews: Knowledge leakage; Consequences of losing this area’s special knowledge; Impact of outsourcing/consultants; My suggestions for preventing knowledge leakage; Example of knowledge leakage; Preventing knowledge leakage; Implications of increasing outsourcing  
Trainee interviews: N/A  
Senior Manager interview: Knowledge leakage; Preventing knowledge leakage; My suggestions for preventing knowledge leakage; Consequences of losing this area’s special knowledge |

Trainee interviews: Mt induction and socialisation; socially constructed practice and work group; Accessing information; socially constructed practice and KS; What I need to know to be fully functional; Expert workers’ KS behaviour; Basis of experts’ KS behaviour; KS with novices; socially constructed practice site support for novices; Progress to more complex work; Example of KS working well; Lack of access to more advanced work; Contested workplace relations; Contested workplace relations between experienced workers and novices; OCB and KS; Valuing experience vs qualifications; Example of accessing information; Example of progress to more complex work; Example of lack of access to more advanced work; Perceptions of commitment and OCB

Senior Manager interview: General impact of organisational changes; Re-identification of most important KPIs; Impact of organisational changes on KS; Implications of increasing outsourcing; Induction and socialisation; To be fully functional; Progress to more complex work; Lack of access to more advanced work; socially constructed practice and KS; Induction and socialisation of new supervisors; Contested workplace relations between experienced workers and novices; KS and political behaviour; Contested workplace relations and KS; Contested workplace relations; Valuing experience vs qualifications; Valuing experience vs qualifications for promotion; Recognition of individual expertise; Perceptions of commitment and OCB; socially constructed practice and KS
Appendix 9

Participant Briefing and Informed Consent Form
The Mediating Effects of Relational Factors on Knowledge Sharing in Organisations

INFORMED CONSENT FORM

Purpose of This Project:

The purpose of this research project is to collect data which will assist in developing new understanding about how knowledge is shared in organisations. Your input is needed to develop our understanding in this area. The study explores what influences people’s knowledge sharing behaviour in organisations, the value placed on people’s “know how,” how people share what they know in the workplace, and how those ideas become part of what the organisation knows. The research will help the design of more effective approaches to developing and enhancing knowledge sharing at work, particularly where work entails complex problem-solving in a competitive environment, dealing with exceptions or innovative responses. That information will help in continuous improvement in competitiveness in the marketplace and the development of a multi-skilled organisation able to make the most of the knowledge within the organisation, now and in the future.

What's Involved:

As a participant in this project, you will be asked to be involved as follows:

Each participant would take part in one-on-one interviews with the researcher. Three confidential interviews will be conducted with each person. Each interview will last about forty-five minutes to one hour, and the interviews will be held at mutually agreeable times and dates.

The interview questions will cover the ways the organisation recognises members' knowledge and expertise; how knowledge and skill development are fostered; organisational factors which affect knowledge flow; and influences on the ways individuals share what they know. For ease of gathering and analysing this information, these interviews will be recorded on audio-cassettes. In some instances the information on the cassettes will be made into typed transcripts which will be provided to you for comment at subsequent interviews.

Relevant organisation procedures manuals and/or publications may also be reviewed to identify any policies or procedures which apply specifically to this topic.

How Your Interests Will Be Protected

Informed consent is required for your participation in the research project. This consent extends to the information provided by you to be used in the project. Confidentiality will be maintained at all times. Only the researcher will have access to the information you provide. A pseudonym (substitute name) will be assigned to the information you provide that will hide the identity of its source. No identifiable information will be left in the workplace once it has been gathered from you. You will retain the right for any data not to be published in any identifiable form. Extracts from the interviews and survey may be made part of the final research report, but you will not be named, and any features which might identify you will not be included in the report.

It is important that you feel free to participate in the research project without fear or favour. Your have the right to contact the Researcher about any aspect of your involvement. You are free to not answer any question, you may withdraw at any time, and there will be no penalty or loss of benefits should you refuse to participate or decide to discontinue your participation.
However given the efforts taken by the researcher to maintain your anonymity and treat any information in confidence it is not anticipated that you will be in any way discomforted by the research project or put at risk by it. In most situations, participants engaged in this kind of project find them to be rich learning experiences. You will be given a copy of this information to keep. At the end of the project you will be provided with information about the research outcomes.

**Where Can You Get More Information?**

Contact the researcher: Ms Claire Gardiner, phone (07) 3864 5319 (bus) or email c.gardiner@qut.edu.au. The project’s Principal Supervisor is Associate Professor Stephen Billett, School of Arts, Vocational and Technology Education, Griffith University.

**Complaints**

Complaints concerning the manner in which a research project is conducted may be given to the Researcher as above, or the project’s Principal Supervisor, Associate Professor Stephen Billett, School of Vocational, Technology and Arts Education, Faculty of Education, Griffith University, 4111, phone (07) 3875 5855.

If an independent person is preferred, either the university’s Research Ethics Research Officer, Office for Research, Bray Centre, Griffith University, Kessels Road, Nathan, Qld 4111 (phone (07) 3875 6618) or the Pro Vice-Chancellor (Administration), Bray Centre, Griffith University, Kessels Road, Nathan, Qld 4111 (phone (07) 3875 7343) can be contacted.
Consent Form:

Research Project: The Mediating Effects of Relational Factors on Knowledge Sharing in Organisations
Researcher: Claire Gardiner

To satisfy the requirements of its ethics processes it is necessary that you give consent to the following statement.

I, ................................................................., agree to participate in The Mediating Effects of Relational Factors on Knowledge Sharing in Organisations project and give my consent freely. I have read and understand the information provided, a copy of which I have retained. I understand that my participation is voluntary and will not affect my treatment in the workplace or by the researcher. I realise that I can withdraw from the project at any time and that I do not have to give any reasons for withdrawing. I have had all questions answered to my satisfaction.

Investigator: _____________________________ Date: ____________
Participant: _____________________________ Date: ____________

Griffith University and the researcher gratefully acknowledge your assistance with this project.
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