

Implementation of knowledge protection strategies by SMEs: an Australian case study

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Abstract

The purpose of this study was to develop and refine a theoretical framework to identify the factors that influence the use of knowledge protection (KP) strategies by small and medium sized enterprises (SMEs). Knowledge is generally defined as information with context, and is one of the most important assets of an organisation. KP refers to the efforts made by an organisation to prevent knowledge from being altered or lost. In particular, SMEs depend on knowledge sharing and collaboration with business partners and suppliers, which makes knowledge protection even more critical. However, their smaller size makes its use more challenging. One reason for this is that the tools required for knowledge protection are often limited and costly. This study thus addresses the following research questions:

- To what extent do SMEs adopt knowledge protection strategies?
- What factors enable or inhibit SMEs when adopting knowledge protection strategies?
- What strategies, if any, do SMEs use to protect their knowledge?
- What benefits do SMEs receive from implementing knowledge protection strategies?

The research was conducted using an interpretivist approach with a case study methodology. In-depth, semi-structured face to face interviews were conducted with the owner/managers, managers and/or directors of 20 Australian SMEs. Data was collected across different areas of Australia and across four industry sectors. The data was analysed using the qualitative analytic approach of themed analysis and was guided by Resourced-Based View (RBV) theory

From a practical viewpoint, the research helped to identify the factors that influence the KP strategies implemented by SMEs. This occurred initially through the development of the study's theoretical framework. The findings revealed that most SMEs relied heavily on informal and semi-formal KP strategies such as restricted access to documents, due to their limited resources. Only a small number of SMEs used formal strategies such as patents. Factors influencing KP adoption were categorised into two broad groups: SME-specific factors (business size, owner/manager characteristics, flexibility, and relationships) and organisational/contextual factors (industry sector, geographic location).

The study also found that while businesses did not formally assess the benefits of KP, they perceived improvements in client trust, operational consistency, and competitive positioning. The theoretical framework was refined to incorporate new dimensions such as business growth (in addition to age), intra- and inter-organisational relationships, and contextual market conditions alongside infrastructure availability.

The study offers important insights from both organizational and managerial perspectives. Theoretically, it contributes to RBV theory by developing and refining a framework that explores how SMEs implement KP strategies based on their structure and nature. Although the topic of KP is relatively new in the context of SMEs, the research highlights how these firms leverage internal resources, particularly human and relational capital, to develop informal, adaptable protection mechanisms. Despite often lacking the capacity for formal protection, SMEs can effectively safeguard their knowledge using resource-conscious strategies. This study thus provides a useful framework for SMEs to assess, adopt, and scale their knowledge protection efforts.

Declaration of Authenticity

“I, Mandeep Dhindsa, declare that the Doctor of Philosophy thesis entitled Implementation of Knowledge protection strategies by SMEs: an Australian case study is no more than 80,000 words in length including quotes and exclusive of tables, figures, appendices, bibliography, references and footnotes. This thesis contains no material that has been submitted previously, in whole or in part, for the award of any other academic degree or diploma. Except where otherwise indicated, this thesis is my own work”.

“I have conducted my research in alignment with the Australian Code for the Responsible Conduct of Research and Victoria University’s Higher Degree by Research Policy and Procedures.

This thesis has been edited for clarity of expression, punctuation and grammar using Chat GPT tool. This use complies with VU guidelines on use of editors in HDR theses and overall VU policy on use of AI in research.”

Ethics Declaration

“All research procedures reported in the thesis were approved by the Higher research degree Victoria University’s Ethics Committee (HRE18-108).

Signature:

Date: 13th Aug, 2025

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Chapter One: Introduction

1.1. Purpose of the study

The purpose of this study was to develop and refine a theoretical framework to identify the factors that influence the use of knowledge protection strategies by small and medium sized enterprises (SMEs). Knowledge is “information combined with experience, context, interpretation, and reflection. It is a high value form of information that is ready to apply to decisions and actions” (Albert and Bradley, 1997, pp- 67) and is one of the most important assets of an organisation (Jarrar, Schiuma & Zairi 2015). Knowledge protection (KP) refers to the efforts made by an organisation to prevent knowledge "from being altered, transferred to other organizations, lost, or becoming obsolete" (Bloodgood & Salisbury 2001, p 57).

In particular, SMEs can depend on knowledge sharing and collaboration with business partners and suppliers, which makes KP even more critical. However, their smaller size makes its use more challenging (Estrada, Faems & Faria 2015). One reason for this is that the tools required for KP are often limited and costly (Päällysaho & Kuusisto 2011).

The research has used an interpretivist approach with a case study methodology to address the research questions. Semi-structured face to face interviews were conducted with either the owner/managers or directors of participating businesses. Note that this study was completed in two parts, as per the requirements of Victoria University’s Doctor of Philosophy (Integrated) program. This program requires students to complete a minor thesis before progressing to a regular PhD program. A single project theme operates across both theses and data collection from the minor thesis can be used as part of the data collection for the PhD program. The resultant PhD is examined as per any other completed PhD^[OBJ]. A total of 20 interviews were conducted for this study. Ten interviews across three industry sectors were carried out between 2017 and 2018 and were submitted as part of the minor thesis for the PhD Integrated First Year, which was completed over two years on a part-time basis. The remaining 10 interviews were conducted from 2019 to 2025. Due to the occurrence of the COVID-19 pandemic during this period, several previously interviewed businesses were revisited to follow up on the impact of the pandemic on the adoption of KP strategies in those businesses.

Data was analysed using the qualitative analytic approach of thematic analysis. This allowed the researcher to focus on the gathered data in numerous ways. For example, by reporting participants’ experiences and realities, or by exploring how these experiences, realities and events influenced the range of discourses happening within society (Braun & Clarke, 2006).

From a practical viewpoint, the study identified the factors that influenced the KP strategies implemented by SMEs. The outcomes of the study had significant implications from both organisational and managerial perspectives. The study focused on investigating KP strategies and determined what KP strategies SMEs had in place. From a theoretical viewpoint, the research developed and refined a theoretical framework to explore the implementation of KP strategies based on organisational structure and nature. As knowledge protection was a relatively new topic in the literature, particularly in the SME context, this study provided important insights into the adoption and use of KP strategies.

1.2. Aims of the Project

The research aimed to develop and refine a theoretical framework to identify the factors that influenced the use of KP strategies by SMEs. KP assists an organisation to sustain competitive advantage, as well as protect organisational knowledge from spill overs and leakages. Knowledge spill over is the exchange of knowledge among individuals and companies. Knowledge leakage is an unwanted knowledge transfer or deliberate or accidental loss of knowledge from an organisation to its competitors (Ahmad, Bosua & Scheepers 2014; Annansingh 2012). KP is mostly overlooked and neglected in SMEs even though knowledge is one of their most critical assets (Bolisani, Paiola & Scarso 2013).

To address this problem, the research has developed a theoretical framework based on the literature and then has refined it through empirical investigation. The framework examined the influence of organisational characteristics on the adoption of KP strategies by SMEs and the benefits they provided.

Specifically, the research explored the adoption of KP strategies by Australian SMEs by examining:

- the extent to which SMEs adopted KP strategies;
- the factors that enabled or inhibited SMEs from adopting KP strategies;
- the specific strategies used by SMEs to protect their knowledge; and
- the benefits received from implementing KP strategies.

1.3. Contribution to Knowledge and Statement of significance

1.3.1. Contribution to Knowledge

This study made both theoretical and practical contributions to the field of knowledge management and SME research. KP remains an under-researched area (Manhart & Thalmann 2015; Jennex & Olfman 2005), and this study shed light on the adoption and use

of KP strategies by SMEs through a theoretical framework developed from the literature and refined during the study. Prior research has demonstrated that KP practices vary considerably across industry types, organisational structures, managerial characteristics, and geographical contexts (e.g., Bolisani, Paiola & Scarso 2013; Olander, Laukkanen & Heilmann 2011; Contigiani & Testoni 2023). However, these studies often generalise findings across SMEs without fully acknowledging the heterogeneity that characterises this sector, particularly in terms of resource constraints, reliance on informal processes, and dependence on owner-managers' knowledge and decision-making styles. Accordingly, the conceptual foundations of KP within SMEs remain limited, with little integration of the multiple contextual factors that shape protection practices. This study contributes to theory by developing a more holistic and context-sensitive understanding of KP for SMEs, capturing the interplay between organisational size, managerial capabilities, industry dynamics, relational dependencies, and environmental pressures.

A further theoretical contribution arises from recognising the limitations of applying international findings directly to the Australian SME environment. Most existing literature originates from Europe, North America, or Asia, where innovation systems, IP regulations, institutional support, organisational structures, and industry compositions differ markedly from those found in Australia. For example, Finnish studies emphasise HR-driven KP approaches that rely on structured processes not commonly found in Australian SMEs, which often lack formal HR systems (Olander, Laukkanen & Heilmann 2011). European manufacturing-focused research highlights patent use as a central protection mechanism (Cohen, Nelson & Walsh, 2000), yet many Australian SMEs predominantly operate in service and trade sectors where patents are less relevant or feasible. Studies emphasising the complexity of ICT infrastructures assume higher levels of technological sophistication (Koberg 2003) than commonly observed in Australian SMEs, especially in rural and regional settings where digital capability varies significantly. Geographical isolation identified as a barrier to knowledge flows in international research is even more pronounced in Australia due to its dispersed population and reliance on local networks for innovation. Consequently, prior findings cannot be assumed to apply directly to Australian SMEs. This study therefore provides an important theoretical advancement by contextualising KP within Australia's unique business landscape, demonstrating how local conditions shape the adoption, challenges, and outcomes of KP strategies.

In practical terms, the study offers valuable insights into the real-world challenges faced by Australian SMEs when implementing KP. The findings highlight that SMEs frequently rely on informal protection mechanisms because they are easier to implement, less resource-intensive, and better aligned with the flexible and adaptive nature of small business structures

yet such mechanisms also require continuous updating and oversight. Through these theoretical and practical contributions, the study improves understanding of knowledge protection and establishes a foundation for future research that more accurately reflects the needs and realities of SMEs operating in diverse and resource-constrained environments.

1.3.2. Statement of significance

This study provided a deeper understanding of how SMEs adopted and implemented KP strategies. The outcomes had important implications for SME organisational and managerial practices, especially since many SMEs were not fully aware of the benefits that KP could offer. The study included SMEs from diverse industry sectors, geographic locations, and sizes, thereby enhancing the understanding of KP strategies across different categories. The study's outcomes provided practical implications for SME managers and decision-makers, guiding them in the identification, customization, and deployment of KP strategies that are both cost-effective and context-appropriate.

1.4. Thesis Organisation

The thesis is organised into separate, consecutive chapters as follows. Chapter One provides the Introduction to the Study by outlining the background, research problem, objectives, research questions, and the overall significance of the study. Chapter Two presents a thorough review of the relevant literature, examining existing theories, frameworks, and empirical studies related to the research topic. This review identifies gaps in the current body of knowledge and provides the justification for the undertaken research. Chapter Three describes the methodology employed in the study, including the research design, data collection methods, sampling procedures, ethical considerations, and analytical techniques. It justifies the choice of methods and demonstrates how they align with the research aims. Chapter Four reports the results derived from the data collected through interviews, highlighting key themes and patterns that emerged during the analysis. These findings are presented with supporting evidence and contextualised within the participants' responses. Chapter Five provides a detailed analysis and interpretation of the data, linking the results to the literature reviewed earlier and discussing their implications using the selected analysis technique. The thesis concludes with a summary of the main insights, outlines the contributions of the study to the field, acknowledges its limitations, and offers suggestions for future research. A comprehensive list of references follows, documenting all sources cited throughout the work.

Chapter Two: Literature review

2.1. Literature search strategy

To make sure the literature review was done in a careful and organised way, a simple but systematic search strategy was used. The researcher first identified the main ideas of the study, which were knowledge protection, knowledge management, and small and medium-sized enterprises (SMEs) in Australia. From these ideas, a list of key search terms was created, such as “knowledge protection,” “knowledge leakage,” “knowledge management,” “SMEs,” “Australian business,” and “small business.” Different combinations of these terms were used during the search. Basic Boolean operators like AND and OR were applied to link terms together, for example: “knowledge protection AND SMEs AND Australia.” This helped make the search results more accurate and relevant.

The search was carried out mainly using Google Scholar and the university library’s online databases. Google Scholar was used first because it gives a broad overview of what research already exists. It is easy for beginners to use because results can be sorted by relevance or by the number of times an article has been cited. Features like “Cited by” and “Related articles” were used to find newer studies and similar research.

After Google Scholar, a more detailed search was done using the university library databases, such as EBSCOhost, ProQuest and ScienceDirect. These databases allow more advanced search options, including filters for peer-reviewed articles, subject areas, and full-text access. This helped the researcher find high-quality academic sources that may not appear in Google Scholar. All useful articles were saved and organised by renaming to keep track of the content and the sources.

Clear rules were used to decide which studies to include. The screening process happened in two steps. First, titles and abstracts were checked to remove sources that were not relevant. Then, full texts were read to decide whether the studies matched the goals of the research. These studies helped identify the main themes in the field, such as risks of losing knowledge, ways organisations try to protect knowledge, and the challenges that SMEs face. They also helped show what research is still missing, especially regarding knowledge protection in Australian SMEs.

2.2. Introduction

As the study focused on the adoption of knowledge protection strategies by Australian SMEs, it is first essential to define key terms such as knowledge, knowledge management, knowledge protection, and SMEs, as well as to clarify the rationale for concentrating specifically on SMEs. Accordingly, the chapter begins by establishing foundational concepts,

including data, information, knowledge, and wisdom, followed by a discussion of knowledge management and a narrowing of focus to KP, one of the six core processes within knowledge management (KM).

To contextualize the role of KP, this chapter provides an overview of all six KM processes, thereby highlighting the relevance and positioning of KP within this framework. The concept of KP is then explored in depth, including an explanation of the three primary types of KP strategies: formal, semi-formal, and informal.

Given the focus on SMEs, and the fact that definitions of SMEs vary internationally, the chapter explores definitions of SMEs. Before delving into the literature review on the implementation of KP strategies by SMEs, brief discussion occurs on related practices associated with KP. This is followed by an analysis of previous research in the field, examining the extent to which such strategies have been adopted and the specific practices employed by SMEs, thereby justifying the relevance and necessity of this research.

Finally, the research questions and the conceptual framework underpinning the study are presented, forming the foundation for the subsequent analysis.

2.3. Definitions

2.3.1. Data, Information and Knowledge

To understand knowledge, this section examines the relationship between data, information, knowledge, and wisdom.

2.3.1.1. Data

Data can be described as facts or statistics collected for the purpose of reference or analysis (2019). Another description of data is that it is “recorded facts and figures” (Kroenke, Bunker and Wilson 2012, p.27). By itself, data is a series of disconnected facts and observations which have not been processed for use. This means that no effort has been made to organize the data in a manner that would give it some meaning (Stonier 1997). For instance, Kroenke et al (2012) suggest that the number ‘17.5’ by itself has no particular meaning and can thus be described as data. However, if is placed in the context of how many dollars an employee earns (e.g. \$17.50 per hour) then it goes beyond being data (as it has some meaning). Other terms used to describe data are ‘raw data’ or ‘atomic data’ (Sowell 1996).

2.3.1.2. Information

Information refers to data that have been processed, interpreted, and contextualized in a manner that provides meaning and reduces uncertainty for an individual or system. It serves as a basis for communication, decision-making, and knowledge creation. (Shannon &

Weaver, 1949; Davenport & Prusak, 1998). It can also be defined as data along with a context, which has some meaning (Stonier 1997). When data is organized, analyzed, cross-referenced, interpreted and/or summarized it is converted into information (Dreyfus 2001). Again, referring to the previous example of \$17.50 per hour, when this value is placed in the context of payrate of an employee then it started conveying a message that these are the dollars earned per hour by an employee. Hence, is now converted into information from data.

2.3.1.3. Knowledge

Knowledge is defined as the “information processed by individuals including ideas, facts, expertise, and judgment relevant for individual, team, and organisational performance. (Wang & Noe 2010, p117)”. Albert and Bradley (1997, p-57) defined knowledge as a “high value form of information that is ready to be applied to decisions and actions.” Knowledge is achieved when humans do not just view information as a description of facts but can also understand how to use it to achieve their goals (Annansingh 2012). Knowledge is not just a simple aggregation of information but rather it is information combined with experience, context, interpretation and reflection (Zins 2007). Knowledge can be embedded into documents, policies, processes, practices and routines (Omotayo 2015). Another very comprehensive definition of knowledge is provided by Davenport and Prusak (1998, p-5): “Knowledge is the pool of recorded experiences, values, information related to organizational context and experts dealing with the situations, to become a benchmark for new experiences.” This thesis adopts Nonaka and Takeuchi’s (1995) definition of knowledge, which views knowledge as ‘a dynamic human process of justifying personal belief toward the truth.’ This definition highlights the role of human interpretation, context, and belief in the formation and use of knowledge.

Knowledge can be broadly categorised into explicit knowledge and tacit knowledge. Explicit knowledge is knowledge which is easy to present in tangible form (Nonaka & Takeuchi 1995). It is mostly documented in books, documents, reports and so forth. Information that is processed, documented, structured and/or interpreted is explicit knowledge. Explicit knowledge is easily articulated, communicated, recorded and in the world of knowledge management and protection, stored. Examples of explicit knowledge are business data sheets, company policy and procedure documents, instruction manuals, research reports and journal articles. For example, any new employee can access and read company policy documents or perform their job routines following an instruction manual. Explicit knowledge sometimes can also be termed as formal knowledge because it is found in formal business documents (Aranda 2018).

Tacit knowledge is the knowledge held by individuals in their 'mind' and relates to, perceptions, beliefs and behaviour. This type of knowledge is derived from skills, experience, judgement, intuition and insight. Tacit knowledge cannot easily be transferred from one person to another. It can generally only be shared through discussions, stories and verbal communication. Although sharing of tacit knowledge is possible, it still does not guarantee that the receiving person will acquire the knowledge (Nonaka & Takeuchi 1995). This difficulty of acquiring tacit knowledge is explained by Davenport and Prusak (1998) with an example of an attempt to transfer the skill of the world's best aerial photo analyst into an expert system by a computer scientist. The expert system failed to create the expert system but because of the great amount of time spent by the scientist with the expert in order to understand the expert's knowledge, the scientist ended up serving an apprenticeship with the expert. As a result, the scientist became the world's second-best analyser of aerial photographs.

A cooking recipe is another example of explicit knowledge as it has a list of ingredients in particular measures and a set of steps to be followed. However, only after cooking for several months or years will a cook learn the exact feel of the dough or exact time that prepared items should be in the oven or how to stir them. So, anything which is not written down but can be felt or learned over time is tacit knowledge (Edwards 2005).

Tacit knowledge is also termed as informal knowledge. Informal knowledge is generally the more important than explicit knowledge as these are the skills and knowledge developed by the employees. This knowledge is very difficult to protect and retain when employees leave company (Jarrar, Schiuma & Zairi 2015).

Both explicit and tacit knowledge need to be shared for organisational development (Wang & Noe 2010). Knowledge sharing is an activity to exchange knowledge through ideas, expertise, skills, and plans among peers, families, friends and organisations. Knowledge sharing helps in solving problems, developing new ideas and implementing policies and procedures (Wang & Noe 2010). Knowledge sharing has two types of activities, intra-firm and inter-firm (Yang & Wu 2008). Intra-firm knowledge sharing is performed within the organization, whereas inter-firm knowledge sharing occurs across different organisations (Yang & Wu 2008), for instance, to enhance competitive advantage through strategic partnerships. The formal nature of explicit knowledge has made it easier to manage (store, retrieve and share) with the use of ICT than tacit knowledge. However, recent studies (such as Castaneda & Touslon 2020) have found that ICT that can facilitate dialogue (such as videoconferencing) can assist people to share tacit knowledge.

2.3.2. Knowledge management

Within the context of organizational knowledge, knowledge management is a process to systematically manage an organization's knowledge assets with strategic initiatives, processes and strategies (Jarrar, Schiuma & Zairi 2015). According to García-Holgado et al. (2015) knowledge management processes comprise a series of steps, namely generation, sharing, storage, codification, application and protection (refer Figure 1).

In general, knowledge management is the process of continually managing all kinds of organisational knowledge to meet an organisation's existing and future needs (APQC 1997). The main aim of knowledge management is to maximize an organisation's knowledge resources (Jarrar, Schiuma & Zairi 2015), by facilitating the transfer of knowledge for the purposes (Alavi & Leidner 2001) and to achieve competitive advantage and economic value (Zack, 1999).

2.3.2.1. Stages of Knowledge Management

Knowledge generation is the set of processes to increase the level of an organisation's knowledge assets (Nonaka & Takeuchi 1995). Nonaka (1995) believes that knowledge acquisition and creation are the two sub-processes of knowledge generation. The process of absorbing and storing new information in memory is the first step in the knowledge management lifecycle and is known as *knowledge generation* (Nonaka & Takeuchi 1995).

The process of capturing and bringing external knowledge to an organisational context is called *knowledge acquisition*. The easiest and the direct way of acquiring external knowledge is by purchasing it. For example, buying patents, trademarks, and technologies. Renting or leasing knowledge could be another way, or by paying consultants to solve a problem (Marr, Schiuma & Neely 2000).

Knowledge creation is a process to develop new knowledge assets in the business (Jarrar, Schiuma & Zairi 2015). Jarrar (1025) believes that knowledge creation is a complex, multidimensional, and dynamic process. It is not just the creation of knowledge but also circulation of knowledge in the organisation, products, services and processes. It is the result of interpretation of information by employees of the organisation. Hence, it is dependent on individual learning processes (Jarrar, Schiuma & Zairi 2015). Nonaka (1995) believes that businesses who create and circulate knowledge consistently will always succeed.

The knowledge creation process is said to be multidimensional as it depends on various factors such as culture, organisation, knowledge sources and knowledge processes (Jarrar, Schiuma & Zairi 2015). Nonaka (2001) argued that knowledge creation is an iterative process. The process moves from tacit knowledge to explicit knowledge and back. First, tacit

knowledge is codified into explicit knowledge which is then read, used, and helped to develop new tacit knowledge (Nonaka 2001). Nonaka suggested that knowledge creation is an ongoing process where newly created knowledge is used for innovation and innovation is a source of competitive advantage. When organisations innovate, they not only process information acquired from outside but at the same time they create new knowledge to redefine their problems and solutions.

Knowledge sharing refers to the transfer and exchange of knowledge between firms, departments or individuals. Knowledge can be shared via different communication mediums like the spoken word or written text and can be transferred through participating in training courses, observation of other people in action and attending or participating in conferences (Allameh, Zare & Davoodi 2011). Gupta and Govindarjan (2000) equates knowledge sharing to knowledge flows. They argued that knowledge flows are comprised of five elements:

- the value of the sources' knowledge (where the source is any place, person or organisation that originates knowledge),
- the willingness of the source to share knowledge,
- the media richness of the communication channel (which refers to the communication medium's capability to carry rich information and reproduce the information sent over the channel,
- the willingness of the recipient to acquire knowledge where recipient is the person or organisation receiving the knowledge, and
- the absorbing capacity of the recipient, which means the ability of the recipient to absorb the information being transferred.

Knowledge sharing is also defined as set of behaviours that involve the exchange of information (Connelly and Kelloway 2003).

A number of factors have been identified that influence knowledge sharing. The factors are categorised into two types: hard issues and soft issues (Chennamaneni 2006). Hard issues include tools and technologies used to share knowledge, such as shared documents, databases and other collaborative tools (Chennamaneni 2006). Soft issues include motivations and provision of incentives to encourage knowledge sharing, for instance, organisation culture, national culture, incentives for sharing, personal values and resources like time, space and access to knowledgeable individuals (Chennamaneni 2006). Knowledge sharing is also known as knowledge exchange. Organisations believe that effective knowledge sharing encourages innovation, increases awareness about past experiences and affects quality of new products (Allameh, Zare & Davoodi 2011). Aulawi (2009) argued

that knowledge sharing stimulates individuals to think critically and creatively, which leads to the production of new knowledge.

Next, organisations need mechanisms and processes to store knowledge and retrieve it when needed (the *knowledge storage* step) (Alavi 2000). Organisational knowledge is stored in various forms, for example documents, electronic databases, documented policies and procedures and codified knowledge in expert systems (Bollinger & Smith 2001). The system used to store past organisation knowledge is termed as knowledge archiving (Walsh & Ungson 1991). It also includes individuals' knowledge gained over time with observation and experience, also via knowledge sharing and access to knowledge archives (Walsh & Ungson 1991). To enable future access to organisational knowledge, three processes which organisations should focus on are:

- identify knowledge related to events, processes and people which are worthy of storing,
- choose appropriate modes of storage, and
- keep stored knowledge up to date (Allameh, Zare & Davoodi 2011).

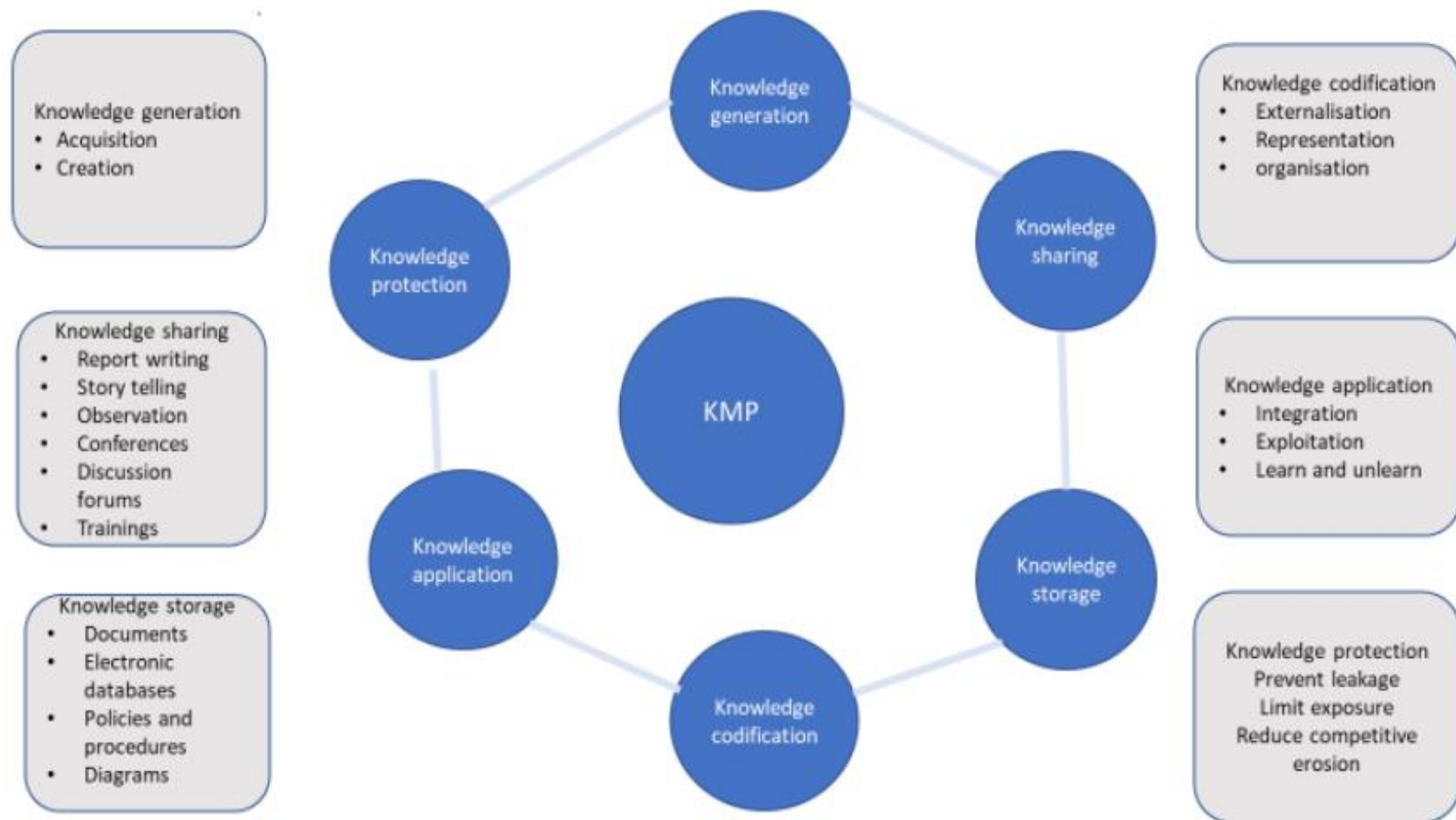


Figure 1 Knowledge Management Processes (García-Holgado et al., 2015)

The knowledge archives should also enable quick access, customised access based on needs, precise and clear presentation and timely and consistent content (Allameh, Zare & Davoodi 2011).

Knowledge codification is a process of organising and representing knowledge so that it can be accessed and used (Kimble 2013). It involves conversion of tacit knowledge to explicit knowledge (Kimble 2013). Hansen, Nohria & Tierney (1999) have defined codification as a strategy to extract knowledge from wise employees and store it in a system which is accessible by other employees. The knowledge codification process comprises three main processes: knowledge externalisation, knowledge representation and knowledge organisation. *Knowledge externalisation* is the process to transform tacit knowledge into explicit knowledge. This conversion is required as tacit knowledge is not easily describable, so it is difficult to store (Albino 2001). *Knowledge representation* is the process to give a graphic form or structure to explicit knowledge. This could be done through different information and communication codes such as flow charts, drawings, tables, figures and textual information. Until explicit knowledge is formally represented, it is informal knowledge. In addition, knowledge representation makes knowledge the property of an organisation rather than that of an individual (Jarrar, Schiuma & Zairi 2015). *Knowledge organisation* is the process to categorise, structure and contextualise the codified knowledge. Codified knowledge is usually spread over various documents, electronic databases and expert systems. Organisations enable the identification and storage of knowledge according to specific rules. This enables improved knowledge utilization, which refers to using knowledge (Jarrar, Schiuma & Zairi 2015).

Tacit knowledge can be extremely difficult to codify. It can also be sometimes termed as implicit knowledge which means application of explicit knowledge. There are three phases to codify tacit knowledge (Parsaye & Chignell 1988).

- Structured interviews with knowledgeable employees.
- Task analysis from 'learning by being told' which refers to the acquisition of knowledge through verbal or written instruction, rather than through direct experience or discovery. This form of learning typically involves the transmission of explicit knowledge, making it particularly relevant to the Externalization and Combination phases of the SECI model.
- Observing problem solving (watching employees doing things) or reading case studies by knowledgeable employees.

Interviews with knowledgeable employees help in capturing best practices that interviewees possess (Parsaye & Chignell 1988). Once the knowledge is identified then it is broken down

into smaller and more manageable steps. This is called task analysis. It makes learning that skill easier. As listening and acquiring knowledge depends on individual's capability, observing employees performing the task can help in identifying new information which was not acquired during interviews (Jamshed 2014).

Some other codification tools are Knowledge maps, Decision trees, Decision tables, Frames, Production Rules and Case based reasoning (Kimble 2013). A *knowledge map* is a visual aid or a tool for presenting where knowledge resides in a group or an organisation. A *decision tree* is a decision support tool that uses a tree like structure to show model of decisions and their consequences which include outcome, costs and utility. A *decision table* is a table like structure to enter rule logic. It consists of conditions, represented in row and column headings and actions represented as intersection points of conditional cases in the table. *Frames* represent knowledge about a particular idea in a data structure. *Production rules* are conditional statements that specify an action to be taken when a certain condition is true. *Case based reasoning* is reasoning based on past cases as humans use past experiences to conclude (Kimble 2013).

Knowledge application is the step where knowledge is used and integrated into organisational products and services (García-Holgado et al., 2015). Grant (1996) suggested that to improve organisational capability and achieve competitive advantage, organisations must integrate acquired knowledge into their firm's capabilities. Gold et al. (2001) explain that knowledge application is the exploitation and use of available knowledge to make competitive decisions and perform tasks through *directions* and *routines*. Direction is the process to direct the actions of an individual by another knowledgeable individual without transferring the underlying knowledge required to perform the action. For instance, a help desk officer might give instructions to resolve a problem and a customer could perform those tasks as directed without understanding the technical processes involved. The use of documented procedures, policies, rules and practices (such as those in procedure manuals or policy documents) is called routines (Becerra-Fernandez & Sabherwal 2010).

Knowledge protection, which is the focus of this thesis, refers to processes and activities to prevent the leakage of knowledge to outsiders and competitors. The main aim of KP is to limit the exposure and transfer of critical organisational knowledge to outside organisations (Dedeche 2014).

Organisations believe that effective KP can enable them to draw distinctions in their business processes (Tsoukas & Vladimirou 2001). Effective organizational KP provides the ability to outperform competitors in the marketplace and prevent imitations by competitors (Brown & Duguid 1998). The leakage of knowledge from an organisation to its competitors can cause

damage if it passes through these three stages: leakage from the organisation, acquisition by competitors and application of knowledge by competitors (Mohamed et al. 2006).

Knowledge leakage is an unwanted knowledge transfer or deliberate or accidental loss of knowledge from an organisation to its competitors (Ahmad, Bosua & Scheepers 2014; Annansingh 2012). As already mentioned, knowledge acquisition is the first step of knowledge management in the business. However, sometimes leaked knowledge can be acquired by a competitor organisation when it enters their boundaries. For example, Organization A may have successfully executed a development project and shared detailed information about it online. Organization B then downloads this information and leverages it to implement a similar project at a lower cost. (Mohamed, Mynors, Grantham, Walsh & Chan 2006). Furthermore, leaked knowledge is not always acquired by competitors. It is possible that knowledge gets leaked but remains unacquired and unnoticed in the public and competitor organisations are not able to absorb the acquired knowledge. The greater risk occurs when competitor organisations acquire the leaked knowledge and apply it to their advantage and enable them to imitate their competitors' processes. This risk is called competitive advantage damage or erosion. The measures taken to disable any of these three stages of knowledge leakage, knowledge acquisition and knowledge application can prevent the risk impact and are known as KP strategies (Dedeche 2014).

2.3.3. Summary

Organisations view knowledge as one of their most important strategic resources (Jarrar, Schiuma & Zairi 2015), so it must be managed effectively to generate competitive advantage. The unwanted transfer of knowledge from organisations to their competitors is the main reason for competitive advantage erosion (Treem & Desouza 2012). Knowledge management processes such as acquisition, creation, storage and sharing are the sources of competitive advantage and innovation (Ahmad & Bosua 2014). Knowledge leakage increases the risk of operational and strategic damage to the organisations.

Hence, KP is required to limit the exposure and the transfer of knowledge to outside competing organisations. Even though businesses know and understand that KP is a strategy in which they should invest to gain competitive advantage and innovate, it still has been neglected. Past research has also shown that KP is the most overlooked and neglected process among all other knowledge management processes (Bolisani, Paiola & Scarso 2013). The next section discusses KP as a focus area of the thesis.

2.4. Knowledge protection

KP refers to the efforts made by an organisation to prevent knowledge "from being altered, transferred to other organizations, lost, or becoming obsolete" (Bloodgood & Salisbury 2001, p. 57), and Figure 2 provides an outline of different knowledge protection methods. KP strategies are broadly classified into three categories: formal, semi-formal and informal knowledge protection (Zins 2007).

Formal KP methods arise mostly from intellectual property (IP) protection legislation. These methods are termed as formal methods as they require legal authorization (World Intellectual Property Organization (WIPO) 2020). Formal KP methods include patents, trademarks, copyrights and design patterns (Passi, Valkokari, Hytonen, Huhtilainen & Nysten-Haarala 2012). These protection methods are effective in protecting knowledge that can be codified and embodied in products and services, for example a software program or a new lunch box design. Individuals and organisations who produce new knowledge and innovative ideas apply for protection using these methods and government agencies evaluate the novelty of the knowledge and grant legal protection for exclusive use and licensing rights, usually for years. Formal methods imply the need for codification and validation which could take a long time and significant investment from companies. For instance, codification means firms must represent their product or service in a tangible form, for example a document, a model or code which can be verified to be an authenticated work before providing a patent or trademark. Validation means that firms must provide evidence to prove that they are the original creators. **Formal methods** help firms to define knowledge sharing boundaries and help mitigate the risk of knowledge spillovers (Paallysaho & Kuusisto 2011).

Here are some examples of formal KP methods:

- **Patents:** A patent is a right to exclude others from making, using, or selling an invention. It is granted for a device, substance, method or process that is inventive and useful (IP Australia 2018).
- **Design:** A design refers to the features of shape, configuration, pattern or ornamentation which give a product a unique appearance and must be new and distinctive. A registered design gives an exclusive right to its owner to commercially use, license or sell it (IP Australia 2019).
- **Trademark:** A Trademark is a right to protect against the use of identical marks in trade for good and services. It is a form of IP protection provided to visibly recognized signs, for example words, symbols, shapes and images (Passi, Valkokari, Hytonen, Huhtilainen & Nysten-Haarala 2012). A trademark is used to distinguish an

organization's goods and services from those of another business. However, a trademark is not a design. Designs need to be unique or new to be registered whereas a trademark does not (IP Australia 2018).

- Copyright: Copyright is a type of IP that provides exclusive publication, distribution and usage rights to the author. Mostly books, poems, songs, films and artwork are protected under copyright. It is one of the protections right which is easiest to attain as it is automatic, which means when you publish something original, in Australia it is automatically protected by copyright law (IP Australia 2018). However, copyright is categorized under formal methods as in some other countries it needs to be formally registered (US copyright 2016).

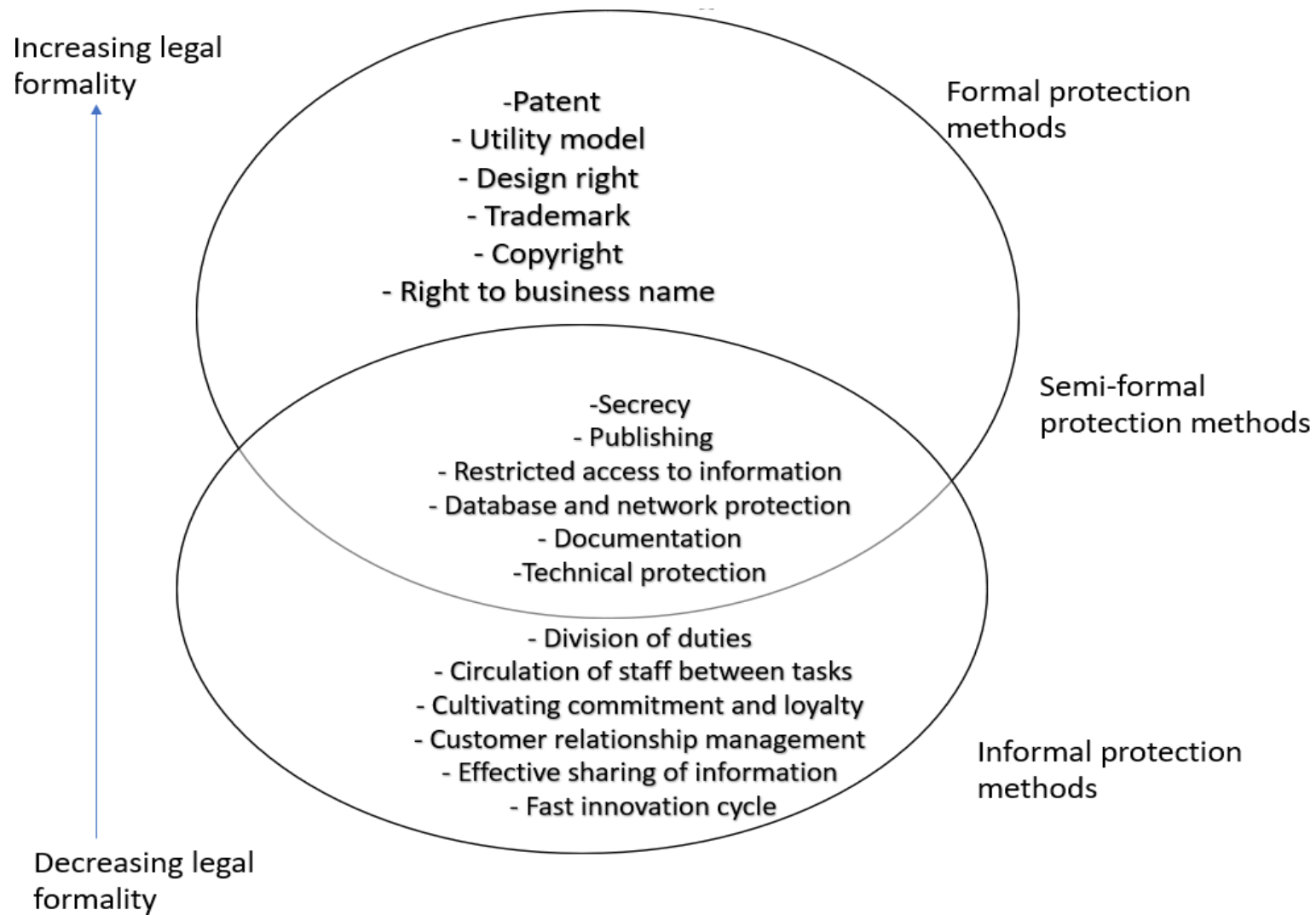


Figure 2 Knowledge Protection methods according to their legal formality
(Paallysaho & Kuusisto 2011)

The application of formal methods is generally a time-consuming and expensive process. To gain the most benefit from formal methods, such as patents, design rights and trademarks, companies need to be aware of the related rules and regulations and are required to formally apply for them. In addition, to maintain patents, companies must pay an annual fee which further makes them more challenging for smaller businesses. Another problem with patents is the potential threat of the knowledge becoming publicly available (Paallysaho & Kuusisto 2011). In order to acquire a patent, the content of the innovation must be disclosed to outsiders such as government authorities and if a patent is granted then the patent is published in an official journal of patents as well as online on IP websites. If the patent is not granted, the invention becomes public and the business potentially loses its competitive advantage (Paallysaho & Kuusisto 2011).

Informal methods of KP are methods which are based on companies' internal policies and processes rather than any legislation (Passi, Valkokari, Hytonen, Huhtilainen & Nysten-Haarala 2012). Informal methods of KP generally do not require extensive investments, validation or codifications (World Intellectual Property Organization (WIPO) 2020). The implementation of informal methods does not require many tools and technologies. Hence, these methods are often attractive to smaller businesses and 'low-tech' industries (with limited usage of technology) (Byma & Leiponen 2006). In addition, informal methods do not always require any legal policies. They can be embedded into an organization's business routine operations. Sometimes organisations adopt informal KP methods without realizing that they also provide KP (Paallysaho & Kuusisto 2011). These approaches can be applied more strategically than traditional formal protection methods, as they offer greater flexibility and adaptability. Rather than relying solely on legal mechanisms, such as patents or copyrights, these strategies allow firms to respond dynamically to market changes, competitor actions, or internal innovation cycles (Passi et al. 2012).

Informal protection methods differ from each other by their nature and the purpose of their use. Most of these methods aim to protect the business from internal risks, for example the prospect of employees who hold valuable knowledge leaving the organisation and their knowledge being used elsewhere (Hall & Sapsed, 2005). Also, sometimes informal methods can be used to protect businesses from external risks, such as the exploitation of new ideas by competitors (Paallysaho & Kuusisto 2011). Here are some examples of informal KP methods:

- **Authentication:** is the process of verifying the identity of a person or device. Before individuals or organisations can retrieve knowledge, they have to verify their identity and access is granted accordingly (Miles 2000).

- Authorization: is one step after authentication. It is the mechanism used to determine users' access levels and privileges. For instance, is the person allowed to read, write, update or delete knowledge (Miles 2000).
- Cabinet locking: is simply to place documents, manuals or any other form of explicit knowledge in a locked cabinet. The lock could be a physical lock or a virtual lock in the form of a password on digital files (Jarrahi 2013) .
- Division of work: allocating fragmented work to employees. This means decomposing a business process to separate tasks and allocating them to different employees. Thus, employees only know about their fragment of work, not the entire process. Both secrecy (discussed below) and division of work are the ways to reduce the risk of knowledge loss when employees leave the organisation (Paällysaho & Kuusisto 2011).
- Fast innovative cycle: companies with fast development cycles and a continuous flow of new and innovative products and services face less risk of competitive damage because competitors cannot imitate their products or services before they are updated (Teece 1986). According to Moore (1996), this strategy is most suitable for smaller businesses because of their ability to respond quickly to changed market requirements.

Semi-formal methods of KP methods are methods that lie in between formal and informal methods. Some examples of semi-formal KP methods are:

- Secrecy: is to keep knowledge secret from employees and external collaborators, for example customers, suppliers and business partners. Organisations need to be careful when classifying knowledge as secret because it can negatively impact potential innovation (Miles 2000).
- Publishing: is to publish a new idea or a working practice widely so that the developer or the owner of the idea is well known as the innovator. The ethics of the business community potentially limits the imitation of new ideas (Päällysaho & Kuusisto 2011).
- Restricted access to information: information could be protected by limiting the number of people who can access sensitive information. Access could be restricted at a physical or functional level, for example not allowing visitors or, contractors into a building or limiting access privileges to computer documents (Päällysaho & Kuusisto 2011).

- Technical protection: means using instruments or technologies to protect sensitive information, for example firewalls, encryption/decryption or making software's difficult to reverse engineer (Päällysaho & Kuusisto 2011).

Formal, semi-formal, and informal methods of KP can complement one another, offering businesses a flexible and layered approach. A study conducted in 2011 by Päällysaho and Kuusisto on the uptake of KP practices found that businesses frequently adopted informal methods such as secrecy, publishing, restricted access, division of duties, and technical measures like authentication and authorization. This preference reflects the practicality, flexibility, and ease of implementation often associated with informal methods. Ideally, a combination of methods is used, tailored to the specific context and protection needs.

The presence of ICT can influence the protection behaviour adopted by businesses. Availability and use of ICT tools can help to increase the KP capabilities of an organisation, especially in relation to security of and access to knowledge. ICT tools can assist in a range of semi-formal and informal KP strategies. For example, access control can be enforced by authentication and can be implemented through identification badges, biometric sensors, voice recognition or simple password protection (Shrafat 2018).

Moreover, in the context of inter-organisational networks, Thalmann et al. (2015) identified informal practices such as selectively sharing information and omitting sensitive details as effective strategies to balance knowledge sharing with protection. These practices enable organisations to engage in collaborative networks while mitigating the risk of knowledge leakage. The author stated that formal methods represent only the 'tip of the iceberg' among protection methods. Bolisani, Paiola and Scarso (2013) indicated in their study performed on knowledge intensive firms indicated the use of both formal and informal KP methods. Formal methods like patents, trademarks, copyrights are used alongside adoption of informal methods like secrecy, division of duties etc. (Bolisani, Paiola and Scarso 2013).

A 2023 study by Min, Zhou and Zhang has examined 192 knowledge-intensive firms in China, revealing that formal (e.g., patents, copyrights) and informal (e.g., secrecy, restricted access) knowledge governance mechanisms (KGMs) jointly enhance knowledge quality and indirectly foster knowledge creation. This synergy underscores the importance of employing both methods in tandem to manage knowledge processes effectively.

Furthermore, Aslam et al. (2024) highlighted the role of information and communication technology (ICT) tools in facilitating both formal and informal KP strategies, finding that ICT-enabled KGMs positively impact innovation speed and quality in ICT firms by enhancing absorptive capacity and supporting the integration of diverse protection methods. Similarly, Ali and Tang (2022) emphasised the significance of informal KP methods, particularly for

small or resource-constrained organisations, noting that informal IP protection being cost-effective and easier to manage can be especially beneficial in certain contexts and can complement formal methods to create a comprehensive protection strategy. Thus, a broad variety of protection methods are not mutually exclusive or competing with each other; rather, they support one another, and a hybrid approach that combines formal and informal KP methods provides a more robust form of knowledge protection.

2.5. Small and Medium Sized Enterprises

This section focusses on small and medium-sized enterprises (SMEs), examining how businesses are categorized as large, medium, or small enterprises and analyzing the influence of SMEs on a country's economic growth. As the research was centered on Australian SMEs, the study specifically discusses this group within the Australian context.

Enterprises are usually classified into three categories based on size: small, medium and large. Often small and medium sized businesses are grouped together as SMEs. A fourth group can be added to these, called microenterprises, which are a subset of small businesses. This categorization is very important as there are many public grants for SMEs that larger businesses cannot apply for (Berisha & Pula 2015). Firms can be classified by several criteria: the **economic criterion**, which looks at a business's turnover; the **technical criterion**, which refers to the firms's level of investment in innovation and technology; the **equity criterion**, based on the net assets a company holds; and the **organisational criterion**, which considers the number of employees in the organisation (Berisha & Pula, 2015).

There are quite a few definitions for SMEs based on organisational criterion. From an OECD viewpoint, organisations with fewer than 50 employees are small firms and those with at most ten and in some cases five are considered as micro-enterprises. Companies employing 50 - 249 employees are termed as medium enterprises (OECD 2005). Therefore, SMEs have between 1-250 employees using the OECD definition. SMEs are non-subsidary, independent organisations.

However, the definition of SMEs varies from country to country (OECD 2005). Some countries define the size based on the number of employees and some are based on annual sales and assets. In some areas the definitions vary from industry to industry. For instance, the European Union uses organisation criterion to define SMEs and has set the upper limit for SMEs to 250 employees whereas in some other countries it is 200. The United States state that SMEs include firms comprising up to 500 employees (European Commission 2012).

SMEs are sometimes also defined based on annual financial turnover, using a combination of organisational and economic criterion. According to the European Union, medium-sized organisations have 50-249 employees and turnover less than EUR 50 million, small enterprises have 10-40 employees and less than EUR 10 million turnover and micro-sized firms have less than ten employees and should not exceed EUR two million turnover (European Commission 2012).

According to the Australian Bureau of Statistics, small businesses employ one to 19 employees are termed as small businesses and those with 20 to 199 employees are categorized as medium sized organisations (ABS 2015). This classification is performed using organisational criterion.

This research will use organisation criterion and the ABS definition as a way to define SMEs as the study is mainly for Australian SMEs. As discussed earlier, SMEs are made up of small and medium sized businesses. The mostly discussed characteristics of SMEs are:

- *Limited Resources and dependence on few employees:* SMEs have limited resources, and this scarcity is particularly acute in new startups. Due to their short (or nonexistent) track record, they often struggle to attract investors and financial institutions, resulting in a heavy reliance on the owners to generate resources (Beck & Demirgüç-Kunt, 2006).
- *Informal management style and relationships:* For many SMEs, management practices are informal, meaning there is often no clearly defined reporting structure. Owners typically act as both directors and managers across multiple business areas, and formal task divisions are limited. As a result, employees frequently work collaboratively and share responsibilities to perform essential business processes (Jennings & Beaver, 1997).
- *Simplicity:* SMEs' small size and informal structure provides a simple business structure. They do not always require specific board meetings or stockholders' approval for implementing something new, such as a new major decision which could be about business direction or launching a new product or strategy (Carpenter 2017).
- *Flexibility:* SMEs have more flexibility to adapt to changes in the market and environment because of their informal structure and small size (Matejun 2014).
- *Dependence on individual decision makers:* Small sized firms are usually managed and operated by the owner. All the business decisions are made by the business owner, so growth often depends on owners' skills and financial management (Beck & Demirgüç-Kunt, 2006).

- *Niche markets*: The focus of SMEs tends to be narrow as they typically focus on a small and limited number of products and services. Targeting a narrower audience allows SMEs to focus on their efforts on catering to specific customer needs which provides stability to their business. However, this can also cause them to overlook other required business processes. For example, a construction business focusing on developing new building designs might overlook keeping them safe. The small size of SMEs helps to provide specialized services and niche products, but it can be a disadvantage when it comes to obtaining finance. Limited finances can affect SMEs' marketing and their ability to focus on non-core business activities (Carpenter 2017).
- *Relationships*: SMEs invest in a small number of products and services. Due to this they can build strong relationships with their customers and business partners, which in turn can provide business stability (Carpenter 2017).

2.6. Significance of SMEs

The SME sector plays a particularly important role in modern economies (Ayyagari, Beck & Demirgüç-Kunt, 2007). They have beneficial effects for the economic growth of nations through the roles they fulfill (Beck & Demirgüç-Kunt, 2006). They are acknowledged worldwide as drivers of socio-economic development due to their important role in GDP growth, new job creation and entrepreneurship (Karadag, 2016). In a constantly changing economic environment SMEs provide benefits in agility, dynamism and innovation. The flexible nature of SMEs enables them to respond quickly and adapt to changing environments. Their creativity fosters innovation, initiative, and risk-taking, key elements of the entrepreneurial mindset that drive new business development and contribute to economic growth (Savlovski and Robu 2011).

Even though it is considered that the role played by SMEs is more vital in developing countries, they still account for 50% of GDP in developed countries as well (Karadag 2016). For instance, SMEs are considered to be a backbone of the European economy, as 99.8 % of all non-financial businesses are comprised of SMEs, providing 58% of total value added and 66% of total employment (Briozzo 2012). In Japan, SMEs account for 99.7% of all companies, 70% of all employment and more than 50% of all added value (Karadag 2016).

Romanian SMEs were identified as important job creators, providing social stability. They are also considered as the biggest source of competitiveness and producers of goods and services. Thus, they help in forming GDP and increasing national exports. SMEs are more focused on innovative processes both in technology and in management (Neagu 2016).

Malaysian SMEs not only provide job opportunities but also contribute to the development of big and multinational corporations. They serve as supporting firms to large companies. For example, they provide raw materials to large manufacturers in automotive industries and sell products of large chemical and timber companies (Tehseen et al. 2015). In 2020, SMEs signified about 97.3 % of total business establishments and contributed 33.1 % of the country's GDP. Domestic SMEs are an important factor of growth for Malaysia to achieve development and become a high-income nation (SME Corp. Malaysia 2021).

According to National Business association (2025), SMEs are vital to the U.S. economy, creating two out of every three new jobs and employing 61.7 million people in 2023, which represents 46.4% of the private workforce. From 1995 to 2023, they generated over 17 million net new jobs, underscoring their role as a primary driver of employment. Additionally, they contribute about 43.5% of the nation's GDP, making them a significant force in economic output.

SMEs are one of the major contributors to the Australian economy. According to the Department of the Industry, Innovation, Science, Research and Tertiary Education (2017), there were over 1.3 million active Australian businesses as at June 2015. Of these, approximately 96% were small businesses and 3.8% were medium businesses. This overwhelming majority of SMEs has a significant effect on the Australian economy. One of the key reasons of their importance is that they are a major source of employment for Australians. According to the Australian Small Business and Family Enterprise Ombudsman (ASBFEO), drawing on ABS data for 2022–23, small businesses (with 0–19 employees) employed approximately 5.368 million people 42% of the private sector workforce while medium businesses (with 20–199 employees) employed around 3.184 million people, representing 25%.

One more reason behind the importance of SMEs is that they are a major source of innovation for the industries they operate within. SMEs use innovation to compete against large businesses with more resources. According to the Australian Bureau of Statistics (2017), about one third of research and development in high technology industry was carried out by small businesses alone. Table 1 shows the industry value added contribution by small businesses, which totaled \$343.4 billion in 2013-14, which was \$8.1 billion or 2.4% more than the previous year. Industry value added (IVA) is the measure of the contribution by private businesses in each industry to Gross Domestic Product (GDP). When sorted based on IVA, Rental, hiring & real estate services, Construction, Professional, scientific & technical services, Health care and social assistance (private) and Retail trade were the top five SMEs with the highest contribution towards Industry value.

Table 1: Value and share of Industry Value Added by small businesses by industry

Industry sector	Small business IVA (\$billion)	Share of small business IVA (%)	Total IVA (\$million)	Share of total IVA (%)
Rental, hiring & real estate services	53.8	15.7	67.4	5.2
Construction	50.4	14.7	108.4	4.9
Professional, scientific & technical services	42.5	12.4	102.3	4.1
Health care and social assistance (private)	25.3	7.4	66.6	2.4
Retail trade	24.3	7.1	71.4	2.3
Wholesale trade	22.6	6.6	66.8	2.2
Agriculture, forestry and fishing	22.0	6.4	27.5	2.1
Manufacturing	18.5	5.4	97.5	1.8
Transport, postal and warehousing	15.5	4.5	67.4	5.2
Administrative and support services	13.6	4.0	50.2	1.3
Mining	12.5	3.6	124.5	1.2
Accommodation and food services	12.3	3.6	37.0	1.2
Education and training (private)	3.5	1.0	23.7	0.3
Electricity, gas, water and waste services	2.8	0.8	44.0	0.3
Information media & technical services	2.6	0.8	35.9	0.3
Arts and recreation services	2.6	0.8	11.7	0.3
Other services	18.6	5.5	35.3	1.8
Total selected industries	343.4	100.0	1037.2	33.1

Source: Australian Bureau of Statistics (ABS 2017)

2.7. Factors influencing Knowledge Protection

This section examines the factors that influence KP strategies. The discussion will be used as the basis for the development of the study's research framework.

2.7.1. Organisational and other factors

2.7.1.1. Industry sector

Industry sector plays a major role in the implementation of KP strategies. As mentioned earlier, KP strategies may differ across industry sectors. For instance, 'low-tech' sectors may be drawn to informal methods of KP. Bolisani, Paiola and Scarso (2013) examined KP in knowledge intensive business services (KIBS) operating in three industries: information and communication technology, design and communication and professional services. They found that the rate of usage of KP methods was generally low across these sectors. There is a direct link between knowledge reuse and protection as companies providing customized

services like accounting or other financial services employ KP mechanisms more frequently than others. The study found that KP is directly proportional to innovation (Bolisani, Paiola & Scarso 2013).

Another empirical study in Finland focused on SMEs has shed some light on the role played by Human Resource Management (HRM) in protecting a company's core knowledge (Olander, Laukkanen & Heilmann 2011). SMEs operating in different industries experience different KP mechanisms. For example, the manufacturing industry places greater importance on patents than the service sector (Cohen, Nelson & Walsh, 2000). Because of short product lifecycles and their dynamic environment, ICT companies are considered as overly complex industry which calls for higher radical innovation (Koberg 2003). The level of industry complexity makes implementation of security measures more challenging. When organizations have many interconnected systems (for example servers, networks and databases) it becomes exceedingly difficult to understand how security controls can be integrated in their infrastructure (Werlinger, Hawkey & Beznosov 2009). This challenge has significant implications for KP, as robust security controls are essential to safeguarding proprietary data, IP, and critical business knowledge (Belsis, Kokolakis & Kiountouzis 2005). Without adequate security, sensitive information is vulnerable to breaches, which can compromise competitive advantage and undermine innovation efforts. Therefore, ensuring effective security controls is not only a technical necessity but a strategic priority for protecting organizational knowledge in complex ICT environments (Kankanhalli et al., 2003).

Industries that rely heavily on creativity and invention, such as the technology, design, and media sectors can be hindered by overly strict KP. When these firms lock down their ideas too tightly, they miss out on chances to work with others and combine their knowledge. This limits their ability to create breakthrough or radical innovations (Savino et al., 2017). Thalmann et al. (2016) discussed the increasing focus on cybersecurity and corporate espionage risks in the financial sector. It highlighted the necessity for financial institutions to implement robust KP strategies to safeguard against cyberattacks and protect trade secrets, especially in the face of evolving digital technologies and the use of social media (Accenture, 2016).

2.7.1.2. Location

The geographic location of a business may also have a direct impact on the use and implementation of KP strategies. Even though there is no study specifically focusing on the relationship between geographic location and KP implementation, it is known that there have been differences in the use of ICTs by SMEs in metropolitan and rural areas (Galloway & Mochrie 2005).

Contigiani and Testoni (2023) examined how the protective function of trade secrecy can inadvertently hinder local knowledge flows, particularly in geographically isolated regions. In such settings, access to external or distant knowledge sources is limited, making local knowledge exchanges a crucial driver of innovation. Firms operating in these isolated environments typically rely more heavily on nearby knowledge to maintain their innovative capacity (Audretsch & Feldman, 1996). Trade secrecy refers to a form of IP protection in which firms guard valuable knowledge by keeping it confidential, rather than disclosing it through mechanisms like patents. It is a widely used strategy in KP, especially in competitive environments where firms fear imitation or knowledge leakage. However, unlike patents that involve public disclosure in exchange for legal protection, trade secrecy can restrict the sharing of information even within local networks.

However, when trade secrecy is strongly enforced, it can discourage the free exchange of knowledge among local actors. This creates a tension in firms' KP strategies: while secrecy aims to safeguard intellectual assets, it may also suppress informal, trust-based knowledge sharing within local networks. This suppression can be particularly damaging in isolated regions where firms cannot easily substitute local knowledge with insights from broader, more connected ecosystems (Contigiani & Testoni 2023).

Ultimately, Contigiani and Testoni (2023) argue that strong trade secrecy protection can amplify the negative effects of geographic isolation on innovation. By limiting access to both distant and local knowledge, firms face a compounded disadvantage unable to draw from broader innovation networks and simultaneously restrained from leveraging nearby resources. This highlights the importance of aligning KP strategies with regional innovation dynamics and geographic constraints.

2.7.2. SME factors

2.7.2.1. *Size/structure*

This section will discuss studies specifically on KP by SMEs. As noted by Faria & Sofka (2010), large businesses tend to adopt a wide range of KP strategies. Päällysaho and Kuusisto (2011) investigated IP protection and management practices in small service firms in Finland and United Kingdom. The study demonstrated that small firms prefer informal protection practices over formal methods. Moreover, small service firms pay little to no attention towards patent protection. The results also indicated that the protection of services is very difficult by means of IP rights and that is why is given least attention by small service firms.

According to Leiponen and Byma (2009), formal KP mechanisms involve lengthy application procedures and require substantial resource commitments, making smaller firms with limited resources less inclined to adopt them. As a result, informal methods become more attractive to smaller firms (Birk 2006) because they are easier to implement and less time-consuming. However, these informal KP methods can also present challenges, as they are not static and require continual updating and active maintenance (Paallysaho & Kuusisto, 2011). For example, passwords must be changed regularly, and the rapid pace of innovation demands constant development and renewal as organisational environments evolve.

Olander, Laukkanen & Heilmann (2009) demonstrated the challenges of retaining core knowledge and capturing value by SMEs in choosing between knowledge sharing and protection. Olander, Vanhala & Laukkanen (2014) also performed another study in Finland to examine the reasons for choosing formal and informal mechanisms in SMEs. They identified a significant relationship between the need for KP and the firm's strategy. Organizations nowadays concentrate heavily on external knowledge which requires effective innovative activities to capture value. Innovation is heavily dependent on organisations' collaborative structure. Such collaborations between organisations to acquire each other's critical knowledge generally requires the implementation of KP strategies. As KP strategies ensures safety in knowledge sharing activities and helps in preventing the uniqueness of outputs of knowledge exchange. To prevent knowledge leakage risks in firm collaborations, companies select both formal and informal ways of protection. The size of smaller businesses limits their ability to access more formal methods (Olander, Vanhala & Laukkanen 2014).

As mentioned above, KP sometimes acts as a barrier to knowledge sharing. But with efficient KP mechanisms SMEs can reap the benefits of inter-firm collaborations, without losing their core knowledge. SMEs have previously won market share with collaborations. For example, SEMATECH, a consortium created with the collaboration of 14 competing SMEs in the US, has achieved breakthrough innovations and was also able to retain their market share from Japanese firms (Browning & Shetler 2000). SEMATECH facilitated pre-competitive research that accelerated the development of next-generation semiconductor manufacturing technologies. By pooling their resources and aligning strategic goals, member firms reduced duplicative R&D efforts and significantly shortened innovation cycles. According to Estrada, Faems and Faria (2015), such inter-organizational collaborations not only enhance firms' absorptive capacity but also allow SMEs to access complementary knowledge, ultimately leading to more effective innovation outcomes. SMEs can share knowledge with their partners to make strategic decisions, leading to innovations that none could have achieved independently.

2.7.2.2. Owner/Manager

One of the characteristics of SMEs is their informal management style, where the owner of the business often acts as the manager as well (Beaver & Prince 2004). As SMEs are managed directly by their owners, this simplifies their decision-making processes, making them largely dependent on the talents and abilities of their managers (Jennings & Beaver 1997). Consequently, SMEs exhibit higher flexibility and resilience during periods of economic downturn, owing to their capacity to adapt to changing markets (Neagu 2016). This adaptability is further influenced by the owner-manager's decision-making style, which significantly impacts the creativity and effectiveness of marketing strategies, thereby affecting overall organizational performance (Seronato & Martins 2024). Additionally, previous studies have identified that top management has a direct impact on the implementation of knowledge management strategies (Keramati & Azadeh 2007; Lee, Shiue & Chen 2016). To anticipate future technological needs, managers should engage in long-term strategic planning and ideally select strategies based on existing practices and the challenges faced (Keramati & Azadeh 2007). However, SMEs are typically short-term planners and conservative adopters of information technology, often reflecting the characteristics of the owner/manager (Sellitto, Banks, Bingley & Burgess 2016). Recent research supports this, indicating that the individual characteristics of SME owner-managers, such as their knowledge and experience, are significant predictors of the risk management strategies implemented, which in turn influence long-term growth (Lee et al. 2023). Moreover, the adoption and utilization of ICT in SMEs are heavily dependent on the owner/manager's individual characteristics and ICT awareness, highlighting the critical role of personal attributes in technological advancement (Çalli et al. 2019). Therefore, it is reasonable to assume that KP practices are also closely related to the characteristics of the owner/manager.

2.7.2.3. Flexibility

SMEs are more flexible than their larger counterparts (Burgess, Sellitto & Karanasios 2009), which makes it easier for them to introduce informal KP. As such, they do not have to go through lengthy formal procedures to change approaches and may find it easier to adjust to the adoption of KP strategies. The flexibility of the organisational structure, which supports adaptive KP mechanisms, is consistent with earlier studies (e.g., Grant 1996) that emphasise structural agility as a key enabler for tacit knowledge management. More recent research supports this view, indicating that SMEs often implement knowledge management practices in a less structured and more fluid manner, which enhances their ability to adapt quickly to market changes and internal learning needs (Pina & Avila 2023). This informal approach

fosters agility and responsiveness, enabling SMEs to embed tacit knowledge into daily operations more organically than their larger counterparts (Ibrahim et al. 2022).

Furthermore, the culture within SMEs tends to be less hierarchical, promoting open communication and interpersonal trust factors known to facilitate the sharing and application of knowledge (Curado & Vieira 2019). The ability of SMEs to swiftly experiment and pivot their operations also supports continuous learning and innovation, both of which are strongly linked to effective KP practices (Mata, Moleiro Martins & Inácio 2024). This responsiveness is further enhanced when acceptance of mistakes and learning from failure are embedded into the organisational culture, which strengthens the mechanisms for tacit knowledge exchange and boosts overall organisational agility (Saleh et al. 2023). Therefore, the inherent adaptability of SMEs not only simplifies the adoption of KP strategies but also strengthens their capability to manage knowledge for sustained innovation and performance (Wang & Ahmed, 2004).

2.7.2.4. Relationships

Strong relationships of SMEs with their suppliers and collaborators also make it easier for them to share information (e.g., open innovation) (Lee, Park, Yoon & Park, 2010). However, at the same time to protect their unique ideas and innovation from imitation they require implementation of various KP strategies. While open innovation is increasingly important for many businesses, it can raise concerns about KP. Effective protection mechanisms are essential to encourage firms to pursue risky and uncertain R&D and innovation initiatives (Chesbrough 2011).

As Durst and Zieba (2017) and Durst and Ferenhof (2014) highlight, SMEs often operate without formal KP measures such as documented procedures, confidentiality agreements, or systematic knowledge retention strategies. This lack of structured knowledge management meaning the deliberate and organized handling of knowledge assets can leave SMEs vulnerable to unintended knowledge outflows. For example, Durst and Zieba (2017) describe how employees may unknowingly share sensitive process insights or customer-specific know-how during informal conversations with external collaborators or even with new staff members, without realizing the strategic value of that knowledge. This kind of internal leakage typically occurs during routine relationship-building activities, such as partnerships, client meetings, or collaborative projects. At the same time, SMEs often rely on open knowledge sharing the free and trust-based exchange of information to maintain flexible, innovative relationships with partners and stakeholders (Van den Hooff & de Ridder, 2004). The challenge, then, lies in balancing this openness with adequate protection. Without this

balance, the very relationships that drive SME growth may inadvertently lead to the erosion of their intellectual capital.

2.8. Knowledge Protection Benefits

Many studies (Amalia & Nugroho, 2011; Desouza, 2010; Greiner, Bohmann & Krcmar, 2007; Lee & Lan, 2011) suggest that KP contributes to innovation, which is one of the key sources of economic growth (ABS, 2007). Beyond innovation, several additional benefits of KP have been identified, including competitive advantage and value creation (Grant, 1996). Resources and capabilities can provide competitive advantage when they are valuable, rare, and difficult to imitate (Soto Acosta & Merono Cordon, 2008). Businesses can leverage these resources to build capabilities that generate sustained competitive advantage (Rivard, Raymond & Verreault, 2006).

Even though KP is an important topic, it is still a new and under-researched area (Manhart & Thalmann 2015). Ha, Lo and Wang (2015) examined the relationship between knowledge management and organisational performance in SMEs in Malaysia and found that KP is one of important antecedents for organisational performance. Poor knowledge management and protection in SMEs can cause knowledge to become obsolete and useless (Karimi & Javanmard 2014). Desouza and Vanapalli (2015) argued that firms should pay attention towards implementation of KP strategies to avoid imitation by competitors and achieve sustainable competitive advantage. Furthermore, Liu and Deng (2015) found that business process outsourcing performance is directly and positively impacted by KP capabilities.

2.9. Research Questions and theoretical framework

This research aims to explore the use and implementation of KP strategies by Australian SMEs. KP is an especially important process within knowledge management to sustain competitive advantage and protect organisational knowledge from spill overs and leakages. KP is often overlooked and neglected in SMEs even though knowledge is one of the critical assets (Bolisani, Paiola & Scarso 2013).

The research builds a theoretical framework to address the aims of the research. This approach will consider the impact of SME and organisational characteristics on the use of KP strategies. It will also help to increase further understanding on the impact of KP strategies on organisational performance. While the use of both formal and informal KP mechanisms is well-documented, this study contributes a new integrative model that simultaneously accounts for the enablers, barriers to KP adoption and performance impacts of KP strategy adoption. In doing so, it expands on previous frameworks and responds to gaps identified in both the knowledge management and innovation protection

literature. Although similar models have been used in prior studies, this particular model is being applied for the first time in the present research. Some of the foundational models that have shaped the understanding of KP in organisational contexts are discussed below.

Olander et al. (2014) presents a useful model for understanding how firms choose between formal and informal KP mechanisms. The model primarily focuses on decision-making factors such as the availability of protection tools, the nature of innovation, and the costs involved. One of the key contributions of this framework lies in its emphasis on how firm strategy and HRM practices shape KP choices. The authors highlight that HRM-related mechanisms such as loyalty building, employee retention, and training can serve as effective informal protection tools, particularly for knowledge that is difficult to codify or protect through legal means. However, the model has limitations such as it does not examine the performance implications of different KP strategies. In addition, it presents KP strategy selection as a relatively static choice rather than a dynamic and evolving organisational capability that changes with context, learning, and external pressures. Their work provides a strong basis for the categorisation of KP methods for this study.

Dedeché (2014) contributed a conceptual framework focused on the risks associated with knowledge leakage. The model identifies three critical stages: the initial leakage of knowledge, its acquisition by external actors (typically competitors), and its application in ways that harm the originating firm. This framework introduces information security paradigms specifically the preventive and responsive approaches and links them to knowledge management practices. It is particularly valuable in highlighting that KP is not solely about codifying or patenting knowledge but also about managing the flow and visibility of sensitive information. However, the model has notable limitations. It does not operationalise how specific organisational factors such as size, structural complexity, or external collaboration shape the adoption of particular strategies. In our study, Dedeché's framework helps justify the importance of a multi-layered KP approach which could be because of the impact of different organisational factors.

Grimaldi et al. (2021) offered a more recent and strategically focused model by classifying firms into three types based on their IP strategies: defensive, collaborative, and impromptu. This typology is particularly useful for linking KP strategy with open innovation (OI) behaviour and outcomes. Defensive strategies aim to block competitors and minimise spillovers; collaborative strategies facilitate value co-creation through IP sharing; and impromptu strategies reflect ad hoc or unstructured IP behaviour. Their work provides important insights into how strategic intent affects both innovation collaboration and performance. However, the model's strong focus on formal IP and its bias toward manufacturing firms limits its utility for contexts where informal KP mechanisms and tacit knowledge play a central role. Additionally,

the model does not account for industry sector variation, organisational structure, or the type of knowledge involved. In this study, we draw on Grimaldi et al.'s strategic framing to differentiate between intentional and reactive KP behaviour, extending their work to account for the organisational and knowledge-based contingencies that drive protection strategy choices.

Finally, Päällysaho and Kuusisto (2011) presented a study that increases understanding on the widespread use of informal KP practices within KIBS firms. Their empirical analysis demonstrates how mechanisms such as employee loyalty, secrecy, technical complexity, and customer trust are used in place of or alongside formal IP rights. One of the key contributions of their research is the attention given to some of the organisational factors such as firm size, sector, and collaboration mode that influence how firms deploy KP strategies. However, the model is constrained by its narrow focus. It does not consider the performance implications of these informal strategies, nor does it provide any comparison across industry sectors. This study has used their classification of protection strategies to identify a broader set of informal mechanisms and to explore how their use is shaped by SME and organisational factors. This enhances our ability to construct a framework that reflects real-world KP practice in diverse organisational settings.

In summary, these four models provide valuable but partial perspectives on KP. By synthesising and extending their insights, this study develops a more integrative framework that considers KP as a strategic choice influenced by SME, organisational and knowledge-specific factors and the benefits reaped from their adoption.

The research will explore the adoption of KP strategies by Australian SMEs by posing the following research questions.

RQ1. To what extent do SMEs adopt KP strategies?

RQ2. What factors enable or inhibit SMEs when adopting KP strategies?

RQ3. What strategies, if any, do SMEs use to protect their knowledge?

RQ4. What benefits do SMEs receive from implementing KP strategies?

KP is mostly overlooked by SMEs (Bolisani, Paiola & Scarso 2013). Hence the first research question identifies the level that SMEs implement KP strategies. The second question extracts information about the factors that enable and inhibit the implementation of protection strategies. Many authors (Leiponen & Byma 2009; Estrada, Faems & Faria 2015; Päällysaho & Kuusisto 2011; Birk 2006) identified various factors that impact the implementation of KP strategies like limited resources, need for knowledge sharing, sustain competitive advantage and innovation.

Prior research has identified two main types of KP strategies - formal and informal (Teece 1986). There is a variance in the adoption of KP strategies across organisations. This is mainly because of differences in the motivation for implementing protection methods or sometimes there are factors that hinder the adoption of certain protection strategies. Different organisations implement different types of protection mechanisms based on resource availability, size, and structure (Olander, Vanhala & Laukkanen (2014). Hence, the third question aims to identify the types of KP strategies implemented and how they are implemented. Lastly the study has also identified if there are any benefits that organisations can reap from the implementation of KP strategies, which addresses the final question.

2.9.1. Preliminary Theoretical Framework

This study develops and refines an existing theoretical framework to identify the factors that influence the use of KP strategies by SMEs. Based on past studies, the implementation of KP strategies is impacted by various factors such as resource availability, firms' needs and strategies, desire for competitive advantage and so forth. The framework recognises that whilst a number of business characteristics influence the adoption of KP strategies, there are also characteristics specific to SMEs that will likely influence KP adoption, which can include a combination of formal, semi-formal and informal methods. Finally, different benefits can be gained from the adoption of KP.

The framework of this research suggests that two groups of factors impact the implementation of KP strategies: Organisational factors and SME characteristics. In addition, KP practices are classified into three categories in this model: a) formal methods b) semi-formal methods c) informal methods (as per Zins 2007). Different benefits are also presented from the adoption of KP strategies. Benefits are analysed mainly based on DeSouza and Vanapalli (2015) and Liu and Deng (2015) The theoretical framework that is used for the exploratory study is illustrated in Figure 3. The framework demonstrates the impact of different factors on KP adoption strategies in SMEs. The purpose of the framework is to identify the factors that impact the implementation of KP by SMEs. The framework presented in Figure 3 is developed by the researcher based on the themes emerging from the study. As no existing model captured these relationships, this framework represents an original contribution of this research.

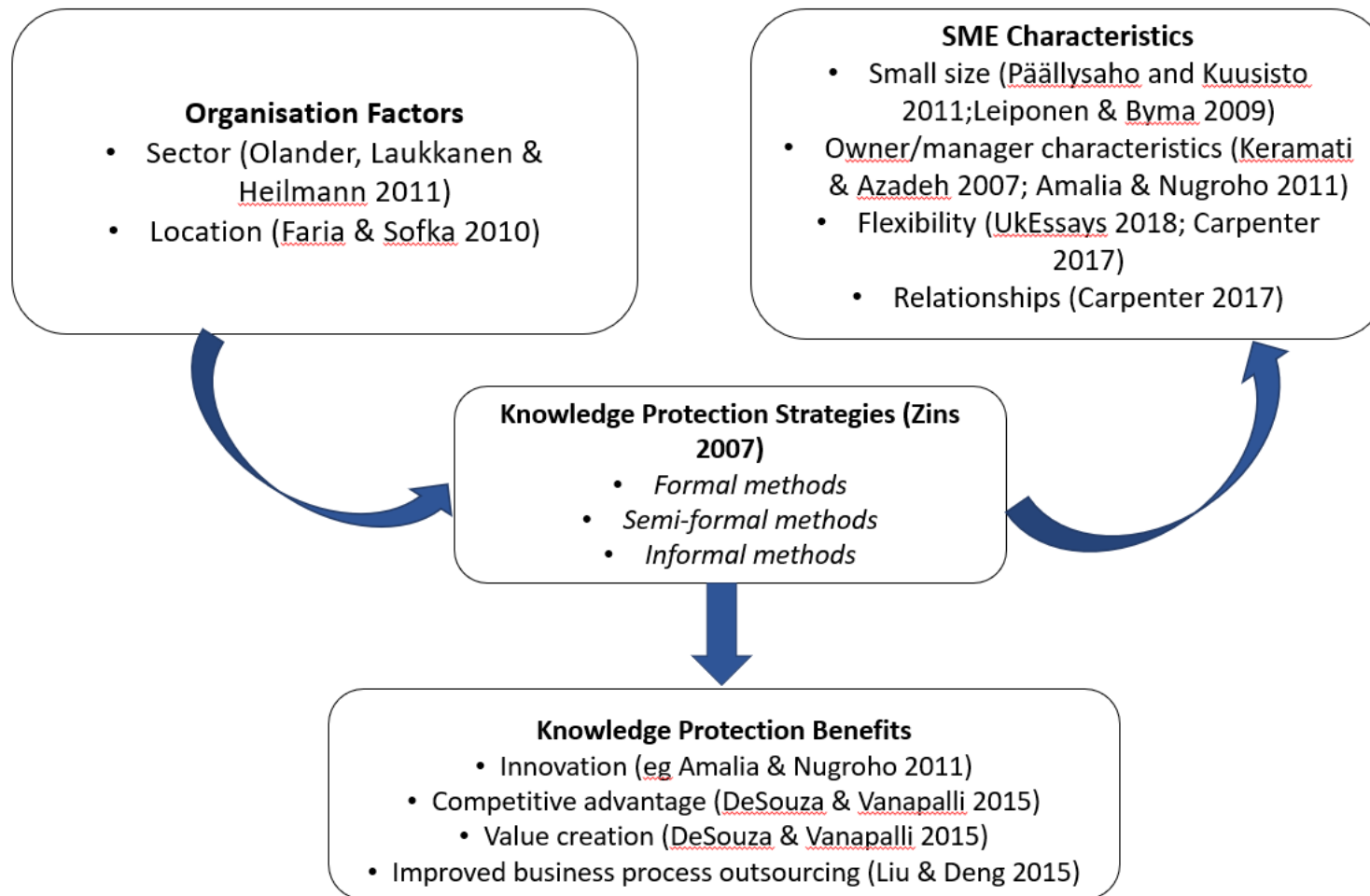


Figure 3 Researchers proposed Preliminary Theoretical Framework

2.10. Summary

This chapter has reviewed literature relevant to the research aims and objective of this study. Among the literature definitions examined were data, information, knowledge, wisdom, knowledge management and KP. Knowledge is one of the most important assets of an organisation so it should be protected from becoming obsolete and being leaked to competitor organisations. This can occur through implementing KP strategies, which are the collection of processes and activities to prevent the leakage of knowledge to outsiders and competitors. KP strategies were broadly categorised into formal, semi-formal and informal methods. Their definitions were derived from the level of legal authorization required where formal methods require a high level of legal authorizations and informal methods require the least. For this study, small businesses are defined as those who employ one to 19 employees and medium businesses employ 20 to 199 employees. SMEs are one of the major contributors to the Australian economy. There are various factors that influence the implementation of KP strategies and for the purpose of this research they have been split into two categories: 1) Organizational factors and 2) SME factors.

Under organisational factors it has been identified that industry sector, geographic location and the age of the organisation have an impact on the use and adoption of KP strategies (Olander, Laukkanen & Heilmann 2011; Faria & Sofka 2010). Different sectors view the necessity of implementation of KP differently, as well as differences in the adoption of protection strategies. For example, 'low tech' sectors usually adopt informal methods whereas companies innovating new designs and products typically employ formal methods. In addition, firms dealing with confidential and sensitive data employ KP strategies more frequently than others.

SME factors include size, structure, owner, flexibility and relationships with partners and suppliers. The availability of resources often depends on the size and structure of the organisation and it has been identified that SMEs may overlook KP strategies because of lack of resources. As the SMEs are mostly managed directly by their owners, the adoption of KP strategies usually depends on their talents and abilities.

The theoretical framework developed for this study recognises that whilst a number of business characteristics influence the adoption of KP strategies, there are also characteristics specific to SMEs that will influence KP adoption. Adopted KP strategies can include a combination of formal, semi-formal and informal methods. Furthermore, the different benefits that can be gained from the adoption of KP need to be assessed.

Building on this theoretical framework, the next chapter sets out the Methodology used to examine how both general business characteristics and SME-specific contingencies shape the adoption and mix of knowledge protection (KP) strategies: formal, semi-formal and informal and the benefits realised. It first justifies the overall research design chosen to align with the study's explanatory aims. It then details the methods employed to capture the breadth and depth of KP practices, followed by the data-collection procedures and operationalisation of the key constructs (business characteristics, SME-specific features, adopted KP strategies, and associated benefits). Finally, it describes the research participants and sampling strategy, including inclusion criteria and recruitment of SME owner-managers and relevant employees. By explicitly mapping each methodological choice to the propositions articulated in the framework, the chapter ensures a coherent and auditable link between theory and evidence, enabling rigorous assessment of KP adoption in SMEs.

Chapter Three: Methodology

3.1. Introduction

This chapter outlines the research design and methods used to conduct the study. Consistent with the study's aim to understand how and why small and medium-sized enterprises (SMEs) adopt different configurations of knowledge-protection (KP) strategies, it adopts an interpretivist stance and an exploratory orientation, leading to a qualitative multiple-case study approach. This design enables in-depth, context-sensitive comparison across cases while preserving the richness of managerial sense-making around formal (e.g., registered IP), semi-formal (e.g., restricted access, contractual clauses) and informal (e.g., secrecy, cabinet locking) KP mechanisms and their perceived benefits.

The main data for this study comes from semi-structured interviews. These interviews followed a set of questions based on the theoretical framework. The questions asked participants to talk about their business background and key characteristics, SME-specific contingencies, adopted KP configurations, and the benefits experienced. The chapter also details the sampling strategy used to select 20 SMEs for literal and theoretical replication in a multiple-case design, specifying inclusion criteria, recruitment procedures, and the roles of participants (e.g., owner-managers and function leads with responsibility for KP). Throughout, the Resource-Based View (RBV) provides a guiding analytical lens for interpreting how firms assemble and protect knowledge assets; its selection and the alternatives considered is justified below. The remainder of the chapter is organised into four sections: research design, methods, data collection procedures, and research participants.

RBV is adopted as the primary lens because it directly aligns with the phenomenon under study: the protection of knowledge as a strategic resource. RBV conceptualises knowledge as a potentially *valuable, rare, inimitable and non-substitutable* (VRIN) resource. KP strategies function as isolating mechanisms that help SMEs appropriate returns from such resources. This provides a coherent vocabulary for linking *which KP mechanisms are adopted* to *why they matter* for competitive advantage. The RBV focuses on what resources a business has and how managers use them. It helps explain why small and medium-sized businesses differ for example, in how owners think, how many spare resources they have, and what skills they possess and how these differences affect their use of knowledge protection (KP) strategies. RBV fits well with the study's approach of looking at several cases in depth. It is used as a guide rather than a strict test of ideas. It helps explore how managers understand the value of their knowledge and how they protect it in real-life situations. This matches the use of semi-structured interviews and comparing findings across different cases.

3.2. Research Design

3.2.1. Design

The study examined the use and implementation of KP methods within Australian SMEs. Based on the [literature review](#), it was identified that the adoption of KP methods was usually neglected by SMEs due to various reasons such as small size, lack of tools, and limited resources. However, as KP is an under-researched area, it is not evident whether the neglect of KP was also applicable to Australian SMEs. Therefore, this research helped the researcher gain a deeper understanding of the problem in the context of Australian SMEs.

A research paradigm is defined as the set of common beliefs and agreements shared between researchers about how problems should be understood and addressed (Kuhn 1970). It constitutes the beliefs and principles that define how a researcher sees the world and how he/she interprets the world. It is a conceptual lens that defines how the researcher will define his/her research and determine the methods to gather and analyse data. In research, paradigms are important because they define a researcher's philosophical orientation, which has important implications for every decision made in the research process including selection of methodology and methods (Kivunja 2017).

The researcher has adopted the interpretivist approach for the purpose of this study. The central endeavor of the interpretivist approach is to understand the research participants and interpret the research questions from their viewpoint rather than the viewpoint of the researcher. Then, the researcher attempts to derive constructs from the field through in-depth examination. The selection of the research approach depends on the nature of the study undertaken and the problem the research aims to address. The research philosophy is influenced by the researcher's background, experiences, and intended audience (Neuman 2011). The researcher adopted an interpretive paradigm based on the belief that reality could be discovered through the subjective experiences of individuals (in this case, research participants). Ontology refers to "the nature and existence of social reality" (Cecez-Kecmanovic & Kennan 2013, Table 5.1, p. 123). From an ontological perspective, this study views reality as socially constructed, dynamic, and delicate, emerging through individuals' experiences and the meanings they attribute to them. Epistemology concerns "the nature of knowledge and the ways of knowing" (Cecez-Kecmanovic & Kennan 2013, Table 5.1, p. 123). From an epistemological perspective, this study takes a practical orientation toward knowledge, seeking to gather comprehensive evidence about the phenomenon, the research process, and its context in order to deepen understanding of participants' lived experiences and the researchers' interpretations of them.

This study was an exploratory study as the area of KP is under-researched. Exploratory research is conducted when a problem is not clearly defined or understood and aims to gain insights, uncover patterns, and generate ideas for further investigation. It is particularly useful in the early stages of research, where the goal is not to test hypotheses but to explore a phenomenon in depth, identify key variables, and develop initial theoretical constructs (Hakim 2007). Rather than providing conclusive answers, exploratory research helps lay the groundwork for more structured inquiry by offering a deeper understanding of complex or under-researched issues.

Aligned with this approach, the interpretivist research paradigm emphasizes understanding the meanings that individuals or groups ascribe to social phenomena within their specific contexts. Unlike the positivist approach, which seeks to test existing theories through objective measurement, interpretivism is more concerned with generating new insights and building theory inductively from empirical data (Bryman 2016). This approach is particularly well-suited for exploring complex social processes where variables are not easily isolated or quantified. In this study, theory was developed through the creation of an initial conceptual framework, which is then refined in response to findings that emerge during the research process. This iterative development allows for a deeper understanding of the phenomenon.

3.2.2. Method

This study employed a **qualitative case study** methodology, using an **exploratory, multiple-case** design. Qualitative case study research enables an in-depth exploration of complex, context-dependent phenomena (Yin 2018). SMEs are quite different from large businesses in terms of structure, resource availability, and operational flexibility (Beck, Demircuc-Kunt & Levine 2005). Large businesses typically benefit from greater access to financial and human resources, well-established infrastructure, advanced technological tools, and standardized policies and procedures that support formalized operations (OECD 2017). By contrast, SMEs are typically unique and flexible in their operations, allowing them to adapt quickly to changing market conditions and customer needs (Denzin & Lincoln 2011). They mostly depend on the skills, experience, and characteristics of their owner-managers, who often play a central role in decision-making and strategic direction (Mintzberg 1979; Beaver 2002). Hence, when researching SMEs, it is important to work closely with their owner-managers and understand their viewpoints, as their personal values, motivations, and interpretations significantly shape the business and its practices (Curran & Blackburn 2001). In this investigation, the phenomenon of interest was the set of KP strategies employed by SMEs, which is intricate and context-bound to each organization. Knowledge is a complex term, and different organisations perceived knowledge differently. This often leads to variations in the implementation of KP practices. A qualitative case study is an approach to

research that facilitates the exploration of a phenomenon within its context (Denzin & Lincoln 2000). Hence, this approach was considered suitable for this study to gain an in-depth understanding of how KP strategies are perceived and implemented within the unique settings of Australian SMEs. Thus, the study used a case study approach involving Australian SMEs. A case study approach is well-suited because in this study it allowed examination of how and why SMEs protect knowledge within real-life contexts. As Yin (2014, p.13) notes, “case studies are the preferred strategy when ‘how’ or ‘why’ questions are being posed, when the investigator has little control over events, and when the focus is on a contemporary phenomenon within some real-life context”. This research aligns with this scenario and the approach allowed the researcher to compare and investigate the phenomenon of KP in different settings and to examine similarities and differences across cases. As this was an exploratory study, it aligned with Hakim's (2000) view that qualitative research is well suited for exploratory studies before they are developed into more complex and extensive research.

Each SME in the study was treated as an **individual case**, a bounded system comprising the firm and its KP practices. Studying 20 different SMEs constitutes a **multiple-case study** (sometimes called a collective case study), which strengthens the research by allowing cross-case comparisons and more robust theory building (Yin 2018). Examining multiple cases helps identify patterns that are consistent across different organizations as well as unique variations, thereby enhancing the potential generalizability (analytic generalization) of findings beyond a single case.

The exploratory nature of the research further justifies the case study approach. Exploratory studies are conducted when a phenomenon is not well-understood, and the goal is to discover insights rather than test specific hypotheses. A case study is appropriate for exploration because it is flexible and allows the researcher to delve into emergent issues. It provides rich qualitative insights into contextual factors and processes (Yin 2018), which is vital since KP strategies may be influenced by each firm's specific resources, culture, and environment. Further the interpretive paradigm and qualitative case study method enabled the researcher to understand the reality through the subjective experiences of individuals. Qualitative research was also seen as an approach involving direct observation and interaction with participants in their own language (Miller 1968). The data collected via the interviews was the primary data used for analysis and research findings but along with this some basic contextual information about each SME such as firm size, sector, and geographic location was collected through their online presence, such as registered websites and social media platforms. This demographic data helped in supporting the case descriptions but did not serve as an additional source of evidence regarding KP strategies or approaches. By

keeping the cases bounded and context-rich, the data was useful for interpreting *why* certain KP practices were chosen by each SME.

3.2.3. Data collection

The initial aim of the study was to conduct interviews in conjunction with document analysis where documents were provided by participating businesses (such as policy documents, and so forth). However, the study was predominantly conducted with face-to-face interviews as there were minimal examples of participants providing such documents as they SMEs mostly do not keep such documents. As it was an exploratory study, semi-structured interviews were well suited because they combine a guiding structure with flexibility. Semi-structured interviews allowed respondents to speak freely and let the conversation flow naturally (Hesse-Biber & Leavy 2011). Another reason for choosing semi-structured interviews was the flexibility to rephrase or change the order of questions as needed. This approach also enabled the researcher to ask probing or explanatory questions when deeper understanding and thorough answers were required (Minichiello 1995).

Knowledge is a broad term and hence different individuals/businesses can perceive it differently (Nonaka and Takeuchi 1995). KP strategies can also be viewed differently. It was very important to understand the research participants and interpret their viewpoints with regards to their understanding of knowledge of KP strategies. In this study, the semi-structured interviews were designed to elicit detailed qualitative data about how each SME protected its knowledge assets. This topic can be sensitive or abstract (since KP involves internal practices, some of which might not be formally documented), so an interview approach was appropriate to draw out tacit knowledge and personal perspectives. By using a semi-structured format, the interviewer had the freedom to ask follow-up questions or clarify responses, which is crucial given that KP strategies can vary widely and may not be initially articulated by participants without probing. To assist with standardising participant responses, they were provided with standard definitions of terms such as knowledge and KP at the commencement of each interview.

Interviews were mostly conducted with the owners or managers of the selected firms, except for a few situations where either the interview was conducted with the department manager or the director of the business. Where these occur, they are indicated in the case writeup in the Results section of the thesis. A copy of the interview questions (provided in [appendix two](#)) was provided to the selected participants via email prior to conducting the interviews so that can review the questions and can prepare themselves before the interview.

The researcher took notes during the interviews and later used them to create in depth summaries of the interviews in the form of transcripts. These transcripts were shared with

the interviewees to ensure the integrity of their responses. The interviews began with demographic questions to help put the respondents at ease. These were followed by more specific and targeted questions aimed at gathering in-depth data on the use of KP methods. Finally, the interviews concluded with open-ended questions, allowing respondents to comment on additional factors that could affect the implementation of KP methods in their enterprises.

Other common data collection methods, such as questionnaires and focus groups, were also considered but not selected. Questionnaires would not have allowed the researcher to ask probing or follow-up questions, and they were unsuitable for the mostly open-ended research questions (Gillham 2005). Focus groups were also not practical due to the difficulty of gathering participants at the same time (Creswell & Poth 2018). Additionally, the researcher planned to collect data from various suburbs, states and regional areas of Australia, which further hindered the feasibility of organising focus groups.

3.2.4. Research Participants

The sectors of real estate, construction, professional service providers, and health care providers were the top four highest contributors to Australian GDP at the time the study was commenced (ABS 2017). Hence, the researcher decided to select SMEs from these four sectors for the study. However, during the COVID pandemic it became very difficult to organise interviews with health care providers. So, this sector was replaced by the retail sector as it was identified that retail businesses had seen an increase in their contribution to GDP at the time (ABS 2022). Initially, the researcher used her personal contacts to arrange interviews with at least one business in each sector. This began with a phone call to the owner/manager of the selected SME within the identified industry sectors. To secure further interviews with other businesses, the researcher employed snowball sampling. In snowball sampling, a researcher begins by identifying a small number of initial participants who meet the study criteria (Biernacki & Waldorf 1981). These participants are then asked to refer others who also meet the criteria. The process continues until enough participants have been recruited or data saturation is reached (Biernacki & Waldorf 1981).

For the regional Australia interviews, the researcher had no initial contacts in the region. So, the researcher decided to visit a local community temple see if they could assist in providing some contacts. The approach is termed as referral sampling. As defined by Heckathorn (2002), referral sampling is a technique used to recruit participants from hard-to-reach or hidden populations by asking current participants (referred to as "seeds") to refer others they know who meet the study criteria. This process continues in waves, forming recruitment chains. It is especially useful when the target population is difficult to access through

conventional sampling methods. For this study, members of the local community temple were extremely helpful and provided contacts and referrals, which were then approached to recruit for the study. Most of the approached businesses agreed to participate in the study.

The initial aim of the research was to collect data from 30 SMEs. However, due to the richness and depth of the data gathered, the final number was reduced to 20 SMEs. This decision was guided by the principle of data saturation, the point at which no new themes or insights emerge from additional data collection (Guest, Bunce and Johnson, 2006).

3.3. Theoretical Framework: Resource-Based View (RBV)

The RBV theory of the firm is used as the theoretical lens for this study. RBV is a framework in strategic management that focuses on a firm's internal resources and capabilities as the key determinants of competitive advantage. According to Barney's formulation of RBV (1991), for a resource to confer sustained competitive advantage it should be valuable, rare, imperfectly imitable, and non-substitutable. RBV theory and its application to SMEs can be found in [Appendix one](#).

In the context of this research (and as outlined in the literature review), knowledge and know-how are critical strategic resources for many SMEs. Knowledge (including technical know-how, trade secrets, proprietary information, or unique processes) is typically an intangible asset that can give a firm a competitive edge. Such intangible resources are often immobile, they reside within the business and cannot be easily transferred or bought by competitors. Therefore, protecting valuable knowledge becomes crucial for firms to maintain their advantage. The use of RBV as an analytical and interpretive framework means that findings were interpreted for KP through the lens of resources and competitive advantage. During analysis, RBV provided a conceptual vocabulary to make sense of the data. One of the key aspects of RBV is that it examines criteria such as the value, rarity, and inimitability to determine their influence on developing competences and capabilities that can lead to competitive advantage. Rather than directly assessing whether SMEs' KP strategies aligned with the criteria, the study used the RBV as a lens to explore how firms mobilized their resources to develop the competences and capabilities necessary to implement KP strategies, which in turn shaped their competitive positioning.

On a few occasions the researcher was also able to examine whether the KP strategies described by SMEs aligned with the goal of preserving the value, rarity, and inimitability of their knowledge assets. For instance, some SMEs relied on formal IP rights (design rights, trademarks) to protect knowledge, which corresponds to formal legal mechanisms to prevent imitability. Others emphasized retaining key employees and preventing knowledge spill overs using informal methods. By applying RBV, the researcher was able to reflect on *why* those

mechanisms matter: for instance., retaining employees prevents valuable tacit knowledge from leaving the firm, thereby keeping that resource rare and immobile. RBV thus helped interpret whether SMEs view knowledge as a strategic asset and how that perception drives their protection methods.

3.3.1. Adoption of RBV

Several theoretical perspectives inform research on knowledge management (KM) and KP. Reviewing these provides a basis for understanding why the RBV is adopted in this study.

The knowledge-based view (KBV) is one of the most prominent perspectives, positioning knowledge particularly tacit and socially embedded know-how as the firm's most strategic asset and emphasising the organisational processes through which knowledge is created, integrated, and applied. While KBV aligns with Madhavan and Grover's (1998) depiction of firms as knowledge-creating entities, it is less suitable as a stand-alone basis for explaining sustained competitive advantage because it often under-specifies *which* knowledge is strategically significant and *why* it remains defensible against imitation or substitution. The resource-based view (RBV) strengthens this argument by providing explicit evaluative criteria valuable, rare, imperfectly imitable, and non-substitutable (VRIN) (Barney, 1991) to identify when knowledge can generate sustained rents and is therefore worthy of protection and investment.

Knowledge creation theory explains how firms generate and convert knowledge through social interaction and learning processes, highlighting the dynamic movement between tacit and explicit knowledge. While this perspective is valuable for understanding how new knowledge emerges within organisations, it does not provide a basis for distinguishing between ordinary knowledge and strategically important knowledge that can underpin sustained performance differences. In parallel, organisational learning theory emphasises how knowledge becomes embedded in routines, processes, and firm-specific practices over time. However, it largely focuses on adaptation and experiential learning, offering limited insight into why some embedded knowledge leads to durable competitive advantage while other forms remain easily replicable. The resource-based view (RBV) addresses these limitations by explicitly conceptualising knowledge as a strategic resource and by providing clear criteria such as value, rarity, and inimitability for identifying which intangible resources, such as technological know-how and firm-specific skills, can serve as enduring sources of competitive advantage (Wernerfelt, 1984; Eisenhardt & Martin, 2000).

For SMEs, RBV is useful because it accounts for resource heterogeneity and resource scarcity, which strongly influence how firms develop capabilities such as KP (Soto-Acosta & Merono-Cerdan 2008). SMEs limited financial, technological and human resources mean

that their competitive advantage often rests on a small number of unique knowledge assets or ICT capabilities that they must use carefully and protect effectively. Hence it serves as an excellent analytical lens for understanding how SMEs perceive the VRIN criteria of their knowledge resources, how they build capabilities to protect them and how these resources shape their competitive advantage.

3.4. Data Analysis

The interview process produced a large volume of data, so the next step involved data analysis, using a data reduction process to condense the extensive text into a manageable form (Miles, Huberman and Saldaña 2014). The purpose was to systematically interpret qualitative data gathered through interviews across 20 diverse SMEs to inform the refinement of a conceptual framework for KP adoption in SMEs.

3.4.1. Thematic Analysis procedure

Data was analysed using thematic analysis. Thematic analysis (TA) is a method for identifying and analysing patterns of meaning in a dataset (Braun & Clarke 2006). Interview transcripts were read and re-read to identify patterns and explore the use of KP strategies by different SMEs (Braun & Clarke 2006). Using a combination of **manual coding and spreadsheet tracking**, key phrases, patterns, and indicators were identified in each case (e.g., mentions of resource limitations, external IT support, awareness barriers). Codes were both: **Deductive**: Guided by constructs in the initial conceptual framework (e.g., “organisational size”, “resource constraints”) and **Inductive**: Derived from emerging insights (e.g., “trust in digital vendors”, “franchise influence”).

Key data were abstracted from the interview transcripts by dividing them into meaningful units and labelling them with descriptive terms (Glaser, 1992). Each interview transcript (a sample provided in [appendix seven](#)) was analysed using thematic analysis, guided by the framework method (Strauss & Corbin, 1998). To assist in developing initial themes for each case, an Excel-based analytical framework was constructed (provided in [Appendix six](#)). This framework was structured around key categories derived from the literature, such as organisational and other factors (e.g., sector, location, and age of business) and SME characteristics (e.g., size). Each row of the framework table captured these factors across individual cases, allowing within-case patterns to be identified through summarised thematic insights for each category.

Initial coding involved identifying the direct or indirect impact of each factor on adoption of KP strategies, based on interview narratives. These codes were entered into the Excel framework under each case, along with descriptive summaries and impact ratings (e.g.,

"Moderate impact," "Direct impact," "Unclear"). This process enabled a structured comparison of factors within each case. For example, Table 2 shows the cross-case analysis focused specifically on the Owner/Manager Characteristics factor, using one representative case study business from each industry sector.

Table 2: Cross case analysis example for all sectors based on owner/manager characteristics

Industry sector	Case study business	Owner/manager background & experience	Influence on KP adoption
Construction	METCON1	Owner/manager holds a formal qualification in Information Systems and has prior exposure to IT security concepts. Operates as both strategic and operational decision-maker.	Education and technical knowledge directly enabled adoption of multiple informal KP strategies (passwords, access controls, documentation). Formal KP deferred due to early business stage and cost.
Rental, Hiring & Real Estate	METREL1	Director has over 20 years of industry experience but no formal education in IT or KP. Relies heavily on experiential learning and industry norms.	Past experience shaped a conservative approach: reliance on informal controls (restricted access, cabinet locking, training) rather than formal IP protection. Director's attitude limits KP expansion.
Professional, Scientific & Technical Services	METPST1	Sole owner with approximately 15 years' experience in academia and education compliance consulting. High ethical orientation and professional responsibility.	Ethical values and professional experience drive rigorous informal and semi-formal KP (encryption, controlled sharing, contracts), despite micro-business size and absence of formal KP.
Retail & Wholesale	METRTL1	Three partners; two have formal IT qualifications and prior business training. Shared	IT skills enabled adoption of advanced informal/semi-formal KP (password protection, access

		managerial responsibility with clear functional separation.	control, digital watermarking). Lack of original design limits motivation for formal KP.
	Overall Impact	Moderate impact	Across all chosen sectors, owner/manager characteristics emerge as one of the decisive factors impacting knowledge protection adoption

The last row with overall impacts shows the summary of the results.

Following the within-case analysis, cross-case comparisons were performed by synthesising the overall summaries across all business sectors (Construction, Real Estate, Professional Services, and Retail/Wholesale). By examining how each factor influenced different cases within and across sectors, common patterns and divergences were identified. For example, "business size" consistently emerged as a key barrier to the adoption of KP across all sectors, while the "age of business" showed varying levels of impact depending on the maturity and growth of the business. This supported in the cross-case analysis of the data gathered and then the data was further analysed using the lens of the RBV theory.

Although the project generated a substantial amount of qualitative data, the level of analysis required was not complex enough to require the use of specialised software such as NVivo. The responses were manageable using Excel spreadsheets and direct review of the interview transcripts.

3.5. Ethical Considerations

Given that this research involved human participants (SME owners/managers discussing their business practices), several ethical considerations were paramount. The study was designed and conducted in accordance with the university's human research ethics guidelines and general principles of research ethics. Prior to data collection, the research proposal, research questions, consent form and the information sheet were submitted to Victoria University's Ethics Committee for review. Full ethical approval was obtained provided in [appendix five](#), confirming that the study protocols met requirements for safeguarding participants' rights and well-being. The approval process ensured that the questions and procedures were appropriate and minimized any potential risk to participants. All interviews were conducted only after this ethics clearance was in place (HRE18-108).

The study mainly required human interaction via interviews and on rare occasions to cross check some demographic information about the business via their online presence such as websites, social media accounts etc., but it was still considered a low-risk study because the participants were adult professionals who were being asked business-related questions. The study did not involve children, people with disabilities, or other vulnerable groups. Hence, it was classified as a low-risk study.

Consent forms ([appendix four](#)), information sheets ([appendix three](#)), and a copy of the research questions([appendix two](#)) were provided to the research participants prior to conducting any interviews. These documents were collected at the commencement of each interview. Participants were made aware that their participation was entirely voluntary and that they could withdraw at any stage. They were also informed that their privacy would be maintained at all times to encourage open and honest responses.

The methods outlined in this chapter provided the basis for systematically collecting data across multiple SMEs. The following chapter presents the results of this process, structured by individual case studies and the key factors influencing KP adoption.

Chapter Four: Results

4.1. Introduction

The industries selected for the research were Rental, hiring and real estate; Construction; Professional, scientific, and technical services and Retail. which are amongst the top contributors towards industry value added to Australian GDP. This chapter will present the data gathered from SMEs in Melbourne city and regional Australia.

4.2. Overview of cases

The initial aim was to select companies uniformly across the chosen industry sectors. Table 3 presents a summary of all business case studies selected for this study, organized by industry sector and geographical location. A total of 20 case studies were conducted across Metropolitan and Regional Australia, including 16 from the Melbourne metropolitan area and 4 from regional Shepperton. The case studies span four industry sectors: Construction (4 cases), Real Estate (6), Professional Services (5), and Retail (5), providing a diverse representation across urban and regional contexts.

Table 3: Distribution of Business case studies

Industry sector	Location		Total
	Metropolitan Australia (Melbourne)	Regional Australia (Shepperton)	Metropolitan And Regional Australia
Construction	4	-	4
Real Estate	4	2	6
Professional Services	4	1	5
Retail	4	1	5
TOTAL	16	4	20

Construction and Professional, Scientific, and Technical Services primarily provide personalised services that is, services tailored to meet the specific needs and preferences of individual clients. For example, in the construction industry, clients often visit display homes and then request builders to customise designs based on their budget, lifestyle, and aesthetic preferences. Similarly, professional service providers such as financial planners offer strategies that are unique to each client, taking into account factors like income, expenses, age, and financial goals.

In contrast, Real Estate Services generally involve the buying, selling, and leasing of properties, where the services are less customised. Properties are typically bought and sold

in their existing condition, and the service provided is more transactional in nature rather than tailored to individual preferences.

In this research, business codes are used to systematically identify case study businesses based on their location, industry sector, and sequence. The codes begin with a location prefix: MET for metropolitan cities, REG for regional cities, and MID for midsize cities. This is followed by a three-letter industry code: CON for construction, REL for rental, hiring, and real estate services, PST for professional, scientific, and technical services, and RTL for retail. A numerical suffix is added at the end to indicate the sequence number of the case study within that category. For example, METCON1 refers to the first construction business in a metropolitan city, REGREL1 indicates the first real estate business in a regional city, and MIDREL2 refers to the second real estate business in a midsize city. This coding system ensures clear and consistent referencing of businesses throughout the study.

Originally the study had planned to conduct research in metropolitan, regional and mid-size cities such as Brisbane. However, after presenting at a conference and based on the feedback received it has been decided not to conduct interviews in the mid-sized cities as they had few differences from the metropolitan Melbourne.

In addition, it was initially planned to conduct the non-metropolitan interviews in the regional City of Geelong (Australia's largest regional city). However, after further consideration the regional area was changed from Geelong to the town of Shepperton. It was decided that Geelong, given its size (Population: 276,446) has too many characteristics that make it similar to Melbourne. With a population of 68,874, Shepperton is a smaller town, located some 180 kilometers (approximately a 90-minute drive) North of Melbourne.

The regional interviews were conducted to assess if geographic location of the business (one of the factors listed in the theoretical framework) impacts the adoption of KP strategies. There were four interviews conducted in the regional area. In addition, the interviews that were conducted pre-COVID were followed up to identify if COVID had any impacts on the adoption of KP strategies.

Table 4: Details of Business case studies

Seq no.	Business Code	Employee number	Number of departments	Type of Services	Age (in years)
1	METCON1	4	3	Multi-Unit Development, Knock Down and Rebuild residential and commercial buildings	1.5
2	METCON2	4	4	Multi-Unit Development, Knock Down and Rebuild single and double story buildings	1.5

3	METCON3	19	7	Multi-Unit Development, Knock Down and Rebuild projects, Home & Land Packages and financial assistance	9
4	METCON4	150	9	Multi-Unit Development, Knock Down and Rebuild projects, Home & Land Packages, financial assistance, plumbing and electrical instalments.	36
5	METREL1	50	8	Renting, selling, buying, financial assistance and property management assistance	20
6	METREL2	3	2	Selling and buying	1
7	METREL3	50	9	Renting, selling, buying, financial assistance and property management assistance	5
8	METREL4	4	4	Renting and selling of residential properties only	6
9	REGREL1	21	4	Selling development lands for future homes, commercial, industrial properties	5
10	METPST1	1	0	Compliance services	4
11	METPST2	6	3	IT designs and applications	7
12	METPST3	3	4	Financial services	20
13	METPST4	14	4	Financial planning services	29
14	REGPST1	3	3	Accounting, Taxation and Business consultancy	4
15	METRTL1	4	4	Floor coverings, furniture and houseware	5
16	METRTL2	3	3	Watch spare parts, watch repairs, watch accessories and watch servicing	15
17	METRTL3	3	2	Grocery and convenience store, selling grocery products, money transfers etc.	6
18	METRTL4	8	4	Curtains, blinds and shutters	6
19	REGRTL1	7	4	Rubber store, selling rubber products, pools, foams and consultancy service	5
20	REGRTL2	4	2	Grocery and convenience store, selling grocery products, money transfers etc.	12

Whilst gathering data it was identified that SMEs do not clearly differentiate between the term information and knowledge, even though their definitions were provided at the start of interviews. Most of the time when questions were asked about KP, they were answered with examples mostly concentrated on information protection rather than KP. It could be because most of the knowledge in practice is derived from documented information, making it easier to focus on information protection. Additionally, KP often involves more complex, context-dependent, and tacit elements that are harder to capture, measure, and manage compared to structured information. The results of the study are now presented, divided into industry sector. Table 4 provides a brief overview of all businesses selected for the study.

4.3. Construction

The first industry sector selected by the researcher was Construction. The construction industry is one of the highest contributors towards Australian GDP. It is Australia's third largest producing sector with around 8% of Australian Gross Domestic Product (GDP). Nationwide, the construction industry comprises around 330,000 businesses employing nearly one million people. The industry operates in both public and private sectors. There are three main areas in construction: engineering construction, non-residential building, and residential building. Engineering construction is the sector of the construction industry which is mainly concerned with the design and delivery of industrial plants like oil and gas industries, manufacturing industries etc. Non-residential buildings on the other hand means any commercial, industrial, institutional, public, or other building, which is not occupied as dwelling such as hotels, educational buildings etc. Residential building means any building which provides more than half of its floor area for dwelling purposes. They may or may not include cooking facilities. Some examples are houses, lodging rooms and apartments. The main factors behind the increased demand within the construction industry are population growth, income growth, industry activity, technology changes, commodity cycles, consumer sentiment, interest rates and inflation. Government policies affecting residential building, pricing, and infrastructure development, which also has an impact on the growth of the construction industry (AiGroup 2015). Government incentives and rebates encourage first home buyers to construct their houses as the percentage of rebate provided is higher than when buying an existing house.

In addition to direct construction activities, the construction industry plays a vital supporting role for many other sectors by providing essential infrastructure such as factories, office buildings, and commercial spaces. These supported industries include Manufacturing; Rental, Hiring, and Real Estate Services; Accommodation; Electricity, Gas, Water, and Waste Services; as well as Professional and Financial Services.

In 2014, the total value of the Australian construction industry was \$204.5 billion. Among these, Engineering constructions (56.1%) was at the top followed by residential (26.6%) and non-residential building (17.2%). The construction industry is mostly comprised of small businesses (98.6%). Nearly 60% of construction business are sole operators with no employees. This is because of the traditional structure of sub-contractors and trade specializations. Hiring subcontractors is very cost efficient for SMEs rather than hiring full time employees. Along with this they also offer superior service and expertise as they have been working in the field for several years. Some 1.3% of Australian construction businesses are medium sized businesses and large businesses account for 0.1%. In 2013-14 more than

two million of revenue was generated only from 5.9% of construction businesses (AiGroup 2015). Hence, it was worthwhile to include this sector in this research study.

Table 5. shows the distribution of businesses by employment size in the construction industry. It is evident that SMEs outnumber large business in this sector. Almost 99.9% of business share is provided by SMEs.

Table 5: Distribution of businesses by employment size in Construction industry

Employee range	Number of businesses	Share of businesses (%)
Non- employing (small)	201,785	60.0
1-19 (small)	131,546	38.6
20-199 (medium)	4,698	1.3
200+ (large)	197	0.1
Total	338,226	100

(ABS 2014, Table 2, P. 6)

The construction industry is also the third largest employing industry in Australia. The largest segment in the sector is Building installation services which employed 232,700 workers, followed by building completion services with 192,400 employees, residential building construction (100,900) and other construction services with 98,900 employees (Scutt 2018).

The Researcher interviewed four companies from this sector. Two firms were medium sized businesses and the other two were small businesses. As Table 6. shows, the small businesses were quite new in the market whereas the medium organisations had been in operation between nine and 35 years. There is a difference in the employee numbers across the businesses. as well with firm A comprising only 3 employees and firm D with 150 employees and is a large medium sized company.

Each of the construction cases will now be discussed.

Table 6: Detail of Construction sector cases

Business code	Construction Industry			Age (in years)
	Employee number	Number of departments	Type of Services	
METCON1	4	3	Multi-Unit Development, Knock Down and Rebuild residential and commercial buildings	1.5
METCON2	4	4	Multi-Unit Development, Knock Down and Rebuild single and double story buildings	1.5
METCON3	19	7	Multi-Unit Development, Knock Down and Rebuild projects, Home & Land Packages and financial assistance	9
METCON4	150	9	Multi-Unit Development, Knock Down and Rebuild projects, Home & Land	36

			Packages, financial assistance, plumbing and electrical instalments.	
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4.3.1. Case METCON1

4.3.1.1. *General description*

Case METCON1 is a micro business. The business has three employees across three departments (administration, accounts and purchasing). Most of the construction work is subcontracted. The manager/owner of the business participated in the interview. The interview was conducted at the researcher's home as the interviewee is a personal contact. The interview went for almost 45 minutes but as the interviewee is a family friend and there was some further, informal discussion over dinner. The setting of the interview enabled a free form of discussion and flow of information.

The types of services provided by the METCON1 are multi-unit development, knock down and rebuild residential and commercial buildings. *Multi-unit development* means building more than one dwelling on a single lot, for example units, duplex, triplex, townhouses, and apartment buildings. *Knock down rebuild* involves pulling down an existing house and using the land to build a brand-new house. Along with this the firm also builds new houses (from land preparation to building construction). At the time of the interview the organisation was quite new in the market, having been in operation for just one and half years. Most of the construction to that time had involved *residential construction* (under class 1A and 10) and some commercial construction services. Class 1A refers to a single dwelling (such as row houses, terrace houses, town houses or villa units). Class 10 implies a non-habitable building or structure such as a private garage, swimming pool or a bushfire shelter (QBCC 2020). Under residential construction the firm undertakes houses and multiunit single and double story homes. The business also provides 'custom' builds. The findings for the case are now presented, arranged according to the research framework.

4.3.1.2. *SME characteristics*

4.3.1.2.1. *Business size*

Due to their size, METCON1 preferred to implement informal protection mechanisms over formal methods as informal methods do not require large investments and training. The manager commented that "we do not need extra money to put a password on our computer and it's something we can do ourselves". The business also did not have any IT department dedicated for such implementations. These strategies are performed on a regular basis and are embedded in their business practices. Because of their small size and profits the business cannot invest in extensive formal KP methods. However, the business does

possess critical information which must be protected. For example, “I don’t want my competitors to know at what price we are providing our services to customers or what price we are getting services from our service providers and suppliers.”

Having a limited number of employees requires strong confidential relationships between them. The two reasons behind this are: firstly, SMEs are required to share information across departments for seamless operations and secondly, because the employees are required to cover a wider range of tasks. The manager strongly believes that he maintains healthy trustworthy relationships with his employees so that they feel a part of the business and therefore look after their important assets.

4.3.1.2.2. Owner/manager characteristics

The manager had a degree in information systems, and he has studied about the layers of protection that can be implemented to protect organisation knowledge. This enabled him to implement some of the KP methods himself. His education and experience enabled him to identify the KP strategies that will provide the needed protection required by the business.

4.3.1.2.3. Flexibility

Being a micro business, METCON1 services a niche market. The flexibility offered by their small size played an important role in the adoption of KP strategies. As the firm has only four employees the introduction and adoption of new strategies was an easy process. Thus, their smaller size did make it easier to introduce new KP strategies. The business only had a few KP strategies in use to protect their organizational knowledge. With the expansion of their business, they could investigate other methods to be adopted. As the manager said, “We can adopt new KP strategies as the demand arises. As yet we are comfortable with what we have.”

4.3.1.2.4. Relationships

METCON1 works closely with other SMEs in construction and aligned sectors (such as plumbing and painters), as well as with the suppliers of their raw materials. As they are relatively new to the market and still establishing their business, they also hire services from external SMEs. To build rapport and trustworthy relationships they are required to share some of their organisational knowledge with their suppliers and collaborators. While sharing knowledge the company pays specific attention to the amount and specificity of the information that is shared. The manager confirmed that he keeps some details to himself while only disclosing the required information to suppliers and collaborators. For instance, the manager noted that “external companies do not require access to detailed cost estimations.”

4.3.1.3. Organisation and other factors

4.3.1.3.1. Sector

METCON1 were looking to expand their business, so they wanted to build strong connections with their clients by meeting their expectations and needs. Hence, they allowed their clients to provide their requirements in the form of customised designs. A *custom design build* is a process where clients provide their specifications, and the construction business uses architectural designs to capture those requirements. Clients provide detailed specifications for their proposed project and the business develops customized design blueprints in the form of architectural drawings. The custom design build is an all-inclusive process that covers all phases of a project – including design, construction, and financing. This requires constant communication, organization, and time management to develop plans for a project that flows smoothly and efficiently – on time, on target, and on budget. However, sometimes clients decide not to go ahead with the construction once they have been provided with a quote. However, the business' designs and quotes have already been provided ('leaked') to the client. This problem is specific to this industry sector.

In addition, the business provides customised residential building construction or construction based on existing in demand models. They build models of proposed developments in conjunction with their client requirements. As the business is not developing or creating unique plans or models, these models are not protected by formal KP methods. The manager believes that they still require some sort of KP, so the business relies on other informal means of protection such as authorization, authentication, cabinet locking, confidentiality, and trustworthy internal and external relationships (described later). Mostly the models are protected with authentication and cabinet locking strategies. He again noted that informal ways of protection do not require large investments and training. These strategies are something which was performed on a regular basis and is embedded in their business practices.

At they are in the construction sector, the manager of METCON1 thinks that they cannot protect knowledge completely as knowledge leakage (as just described), the concept of display homes, online galleries on websites, and social networking makes some of their information publicly available. People can click on or download pictures and potentially access ideas about interior design. Even though it is just information, which is accessible via static images, knowledge acquisition also depends on the capability of the competitors. Competitors in the sector know exactly how to capture and bring that external knowledge with respect to their organisational context. For example, if a blueprint of a construction

building is available online then anyone with engineering skills can understand the drawing details and come up with their own version of the design.

As the business is mainly a custom design builder, when clients bring a design from another business then METCON1 takes a written agreement from their client to protect against lawsuits (for example IP theft). Another strategy to protect the business from any legal action is to change the designs by 20% if they match with other business designs.

4.3.1.3.2. Location

METCON1 is a metropolitan based organisation and they do not have any non-metropolitan branches, so they are not affected by being in rural or remote locations. The business solely depends on IT service providers to look after their systems but being situated in a Metropolitan region means that it is easy to access these services.

4.3.1.3.3. Age of business (years)

Although not listed in the framework, the *age of the business* emerged from the data collection as having a major impact on the adoption of KP strategies, so was included in interview questions at an early stage. The manager was asked whether their approach to KP differed for the business' core activities, as against non-core activities. METCON1 is quite new in the market so their major focus is initially on establishing the business and strengthening their core activities. At the early stage of their growth, the business focus is to establish their 'roots' in the market and increase their customer base to make some revenue so they can think of investing in other required strategies like KP. The manager commented that "we are too young to worry about any non-core business processes yet, at this stage our main focus to extend our market share." Thus, the age of the business meant they were just concentrating upon KP strategies for core activities initially.

4.3.1.4. Knowledge Protection Strategies

The manager suggested that the business can protect their explicit knowledge by implementing protection mechanisms such as passwords and having restricted access to documents. METCON1 uses a variety of informal protection methods like secrecy, restricted access and contracts and documentation to do this. The manager noted that informal methods of protection do not require large investments and training. These strategies are something which were performed on a regular basis and were eventually embedded in their business practices. The manager's educational background meant that he had studied about the layers of protection that can be implemented to protect organisation knowledge. Hence, he believes that it is more effective to protect knowledge at different levels then spending money on expensive protection strategies. For example, rather than applying for IP or a

trademark, it is more economical to put a lock and a password. For example, if you have an Excel spreadsheet file which contains important information then that information can be saved on a laptop which is password protected. The file should be made available with different privileges, and further locks and validation rules can be placed on the data sheets.

The business had not invested in specific KP strategies to manage tacit knowledge. However, contracts and documentation contributed towards KP. If any employee comes up with new ideas and plans, they are requested to transfer their ideas into documentation. No specific format is used for documentation, so employees can create a simple text file or spreadsheet. With this approach, tacit knowledge is converted into explicit knowledge which can be protected using other informal ways of protection. For example, an employee who has come up with a new, more efficient way to perform their customer analysis could be asked to document their idea onto paper. If the idea gets approved and is adopted by the business, then it will become the property of the business and can be protected with either formal or informal protection mechanisms such as copyright, authorization and/or cabinet locking.

The knowledge within the business is protected using different access privileges, restricted access, fragmentation of work and cabinet locking. When knowledge is shared with other businesses in the sector, suppliers, or subcontractors then strategies such as authentication, authorisation, and division of work are implemented. All these informal strategies ensure the protection of knowledge and help to inhibit knowledge leakage.

The business also relies on the Victorian Building Authority (VBA) and Victorian Civil and Administrative Tribunal (VCAT) to deal with disputes and complaints with suppliers, partners, and customers. The VBA can deal with complaints relating to breaches and offences of legislation such as the Building Act 1993, the Building Regulations 2018, and the Plumbing Regulations 2018.¹ VCAT provides justice to the Victorian community. They handle cases such as planning disputes, Owners corporations' disputes and Domestic or commercial building disputes between a property owner, builder, sub-contractor, architect, engineer, or other building practitioners.²

The business struggles to protect their tacit knowledge when employees leave and join other businesses. They do not have any specific strategy in place to deal with this.

4.3.1.5. Summary

The main KP strategies implemented by METCON1 are informal protection mechanisms such as secrecy, restricted access, and contracts & documentation. It was evident from the Manager's responses that the implemented protection strategies are directly impacted by the smaller size and revenues of the business. Formal protection methods require investments and long processing times which is a constraint for this business. It can also be said that the

industry sector greatly impacts the selection of protection methods. METCON1 thought the construction sector operates like an open business where ideas are easy to access and copy. The age of the business also has its role in the implementation of KP strategies. The new business concentrated more on expanding their business by sharing information rather than protecting knowledge.

The manager believes that both formal and informal ways of protection are important to protect knowledge spill overs and attain competitive advantage. However, being a business of small size and limited turnover, they had been restricted to adopt informal methods. The business certainly requires KP for growth, but at this early age their focus is to establish themselves and make better use of their revenue. Once the business starts innovating new ideas and plans, they plan to invest in more formal and stronger protection strategies. In future the business will require copyrights to protect their designs especially handwritten custom designs.

4.3.1.6. Knowledge Protections Benefits

Based on the data gathered there is not much evidence that implementation of informal protection methods by METCON1 reaped them any benefits. This is mostly because they are not focusing much on KP strategies. The business does not have any formal method to measure the success of KP strategies. According to the business owner, the KP strategy can be measured by the successful and continues client retention of the business.

4.3.1.7. Impact of COVID19 on KP adoption

As the COVID 19 pandemic happened during the research it was worthwhile to identify if it had any impact on the adoption of KP strategies by the selected SMEs. METCON1 have subsequently identified that the pandemic did not have any significant effect on their KP strategies. The business continued the adoption and utilization of same protection strategies as before. Although, COVID did impact the nature of some of the business processes. METCON1 moved to virtual tours and online meetings with clients for design discussions. Their work was restricted to critical and essential infrastructure and services to support the projects under construction and critical repairs. In addition, the industry was under the restriction of number of workers allowed at a construction site depending on the scale of construction.

4.3.2. Case METCON2

4.3.2.1. General description

METCON2 was another micro business from the construction industry. This company has four employees across four departments (administration, accounts, sales and purchase). It

is a young firm, only being in business for the previous one and a half years. The business mostly organizes several subcontractors to manage the contracted construction work. The main reason behind this level of subcontracting is to reap the benefits of specialised skill sets not possessed by existing employees. Their work requires a varied range of capabilities that is too diverse to be carried out by a single general contractor.

The interview was held with the manager of the business at the home of the researcher. The interview went for almost 40 minutes. The business was selected using the convenience sampling through personal contacts.

The main services provided by the business are multi-unit development, knock down and rebuild single and double story buildings. However, most of their clientele is in new residential buildings under class 1A and 10. The business also provides renovation services, but it is not a preferred service as renovation requires another level of expertise which young companies lack. The business is situated in the western suburbs of Melbourne and recently multiple new estates had been developed in those areas. The sudden increase in construction demand has provided extra work for the business. The details of the findings for METCON2 are presented below.

The firm uses a mix of semi-formal and informal methods which are secrecy, restricted access and contracts and documentation.

4.3.2.2. SME characteristics

4.3.2.2.1. Business size

METCON2 is a micro business with just four employees and thus has limited resources. The business's IT services are outsourced due to its small size and limited resources. Thus, the rate of usage of protection methods is quite low, especially usage of formal protection methods. The manager stated that "at this stage, we are financially not capable to utilize our resources for non-core business activities." The owner/manager of the firm believed that it is more important for him to establish his business first rather than focusing on the implementation of KP strategies. More importantly, most of the important organisational knowledge stays with the manager with limited access available to other employees. Only the manager knows where and how to use that knowledge. The employees are instructed to perform their roles and responsibilities without accessing the underlying organisational knowledge. The Interviewee believes that both formal and informal ways of protection are important to protect knowledge leakage and attain competitive advantage, but their small size and limited turnover has restricted to informal ways only.

4.3.2.2.2. Owner/manager characteristics

Most of the business decisions are made by the manager of the company because of the small size and lack of hierarchical organisation structure. The manager of the business did not know much about the implementation of formal methods that he could use to protect company's knowledge assets. He knows what they are but is not aware how they could be acquired and implemented. Before his business, the manager used to work for another construction company. His previous employer did not have any formal KP mechanisms in place, but all informal processes were considered an integral part of business processes. Based on his experience the manager believes that the early years of business can survive without focusing too much on the use and implementation of protection mechanisms.

4.3.2.2.3. Flexibility

The small size and adoption of subcontracting provides much higher flexibility to METCON2 as compared to large competing businesses. The business' flexible structure directly impacts its ability to adopt new business strategies including KP strategies. The manager of METCON2 said that, "I agree the company certainly requires KP for growth, but we must push the idea to the back of our mind because at this early age our focus is to establish ourselves and make better use of the revenues." He further added that "the simple organisational structure enables easy adoption of new strategies, so if the need arises, we will start looking into KP strategies more seriously."

4.3.2.2.4. Relationships

METCON2's manager believes in sharing knowledge with other businesses in the sector where appropriate, even competitors as exchanging knowledge enables them to create new knowledge. For instance, businesses in the sector rely on sub-contractors to complete their contracted work and often they use the same subcontractors. The two businesses exchange subcontractor details with each other, which is convenient, but does impose the potential risk of knowledge leakage. Subcontractors have access to the project knowledge, which may lead to intentional or unintentional knowledge leakage as they work different projects. There is a level of trust between competitors and the manager stated, "that trust is something we highly rely on." The manager of METCON2 suggested that as a new business manager he shares his ideas and knowledge with his competitors because he has a lot to learn and know about the "business ins and outs". The manager has commented that all construction projects are unique and temporary, but it is valuable to collect information about events, consequences and the steps taken. All the collected information can then be used in subsequent projects. For the businesses that are young and have worked on only a few projects, knowledge sharing can help them to learn more about different project needs. For

example, METCON1 has developed a luxury home but METCON2 had not worked on such a project. The two managers discussed the things that METCON2 could take advantage of while working on a such a big project.

4.3.2.3. Organisation and other factors

4.3.2.3.1. Sector

As METCON2 is a relatively new business in the construction industry, most of their work is in building residential buildings. The business usually deals in construction based on existing 'in demand' models borrowed from other businesses. Every construction industry publishes their designs online and other business can get inspiration and develop their own display properties from these. When clients approach the business with a particular design they like, the business suggests the changes and add-ons that can be added to the selected design. As the ideas are borrowed from existing market designs, they do not need to invest in formal protection methods. Another reason for not extensively using protection methods is their provision of customised designs for clients. Some clients bring them designs and they are only responsible for the construction. If METCON2 wants to use the pictures of the finished work for marketing on social media, they must get written consent from their clients. The owner of the business believed that the availability of finished work pictures on social media is not a source of knowledge leakage. As the pictures are very abstract, they do not give away any confidential information. The manager of the business thought that construction businesses are mostly open with regards to construction designs and layouts and that they are difficult to protect. In today's digital era, everything is available online and is easily accessible to the public. He commented that, "The type of information that could be protected is about their expenditures, sales and profit margins and this information could be easily kept in a safe place without requiring any formal protection method."

Moreover, SMEs like METCON2 use their contacts to organise their supplies and they said they must trust their partners to build their business. Building trustworthy relationships require knowledge sharing and strict protection methods can impact their knowledge sharing capability. They may sometimes also impact their relationships with their partners.

4.3.2.3.2. Location

METCON2 is a Melbourne based business, mostly operating in the metropolitan areas. The manager does not believe that the physical location of the business has any impact on the implementation of KP strategies. The current adopted KP methods can be either implemented remotely (like file privileges) or can be building specific (such as cabinet locking). These are not location specific. Hence, the owner of the business commented that,

“I believe that the adoption of KP strategies depends more on the business needs and resources rather than its geographic location.”

4.3.2.3.3. Age of business (years)

The young age of the business certainly has an impact on the adoption of KP strategies. The owner stated that, “As said earlier, I agree that the age of the business impacts the adoption of KP strategies. At the stage its more important for the business to establish itself by focusing on core business processes. It is not economical for us to spend our resources somewhere else.”

4.3.2.4. Knowledge Protection Strategies

METCON2 has only invested in informal protection methods, and they also use semi-formal protection methods like restricted access. The manager’s knowledge about informal protection methods gave him the assurance that implementing semi-formal and informal methods is sufficient at the stage.

The storage of confidential data is mainly in the manager’s personal laptop and all hard copy documents are stored at business’s head office. The digital data held in laptops is password protected, and the documents are secured in locked cabinets. Knowledge sharing requirements of the business are secured with authorization and fragmentation of work. The owner of the business stated that, “the shared documents are mostly provided with read only rights, spreadsheet data is protected with data validation and locking mechanisms provided within the software’s’.” Hence, the business does not see the need of any formal protection mechanisms yet. The business uses informal methods as they are more like daily operational requirements rather than a rigid protection mechanism. Methods like passwords, user privileges, and fragmentation of work usually do not impact collaborations and partnerships.

METCON2 has nothing in place to protect their tacit knowledge, and they said, “there is nothing we could do about it at the moment.” However, the business does rely on the Victorian Building Authority (VBA) and Victorian Civil and Administrative Tribunal (VCAT) to deal with disputes with suppliers, partners, and customers.

4.3.2.5. Summary

Based on the data collected it is evident that METCON2 generally invest in the implementation of informal and semi-formal protection mechanisms. The most common strategies that have been used to protect inter-organisation and intra-organisation knowledge leakage are authentication, authorization, secrecy restricted access and fragmented division of work. The manager of the business believes that at the present stage the business need

not invest in any more strict and expensive protection mechanisms. The business' knowledge is protected well with the adopted strategies.

The manager agrees that formal protection methods will provide an extra layer of protection to his business, but it is something they would worry about in the near future. At present the business needed to focus more on utilizing the profits to attain market share and build relationships with their partners, suppliers, and collaborators. As the business has nothing substantial in place to protect their tacit knowledge, they are planning to eventually do something about it rather than just relying on VBA and VCAT.

4.3.2.6. Knowledge Protections Benefits

From the gathered data and participant's responses it is not evident that the business has gained any benefit from the implementation of the selected protection methods. The business did not use any formal measure to estimate the success of protection strategies. At present, informal methods embedded into their daily business routines are more than enough to keep their information protected. And the use of KP strategies is only to protect their business knowledge. After the interview, the manager of the business said, "I think we should better start focusing on it now." The business relies on the feeling that the continuous extension of business and customer attention is an indicator of KP success.

4.3.2.6.1. Impact of COVID19 on KP adoption

METCON2 did not change or amend their KP strategies in response of COVID19. The business relied on the same informal and semiformal protection methods as pre-COVID. The owner of the business mentioned, "The business is vastly impacted by COVID but nothing changed in regard to protection strategies." Some of the business processes were conducted online during [the] COVID period and the existing protection methods could maintain the integrity and privacy of organisational knowledge. Within complete lock down periods all display homes were closed which forced the business to provide virtual tours to their clients. When it came to colour, material and façade selections, the clients sent samples online where they had to make their final decisions regarding the material selection.

4.3.3. Case METCON3

4.3.3.1. General description

The third business selected for the research was another construction business which fits the small and medium sized business category, with ten departments and around 20 employees. Their main departments are sales, accounts, building coordination, estimating, construction, design, maintenance, administration, finance, and project management. METCON3 is a well-established business with nine years in operation. The business has a

web presence which enables their customers to find out about them. The interview was held at the business's office with the owner/manager and lasted approximately 45 minutes. Some follow up questions were asked informally after the main interview (over a coffee) to obtain a clearer picture of business use of KP.

The main types of services provided by the business are multi-unit developments, knock down and rebuild projects, and house & land packages (supported by financial assistance). Generally, most new houses are built by property developers. METCON3 operate in a similar manner, buying land when it is released by the government, building homes, and selling them as a complete house and land package. The business also provides financial assistance for customers. They assist their clients to establish trusted partnerships with legal advisors and financial institutions to make obtaining a home loan easier for them. This is a free service, provided to make the entire project of building a new home easier.

The business has brought thousands of architectural designs to their clients during their operation. The business uses their key design as a base and then tailors this according to customer requirements. They then add the requested changes in their list of design suggestions. The manager suggested that they would likely be described by the industry sector as offering 'premium home building and development packages' as their vision is to provide luxury home-building and development services. The level of market competition makes KP mandatory. Therefore, the manager believes that the business should be ready to adopt new protection mechanisms when required. Every business strives to produce unique ideas and designs, and it is important to protect those ideas from leakage for innovation. The business also needs to prevent the loss of key information to their competitors. He compared the construction business to the ocean, with layers of information. It takes time and experience to peel those layers back and understand how and where to invest their money. With years of experience, the business has learned how to deal with different clients. When clients approach the business with their construction requirements, they are provided with an initial construction estimate based on their requirements. After initial budgeting, add on suggestions are provided, which vary from client to client, and this is something that is learnt over time and experience. As a result, profit margins also vary. The business can identify the clients who are clear about their requirements and have come prepared after doing their research. In such cases, profit margins are lower as compared to dealing with clients who have no knowledge or time to do their research. When a client heavily relies on the business, this is reflected in their charges/fees.

The adoption and implementation of KP strategies is presented below according to the research framework.

4.3.3.2. SME characteristics

4.3.3.2.1. Business size

METCON3 have a well-established market. However, the business still belongs to the lower range of SMEs in terms of the number of employees. The manager strongly believes in the protection of organisation knowledge, but at the same time their limited resources (due to their size) inhibit them from the use and adoption of patents and trademark KP strategies. The process of acquiring formal protection methods is lengthy and costly which is why SMEs cannot afford them.

4.3.3.2.2. Owner/manager characteristics

The manager of the business is responsible for its daily routine operations. The business does not have an explicit knowledge manager and IT services are mostly outsourced. The manager identifies the business needs and requirements based on his experience. These business needs are mapped into system requirements and constraints for the hardware and software used by the business to perform their business processes and operations.

The manager of METCON3 always belonged to a business family. He started working with his father from a very young age and has learned from experience. He worked and invested in a few different businesses over his career. This involvement in businesses across the industry sector enabled him to use his knowledge and experience in identifying, selecting and implementing protection strategies successfully.

4.3.3.2.3. Flexibility

Even though the business is a mid-size company, they do not have the flexibility of smaller businesses due to their limited resources (as indicated earlier). The flexibility provided by the smaller size of the business allows them to provide varying quotations to their clients.

The smaller size of the business enables them to adopt varying business policies across their client base. The smaller size and the business manager being solely responsible for making major business decisions, enables METCON3 to introduce and adopt varied protection strategies.

4.3.3.2.4. Relationships

METCON3 uses sub-contractors to complete their projects. The extent of sub-contracts depends on client requirements. Typical examples of sub-contractor tasks are: concreting, plastering, plumbing, painting, etc. If clients require these services as part of their projects, the business must share some relevant information with the sub-contractors. For example, the business is required to share their design blueprints with plumbers or electricians to

provide the details about the locations of power and water inlets and outlets required. The business also uses subcontractors with its IT systems. Software used to carry out business operations is developed by third parties. To understand and implement business rules, organisational knowledge needs to be shared with their IT sub-contractors.

4.3.3.3. Organisation and other factors

4.3.3.3.1. Sector

The owner observed that the construction sector is an industry sector where building designs, architectural plans and diagrams are openly shared in the digital world. Businesses make their designs available on their websites, use social networking for marketing and this makes it difficult to protect them.

4.3.3.3.2. Organisational structure

A new, unexpected, factor affecting KP emerged in the METCON3 case. The manager of the business believed that the roles of different departments and their flow of information has inbuilt informal protection mechanisms. For example, the Design department provide their designs to the Construction department which further provides information about the products required for the construction to the accounts department with product codes and names to generate invoices. Thus, not all departments have access to all knowledge. The Design department do not need to access cost details of products. The business therefore does not need to implement strict security measures that may slow down knowledge access across departments.

4.3.3.3.3. Location

The METCON3 manager did not believe there is any impact of location on the use and implementation of KP methods. Their business operates in the metropolitan region and in some rural areas. No differences were reported operating from these different locations, as the remote access to the centralised database (with the same restrictions) enabled the business to follow the same informal and formal protection mechanisms in their regional offices.

4.3.3.3.4. Age of business (years)

The age of the business is believed to be a factor that has a direct impact on their use and adoption of KP strategies. The manager believed that construction requires a focus on various factors, and it takes times to understand those factors. Over time and with experience, sales employees at METCON3 learn the processes and techniques to make estimates, increase profit margins and use sub-contracting efficiently. However, they are not

always able to apply that knowledge effectively because of their lack of experience. Although the business has been in operation for nine years, this is a short time compared to some of their competitors. For this reason, the business finds it difficult to compete with other, older businesses in the same sector. As the business ages and becomes more knowledgeable, they might start looking into other effective protection methods that could be embedded into their business operations. The manager commented that, “We might invest into patents once we grow more mature and start inventing our own designs and products.”

4.3.3.4. Knowledge Protection Strategies

METCON3 uses copyright to formally protect their business knowledge. In addition, they use a mixture of semi-formal and informal methods such as secrecy, restricted access, contracts and documentation, fragmented division of labour and access privileges. Organisation structure also impacts the adoption and implementation of KP strategies. Most of the business data is stored in a centralised database. Laptops are provided to employees if they are responsible for managing data. Hardcopy documents are kept to minimum and important files are mostly kept in digital format in a password secured system. Large, important projects are under restricted access. All soft copies are password protected; hard copy documents are openly available within the organisation. When clients require customized designs for their homes, software is used to build architecture blueprints, and they only receive a printed copy of their floorplan. Copyright is used to protect their designs. The business has successfully built display homes for the previous five years and use photos of their buildings online to promote their business. All their online pictures are protected by copyright. With custom design builds, the business requires clients to sign a consent form to use their house pictures. The business's decision to switch from external professional photographers to in-house photographers has provided another layer of protection, along with copyright.

The IT systems in place are outsourced and they are designed based on the needs and requirements provided by the business owner. The owner/manager provides a set of guidelines outlining the business strategies and constraints **as business rules** to be met by the database system. The provided business rules are enforced in the underlying database system of the business. Database concepts such as indexes, views, stored procedures etc are followed. Database views are created based on user roles. When users access information, only information required to perform their roles and responsibilities are made available. Users are categorised into various roles such as Sales Agent, Sales Manager, Human Resource Manager, Accounts Manager etc. Managers can access more information than operational staff. For example, the Human Resource Manager requires access to employee details and do not require information related to construction, display homes etc. This helps to limit organisational knowledge to only those who need access to it.

The business has not invested in specific KP strategies for tacit knowledge. Contracts and documentation contribute towards KP. Tacit knowledge is mostly converted into explicit knowledge using documentation, which can be protected using other informal means of protection, such as cabinet locking and restricted access. They also rely on the Victorian Building Authority (VBA) and Victorian Civil and Administrative Tribunal (VCAT) to deal with disputes and complaints with suppliers, partners, and customers.

Some pieces of information cannot be protected with any strategy, such as purchase order information. Long term employees of the business are knowledgeable assets and so far, there is no strict protection method which could be used in such cases. The employees who have been working with the business from a long time develop strong trustworthy relationships and do not pose the knowledge leakage threats.

4.3.3.5. Summary

The use and implementation of KP methods is directly impacted by the size, age, revenue, and industry sector of the business. With the increased size, age and revenue, the business has invested in more infrastructure and technologies. This has enabled the business to implement new and improved protection mechanisms. As the business places extra emphasis on its IT systems, this provides an extra level of protection for them. In addition, if the revenue does not permit this, then instead of adopting expensive formal KP methods, the business can protect their organisational knowledge with multiple layers of informal protection methods. The industry sector of the business also strongly impacts the adoption of KP strategies. Open availability of diagrams and designs do not require extensive protection mechanisms. If similar services are provided, then it is important for them to protect knowledge to attain competitive advantage.

4.3.3.6. Knowledge Protections Benefits

METCON3 believes that the use and adoption of KP strategies support innovation and value creation. The business uses social marketing for publicity and to attain more customers, whereby they upload their construction designs to Facebook and Instagram under copyright protection. While focusing on their main business and outsourcing IT services they do not have any measure in place that can help them to keep track of their designs being downloaded and used by their competitors. The Manager also believes that copyright is a very weak formal protection method as in today's digital world people can easily edit images, remove copyright symbols, and use them as their own. The Manager said, "we don't really know how we can track the access and usage of our images in this digital world."

Some employees have left METCON3 after gaining sufficient experience and started their own business. Nevertheless, the Manager believes they are not able to use the knowledge they have gained for their advantage as they do not have complete information. With restricted access, division of work, authorisation, and authentication, the information that employees could otherwise access is not fully available to them. This is an effective strategy as employees are only able to access what is required to perform their role. After employees leave the role, access to organisational resources is removed. Additionally, as most of the employees remain with the business for a long time, knowledge leakage from them is not a problem due to their trustworthiness. The tacit knowledge acquired by the employees is translated into documents and converted into extrinsic knowledge, which is protected by various semi-formal and informal protection methods. Hence, METCON3 believes that formal, semi-formal and informal methods adopted so far are currently providing the required KP to the business. At present the business does not need to spend their limited profits on adopting more expensive protection methods. However, if required, the business would not hesitate to implement other protection mechanisms.

4.3.3.7. Impact of COVID19 on KP adoption

METCON3 did not make any big changes to their adopted KP strategies. COVID19 impacted the business overall meaning the core business processes were affected but non-core business processes like implementation of protection strategies did not undergo any change. The owner of the business mentioned that in the time of pandemic, "it was even more important for us to keep the business running with the limited resources we had and also government regulations advised not to start any new construction, except completing the ones that are already under contracts." Some of the business processes were conducted online like virtual tours of the properties and building sites, design discussions, contract signing but all these were protected with existing informal and semi-formal protection methods.

4.3.4. Case METCON4

4.3.4.1. General description

METCON4 was another construction business selected for the study. It is part of a larger business group as presented in figure 4 developed based on the business information gathered, which includes METCON4 homes, but it also has a host of subsidiary companies, including a licensed plumbing and electrical business, a land development company, a resorts business, a finance arm, an IT team, an aviation service, medium and high-density living solutions and a storage business. METCON4 has been awarded a number of industry awards, such as best sustainable home design, the best display home award worth \$350K

to \$500K at the prestigious Master Builders Association awards. This indicates that the business needs to protect their organisation knowledge to attain competitive advantage. Air services is the aviation wing of the business that not only provides efficient travel for the executive management but also provide a 'bird's eye' view of available land. Building services provide customers with repair, maintenance, refurbishment, and fit-out services for both residential and commercial projects. The business has a large team to take on large volumes of work and also have an extensive contractor database that allows them to respond to emergency make-safe and repair works. The finance sector is comprised of industry accredited professionals and assists in finding suitable loans for their customers. Digital solutions provide 3D architecture visualizations and drafting services. Trade solutions provide electrical and other technical installations for residential, commercial, and industrial premises. The land development company acquires land to develop itself, as an equity participant with others or it enters into agreements with landowners to develop land on their behalf. They also sell land directly to the public and partner with a wide range of builders to provide complete house and land packages. Storage services provide range of services from the hire of external and internal storage facilities to removalist capabilities and truck hire.

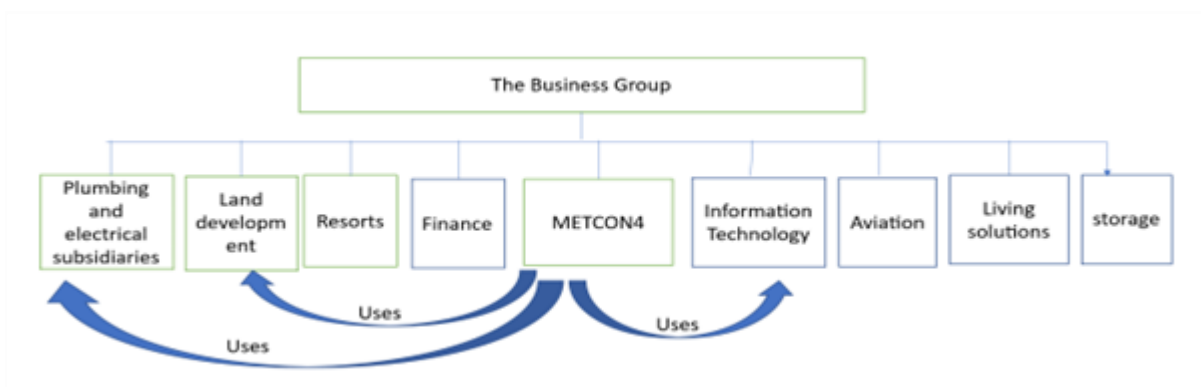


Figure 4 Researcher developed Organisation Chart for METCON4

METCON4 is a well-established business, 36 years of age and has built over 2,000 houses in Australia. The selected business is a franchise business. The firm best fits the definition of a large medium business with around 150 employees and eight departments. The main departments are Sales, Operations, Construction, Maintenance, Displays, Interior Design, Human Resource, and Accounts. The business has offices in various states of Australia such as Queensland, New South Wales, Victoria, Canberra, and Australian Capital Territory. The interview was held at the participant's home as he is a family friend of the researcher. He works as a sales manager in the company and has been working there for the past ten and a half years. The interview lasted approximately one hour. The informal setting of the interview enabled an open and clear communication.

The major type of construction services provided by the business are multi-unit development, knock down and rebuild projects, house and land packages, financial assistance, plumbing and electrical instalments. METCON4 believes in the use and implementation of KP strategies to maintain competitive advantage. Their name is a renowned brand in the construction industry, and this is the reason they believe that implementing KP strategies is particularly important for their business to maintain their reputation. Hence, they use a mixture of semi-formal and informal protection methods along with copyright.

4.3.4.2. SME characteristics

4.3.4.2.1. Business size

Although METCON4 belongs to the SME sector, the business believes that “it doesn’t matter if you are a big business or small, it is important that every organisation employ protection strategies.” Building over 2000 houses and with extensive customer base, the business makes larger profits than most smaller businesses in the sector and can thus invest these in things like KP strategies.

4.3.4.2.2. Owner/manager characteristics

As the interview was conducted with the Sales Manager of the business, he commented that the Manager of the business believes in protecting organisational knowledge against any accidental or intentional leakage. To achieve this each business group has their own dedicated IT department responsible for the effective implementation of protection strategies. The manager of the business has more than 40 years of experience. He has owned and operated his own construction company in the past. He is not only qualified in business management; marketing etc. but also holds a certificate in contract law. His knowledge and experience enable him to understand, analyse and adopt KP strategies according to business needs.

4.3.4.2.3. Flexibility

The business is a large medium sized business with the employee number range close to the upper bound of a medium size business. The business has a group of subsidiary businesses as shown in fig 5. to ensure the construction process is smooth and straightforward for their customers. The size of the business does not offer much flexibility, however the organisational structure and availability of different websites for each business group enables efficient adoption of KP strategies. Each business group can have their choice of KP strategies implemented depending on their needs and structure.

4.3.4.2.4. Relationships

As METCON4 is a business comprising various business groups and a large database of contractors, they must maintain strong and trustworthy relationships with all their business partners. One of the most important things to build such relationships and grow the business is knowledge sharing within and outside organisational boundaries. Whilst sharing knowledge, specific attention is paid to the level and extent of knowledge that is shared. For example, METCON4 provides regular technical briefings to contractors to ensure they understand the latest safety protocols, equipment use, and regulatory compliance standards. During the onboarding sessions for new contractors METCON4 include case studies of past projects to help them align with firm standards and expectations where it becomes very important that they do not leak any confidential knowledge about their past projects

4.3.4.3. Organisation and other factors

4.3.4.3.1. Sector

When the manager was asked about the relationship between the industry sector of the business and the adoption of KP strategies, he commented that, “Every business should protect their organisational knowledge. The only thing which differs is the type of knowledge you are protecting in different sectors. Knowledge is an important asset for every business organisation.” In the construction industry sector, the business processes, designs and ideas are remarkably similar which do not require extensive formal protection. METCON4 utilises the digital world to advertise its services to potential new customers. In addition to their business website, they also have individual websites for each of their group of firms. The business also uses other means of digital networking such as social media. Web presences enable their customers to do research on them, select designs and contact them for quotes. This helps in extending their business and attain customers but also poses security threats in the digital world. Competitors can also access the knowledge available online such as building blueprints but the business is not concerned about this knowledge leakage. The participant commented “We are in an open business and there is no harm in sharing design ideas. Accessing pictures will not give any information about how specific business operations are performed. They are just static pictures.”

Knowledge which is publicly available is open source with limited protection such as display home design pictures and blueprints, which are openly available on the company’s website. Anyone can access and decide which design they want to go ahead with. Once the client has decided the design, the detailed knowledge about the construction, specific details of the construction, such as colour selections, kitchen appliances and tiles etc are provided to the client, either through digital or hard copy documents. Every business has their own unique

codes for their products and documents. When documents are shared with clients, selected products are included with their product codes and names which are hard to understand even if they are leaked out.

4.3.4.3.2. Location

METCON4 is the only business case in the construction industry sector which was a franchise business of an Australia wide group of businesses. They have their own IT department, and the participant advised that the implementation of KP strategies totally depends on their capacity and infrastructure. The interviewee indicated that the location does not have a significant impact on the adoption of KP strategies. The offices in regional areas might experience low internet speed but that does not change the implementation or selection of protection mechanisms. However, there is little evidence to prove this is true as most of the offices are in the metropolitan area, including the selected case study.

4.3.4.3.3. Age of business (years)

METCON4 has been operating for many years and have built over 2000 houses. Due to their long time in the business, they have established a strong customer base. Working as a group of companies for a long time, sharing knowledge and working with contractors enabled them to learn about newer and more efficient protection mechanisms. Over time they have learnt that instead of using one layer of KP it is important to use multiple layers of protection. The Manager stated that with time they have realised that formal protection methods which are financially expensive and time consuming to acquire such as patents and trademarks are not adopted by the business.

4.3.4.4. Knowledge Protection Strategies

The common KP methods employed by METCON4 are copyright, secrecy, restricted access, contracts and documentation, fragmented division of labour and access privileges. Over time they have identified various semi-formal and informal protection methods. Being a medium sized business, they have separate departments to look after specific business operations. They have employed restricted access and fragmented division of labour across departments. Not all employees are provided access to all business information, and appropriate access privileges are provided to enable employees perform their specific roles and responsibilities. METCON4 uses copyright to protect their in-house developed designs.

The business has IT managers to look after the IT systems that are in place. They have a dedicated internal IT department that is responsible for the implementation of informal KP strategies such as authentication and authorisation. Different business groups use different KP strategies based on their needs and organisational knowledge. The departments dealing

with external collaborators require more effective protection strategies to inhibit knowledge leakage. Whereas the departments mostly handling internal affairs could overlook some of the strict protection mechanisms. For example, sales, construction, display homes and maintenance departments deal with external sub-contractors, suppliers, clients, and customers, hence are more particular about protection strategies to restrict unwanted knowledge access by sub-contractors. By contrast, human resource and accounts departments mostly deal with internal employees matters, thus knowledge can be protected with minimal layers of KP.

Different access levels are provided based on confidentiality, needs and requirements and mostly relate to information protection. For example, display colour information is confidential and is only kept in printed format at company office in locked cabinets with restricted access. Approved home designs for specific land sizes and location are another piece of information that is only provided to the client once they make a final decision to proceed with the construction. All digital files are password protected. Confidential and important information files are kept in a secure system which has restricted access. Authentication and authorisation are required from the employees when they access information from databases to perform the duties and responsibilities and based on their authorisation level only the needed information is made available. Clients only get a printed copy of their designs that are protected by copyrights. Tacit knowledge is hard to protect and the only mechanism in place is employee contracts.

4.3.4.5. Summary

The use and implementation of KP strategies in METCON4 is influenced by the age, revenue and type of service provided by the business. This was confirmed by the Sales Manager, who stated that their profits enable them to consider various protection mechanisms that they could utilise to protect their knowledge. METCON4 do not innovate new designs, as most of the work they do is generally same across the industry sector. Hence, they believe that the current selection of formal and informal protection methods is providing them the needed security against knowledge leakage. But the business did not have anything specific in place to protect their tacit knowledge. The Manager noted that they use employee contracts, but with no specific clause to inhibit their employees from joining their competitors and sharing their business ideas with the new business managers. The sales manager also expressed his concern that even if such a clause is included, they will still not be able to monitor such activity.

4.3.4.6. Knowledge Protections Benefits

METCON4 believes that protecting knowledge and implementing KP methods is important as it helps to achieve competitive advantage. Their ability to protect their business knowledge from competitors helps to improve their relations with their business partners and suppliers and ultimately improves business process outsourcing. The business is operating from last 36 years without any noticeable news of knowledge leakage. Their brand image and strong customer base provides a certainty to the business that they are protecting their knowledge effectively and provide unique home designs. The business makes efficient use of formal and informal protection methods to avoid knowledge leakage.

4.3.4.7. Impact of COVID19 on KP adoption

Just like other businesses in this industry sector, METCON4 also did not see their KP strategies impacted by the COVID19 outbreak. The business utilised their existing protection strategies, but the extension of adoption has increased. Moving online exposed the businesses to security threats so the business has to be careful in their adoption of protection strategies. Furthermore, some informal strategies such as authentication, authorisation, division of work required more clarity and adoption for any knowledge sharing process. COVID forced the business to move some of their daily operations online such as online client meetings, stakeholder meetings, design selections etc. The business utilised the same informal and semi-formal protection strategies such as authentication, authorization for all online business activities. All client designs after personalisation are saved in protected shared drives with limited access. This was introduced during pandemic and was not in place pre-COVID. Overall, the adoption of protection strategies did not undergo any change. The results of the Construction sector cases will be analysed in the next chapter, Table 7 below provides a quick summary of observed pattern.

Table 7: Cross-Case Analysis Summary - Construction Sector

Factor	Sub-categories	Observed Pattern Across Cases
SME Characteristics	Size	Smaller firms (METCON1, METCON2) rely almost entirely on informal KP strategies due to limited resources; larger and more established firms (METCON3, METCON4) adopt layered approaches combining informal, semi-formal, and selective formal strategies (e.g., copyright).
	Owner/Manager characteristics	Higher IT knowledge and prior business experience support more structured informal KP (e.g., layered access controls); lack of technical or legal expertise results in minimal, ad hoc KP adoption.
		Smaller firms are more flexible in introducing KP strategies quickly but apply fewer measures; larger firms are less flexible structurally but more systematic and consistent in KP implementation.
		Strong reliance on subcontractors necessitates selective knowledge sharing; KP is enforced through trust, contracts, fragmented work allocation, and restricted access rather than formal IP mechanisms.
	Industry Sector	Open design sharing reduces need for patents; informal methods dominate
	Age	Younger firms prioritise business survival and market growth over KP; older firms progressively expand the scope and sophistication of KP strategies as experience, revenue, and exposure to competition increase.
	Location	Geographic location (metropolitan vs regional) shows little influence on KP adoption; similar informal and semi-formal strategies are applied regardless of location.
KP Strategies	Formal	Limited use of formal KP; copyright is selectively adopted by more mature firms (METCON3, METCON4), while

		patents and trademarks are largely avoided due to cost, time, and perceived low applicability.
	Semi-formal	Role-based access controls, organisational structure, and restricted system privileges are more evident in medium-sized firms.
	Informal	Dominant across all cases: secrecy, restricted access, authentication, cabinet locking, contracts, documentation, and fragmentation of work.
KP Benefits	Perceived Benefits	Benefits are mostly indirect and perceived rather than formally measured; include competitive advantage, client trust, reduced knowledge leakage, and support for sustained growth, more clearly recognised by older and larger firms than younger ones.

The following section presents the cases for the next industry sector in the study.

4.4. Rental, Hiring and Real Estate Services

The second sector selected by the researcher was rental, hiring, and real estate services. This industry is one of the top five industries in Australian SMEs. It includes rental services such as car renting, transport equipment hiring and renting, farm animal leasing, machinery renting and hiring, video and other electronic rental and hiring, residential property operators, non-residential property operators and real estate services. As of 2017, rental, hiring and real estate services had experienced a moderate growth with an increase of 5.3% in Industry Value Added (IVA) and was Australia's largest source of sales and service income with \$74.7 billion (ABS 2018).

The property operators and real estate services subdivision is the dominating subdivision in the sector, with 84.5% of Rental, hiring and real estate services division's IVA in 2016-17. It consists of businesses who rent, lease, sell or manage property assets. In the previous financial year 2016/2017 there was a 10.2% increase in residential property prices, although non-residential property operators were the largest contributors. Among these, real estate services were the dominating and largest employing class. Micro businesses (employing 0-4) were the major contributors towards rental, hiring and real estate services division's IVA. They were also the largest contributor to division's total income with 65.1% contribution and lowest expenses because of lower wages and salaries (ABS 2018).

Figure 5 indicates that SMEs are the largest employment contributor in the subdivisions, followed by medium sized businesses. Operating Profit before Tax (OPBT) from Rental, hiring and real estate services division also was \$71.7 billion in 2016-17 making the division a top contributor. Small businesses accounted for 77.8% to the division's OPBT.

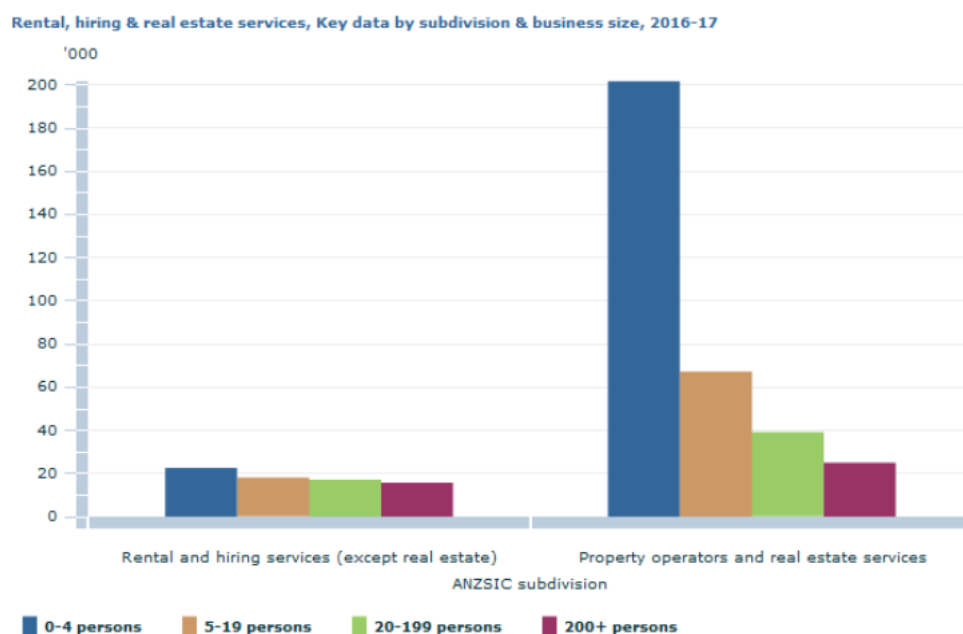


Figure 5 Key data by subdivision & business size. Source: (ABS 2018 Fig. 4)

The rental, hiring and real estate services industry sector is also the highest contributor of micro businesses (employing 0-4 people). In 2016-17 micro businesses contributed most of the total employment in the division (55.2%). This was influenced by the property operators and real estate services as a large number of working proprietors, partners and state representatives and trustees are mostly represented in the micro business size category (ABS 2018). Table 8 provides detail about the businesses in the rental, hiring and real estate services industry sector that participated in the study.

Table 8: Details of Rental, hiring and real estate industry cases by the researcher

Business code	Rental, hiring and real estate Industry			Age (in years)
	Employee Number	Number of departments	Type of Services	
METREL1	50	8	Renting, selling, buying, financial assistance and property management assistance	20
METREL2	3	2	Selling and buying	1
METREL3	50	9	Renting, selling, buying, financial assistance and property management assistance	5
METREL4	4	4	Renting and selling of residential properties only	6

REGREL1	21	4	Selling development lands for future homes, commercial, industrial properties	5
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4.4.1. Case METREL1

4.4.1.1. *General description*

The first business in the sector of rental, hiring and real estate services industry sector is a real estate business. METREL1 is a well-established real estate business with 50 employees and eight departments. The selected business is a franchise business. The business belongs to the category of medium size businesses, according to the Australian Bureau of Statistics definition. The main departments of the business are development, sales and marketing, brokerage, property management, lending, professional services, human resource, and accounts. Real estate development refers to the process of adding value to land by purchasing raw land, rezoning, construction, or renovation of a building and then either selling or leasing the finished product to earn profit. Sales and marketing operate in the same manner as other businesses where businesses sell or lease the buildings or units they build. To facilitate transactions between the sellers and buyers of a property, the real estate business has a brokerage functional unit. This unit comprises a team of real estate agents who represent either as a buyer or as a seller and help their clients achieve a purchase or a sale in their best interests. Property management is mainly responsible for renting services such as collecting rents, showing units, performing repairs, and managing tenants. Lending is one of the functional units that plays a very vital role in the real estate industry. This unit deals with lenders, who include banks, credit unions, private lenders or government institutions who provide leverage to the business for their properties and developments. Along with these the business also provides professional services such as accountants, lawyers, interior designers, stages, contractors, and tradespeople etc.

The interview was held at the businesses office and lasted approximately 50 minutes. The participant had worked there as a sales manager for the previous 13 years. Even though the interview was set up in a formal environment, the researcher and interviewee were friends, and this enabled a free flow of discussion.

METREL1 owns multiple offices throughout the region. The franchise is spread over three suburbs and the directors of all the offices work together to develop a strong and successful team. These relationships have allowed the business to grow significantly. Traditionally, the business had only one office but to accommodate the growing number of employees in the organisation they opened new offices. The success of the business depends on the collaborative efforts of their different offices and employees. To accomplish this, they must continuously share their client's expectations, priorities and needs. The business develops

their marketing campaigns based on shared information across the three business offices. This need for shared practices requires the business to practice their KP strategies efficiently and seriously.

There are four main categories of real estate: land, residential, commercial, and industrial properties. The selected business works mainly with residential and commercial buying, selling, and renting of properties. Residential is the most common type of real estate which consists of housing for individuals, families, or groups of people. Commercial properties refer to business buildings rented or bought by individuals or organisations to carry out their business operations. As these services require storage and usage of confidential knowledge, the business has invested in various semi-formal and informal protection methods along with the copyright.

The business believes that the already adopted semi-formal, informal methods along with copyright provides the needed KP so far. The focus of the business is to provide the best real estate experience to their clients and to increase their market value and build trustworthy relationships with their customers. They do this by providing excellent services such as effective communication, professional advice, and successful marketing. To achieve this the business pays close attention to the effective implementation of already adopted protection strategies to ensure their clients that the privacy and security of their shared knowledge is of utmost importance for the business. To achieve the business mission and objectives they spend most of their resources on the core business processes.

4.4.1.2. SME characteristics

4.4.1.2.1. Business size

Although METREL1 is a medium sized business (and thus larger than a small business) it is still restricted in its ability to adopt and implement KP strategies. The business believes that it is important to use the business revenues for core business processes and expansion. The lack of resources because of their small size (compared to large businesses) is one of the main barriers to the adoption of KP strategies.

4.4.1.2.2. Owner/manager characteristics

The interview was held with the sales manager of the company, who works with the director of the business. The owner/managers are not as directly involved in the business like with other businesses interviewed thus far, and the director takes on the role of managing the business. The director of the business is well qualified to guide and monitor the management of the company. The role of director in this business is different from the previously interviewed owner/managers. The participant mentioned that the director of the business has

over two decades of experience in the industry. Even though the director's education involved majoring in English and Physical education, what he has learned from his experience has taught him that the business does not need to invest in any expensive formal protection methods. The businesses he worked for in the past were thriving and expanding without overindulging in KP protection and implementation. This suggests that the attitude of the director has a direct influence on the adoption of KP strategies. Hence, based on the sales manager's views on the director's experience it appears that the business has all needed protection mechanisms in place for now.

4.4.1.2.3. Flexibility

From the earlier discussions, it is suggested that the SMEs are more flexible than large ones. METREL1 is a medium size business with eight departments that makes the organisation structure complex as compared to small businesses selected for this study. As the business is a franchise, it is bound by the Franchising Code of Conduct to adopt the methods of its parent company. Thus, copyrights belonging to the parent company such as designs, images, and the company's name are automatically inherited by the franchise under the rights granted by the franchise agreement. However, the business is still well capable of reaping benefits from the flexibility offered by its medium size. The adoption and implementation of informal protection methods is generally not viewed as a core business process across the real estate industry. So, this offers a flexibility of making their own decisions regarding the adoption and implementation of KP strategies to franchises. For example, when the business shares any documented knowledge with the parent company, they follow the parent company communication model to protect against any possible leakage. But if the business needs to share any knowledge with contractors or clients then they chose their preferred ways of protection to provided restricted and authentic access. Hence, METREL1 can adopt and implement suitable protection methods as per their need and resources (and keep their parent informed of their strategies to avoid disputes and conflicts).

4.4.1.2.4. Relationships

The business works with small local businesses such as plumbing, electricity and other maintenance and repair businesses. However, these inter organisation collaborative works do not require METREL1 to share their organisational knowledge. Hence, their adopted informal protection methods provide them the needed security for any knowledge thefts that could happen.

4.4.1.3. Organisation and other factors

4.4.1.3.1. Sector

METREL1 is a well-established business in the Rental, hiring and real estate industry sector. The rental hiring services provided by the business are quite similar to the services provided by other businesses in this industry sector. Most of the documents used by METREL1 are similar across the rental, hiring and real estate industry. The majority of them are available online and are publicly accessible. The interviewee commented that “the business knows that it is important to protect organisational knowledge. The forms used to gather client data are publicly accessible. In addition, our role is to secure the gathered data and organisational knowledge.” The processed information in the form of extrinsic knowledge is well secured with informal protection methods such as locked cabinets. The business needs real time access to knowledge related to various subjects such as knowledge about the core business and affecting market conditions, current business objectives and corresponding real estate requirements, and the latest approaches to real estate. To stay ahead the business relies heavily on knowledge sharing between employees and developing new knowledge such as marketing strategies, strategies to sell property, strategies to evaluate and hire real estate photographers etc. The business needs efficient communication processes and implementation of strict security measures to restrict their employees from sharing knowledge with other businesses and employees in other departments who do not require that knowledge to perform their roles and responsibilities.

Like every other business, METREL1 also prepare market research reports, which they analyse to develop strategies for the growth of the business and all these documents are in the form of explicit knowledge. Along with these other financial documents, such as purchase and expense documents, supporting documents for every leased or sold item such as invoices, email records, credit card slips, cancelled cheques, cash register tapes and account statements are also recorded by the business. Most of the documents contain data and information but these documents act as an input to perform a business analysis and identify if their business is improving, which items are selling, and which are not. The formulated business strategies need protection from leakage. The business strategies are mostly kept in the documented form which can be easily protected using informal protection methods. Some part of these strategies is also available in tacit form which is also protected using informal and semi-formal protection mechanisms.

4.4.1.3.2. Location

METREL1 is a metropolitan-based business operating in technologically advanced suburbs where modern infrastructure and technology support are readily available. Although these

suburbs offer state-of-the-art facilities, most of METREL1's protection methods such as restricted access, authentication, authorisation, and data confidentiality are not dependent on their physical location. Hence, there is no identified relationship between location and usage of KP methods for METREL1.

4.4.1.3.3. Age of business (years)

The business is in an acknowledged and renowned business in the real estate industry. Over a decade, the business has established its image and market value. With age and growth, the business has identified that it is always important to protect their organisational knowledge and they have tried to expand their implementation of KP. The interviewee stated that their business always had KP strategies in place, but age has its impact in their adoption and utilization. The main effect that age has is the expansion of the geographic locations that has to be secured as the business grew and expand. With the opening of new offices, the need emerged to invest in the adoption of protection methods at those locations. The business also added layers of protection over time such as policies and procedures, which are documented and are placed in locked cabinets located in restricted access areas. All the layers encompass semiformal and informal protection methods along with copyright. For example, any documented policy could be placed in a locked cabinet within a restricted access area, and any digital knowledge could be protected with different authentication and authorization restrictions.

4.4.1.4. Knowledge Protection Strategies

METREL1 has adopted various informal and semiformal KP methods. All formal documents such as marketing analysis reports, brochures and flyers, creative property listing descriptions, professional real estate taken photographs, drone shoots and original building blueprints etc. are protected under copyright. Other organisational documents and relevant knowledge databases are protected with semi-formal and informal protection methods such as restricted access, cabinet locking, authorization, and authentication etc. The business is required to retain their business records for seven years, and all such records are kept electronically, protected by passwords and firewalls. Hard copies of such records are kept in locked storage. Business market reports, trend analysis reports, business strategies, change to business practices are protected with restricted access. Most of these reports are kept electronically which are only accessible to authorised staff.

For the growth and success of the business, regular training programmes are provided to METREL1's employees. Most of these programmes are security awareness programmes to ensure that the employees understand and follow company policies and practices to help ensure the security of organisation knowledge. For example, a market report accessible via

a password should be protected with a strong password, and employees should not write that password on a sticky note pasted on their computer screen etc.

The tacit knowledge acquired by the employees over time is also protected with regular training on ethical and professional behaviour. Training programmes such as ethics and compliance training help create a more aspirational workplace and provide additional value to the employee experience and hence increase employee satisfaction. Satisfaction usually enhances employee retention and therefore prevents knowledge leakage.

As stated earlier, the contents of formal documents are protected under copyright protection law. However, the participant stated that copyrights do not provide strict protection it just makes copying a little harder. Templates of forms and applications are easily available on internet. People can download and use the knowledge to develop their own applications. Copyright just restricts the direct usage but do not inhibit knowledge access. Based on what the participant has said the researcher has assumed that copyright does provide the required protection as someone can download a property description or blueprints from the internet, it does not necessarily mean that they are getting access to the knowledge that the business is putting on those documents when they use it for their own purposes. As mentioned, the business believes in the implementation of KP strategies but not heavily strict formal methods such as IP and trademarks.

4.4.1.5. Summary

The data suggests that METREL1 believes in the implementation of KP methods. The selection of KP methods is affected by size, age, revenue, services, and owner/manager characteristics they provide (and are also related to the sector they are in). Even though METREL1 is a medium sized business, and the participant has indicated that the business tends to focus on their core business activities rather than using available time and resources on the implementation of costly and lengthy KP strategies. Their business size and limited revenue inhibits KP implementation, the firm still believes that it is required for them to protect their customer's confidential information, along with their organisational knowledge. The past experience and attitude of the business director also impacts the implementation of KP strategies vastly. Various semi-formal and informal protection mechanisms such as restricted access, cabinet locking, authentication, and authorization are effectively implemented along with copyrights.

4.4.1.6. Knowledge Protections Benefits

The effective use and implementation of KP strategies prevents knowledge leakage and the interviewee acknowledged that business is continuously reaping the benefits such as

customer satisfaction and increased turnover. He believed that protecting unique knowledge enabled their business to innovate new ideas and services. However, he did not support his statement with evidence, hence it is based on their gut feeling. The business had a recent data breach early in the year of the interview, where some of the archive boxes containing personal information of vendors, purchases, tenants, and landlords had been stolen from a locked cabinet. It has been confirmed that most of the stolen boxes have been retained but to understand the effect in more detail further questions might be asked.

4.4.1.7. Impact of COVID19 on KP adoption

The rental, hiring and real estate industry had witnessed a boom with the hit of COVID. But METREL1 did not see their KP strategies impacted by the outbreak. The business utilised their existing protection strategies, but expanded their use of them. COVID forced the business to move some of their daily operations online such as online client meetings, stakeholder meetings, house inspections, online auctions etc. The business utilised the same informal and semi-formal protection strategies such as authentication, authorization for all online business activities. For online meeting and inspection only, the registered clients received an invitation. They further required a passcode to join the online sessions. All sessions recordings were saved on the cloud by the business. These changes were introduced during pandemic and were not in place pre-COVID, but are still in use because of their efficiency. Overall, the type of KP strategies were not vastly impacted.

4.4.2. Case METREL2

4.4.2.1. General description

METREL2 is the second business selected for the purpose of this study. The business is a micro business, with only three employees and two departments (operations and sales & marketing). As the business is a family owned start up business, it did not have strict functional boundaries. At the time of interview, it had been in operation for just one year. The interview was held at interviewee's home and lasted approximately 40 minutes. As the interviewee is a friend of the researcher, information was exchanged freely and openly. The business's main office was set up at home.

The business mainly deals with buying and selling of private properties. The business has only implemented informal methods of KP such as secrecy, restricted access, contracts, and documentation. METREL2 is a very small and young business and operates like private investors who buy property and sells it off to make revenues. The business sometimes also helps people to sell their properties. As the business is new, they charge less for their services when compared to larger, well-established businesses. Limited (documented)

business processes are one of the reasons that the business does not see the need to invest in the formal protection methods. The owner/manager said, “we are too young to focus on such strategies and moreover we never felt we need any strict methods to protect our knowledge”.

4.4.2.2. SME characteristics

4.4.2.2.1. Size

The use and adoption of knowledge protection strategies is clearly affected by the size of the business. METREL2 is a micro business making small revenue and has little market share. This restricts them from extensive implementation of any formal or expensive KP strategies due to their expense and complexity. The business is more focused on growth and acquiring customers than employing extensive protection mechanisms for the small knowledge base. Also, the business is a family-owned business with no external people involved, so there is little external knowledge sharing. The owner of the business said that “the cash flow is very essential for our business survival, and as yet we are struggling to find the cash flow for further investment. Hence, we cannot afford to spend on explicit KP strategies.”

4.4.2.2.2. Owner/manager characteristics

The owner/manager of this micro business is mainly responsible for making all strategic decisions about business operations. The owner’s brother acts as the IT/Knowledge manager in the business. He has qualifications in information technology and looks after the ICT related processes such as KP methods employed by the business. He designs various informal protection strategies such as password protection, restricted access modes etc. The business does not invest in more complex processes because it does not deal with substantial knowledge generation. The business processes mainly rely on data and information about the rental market conditions. For most of the KP implementation the owner relies on his brother. He trusts his brother to cover for the skills the owner/manager does not have expertise in such as implementation of KP strategies. They both have a shared responsibility towards their business.

4.4.2.2.3. Flexibility

The small size of the business offers increased flexibility. The owner/manager, being responsible for most of the decision making, can easily adapt his strategies as demand changes. Limited resources can be quickly and smoothly deployed between different activities and tasks providing functional flexibility. As the employees are family members, this enables the owner to change the number of hours worked or wage rates depending on the financial position of the business. The same flexibility also applies to the use and

implementation of KP strategies. The business can easily adopt new strategies if required based on the economic and market conditions. In this case the owner manager has empowered his younger brother to make his own choices for the adoption of KP strategies.

4.4.2.2.4. Relationships

METREL2, being a young and very small business does not work extensively with external businesses or contractors. But the business does require support from banks, accountant and lawyers. As all the expertise required to run the business is not available in-house, it is crucial for the business owner to develop and maintain close trustworthy relationships with these outside providers. A banking relationship is an obvious need for this business as the owner not only needs them for routine business banking but also for growing capital to buy properties and to bridge the gap between payables and receivables. The banks require lot of knowledge about the business such as the history of the business and the owner's judgement and credibility. Similarly, the business owner also works closely with his accountant to make most of the profits out of his business. The owner has to share his business knowledge with his accountant to identify the ways through which business can save on their tax deductions, get benefit from government rebates etc. As both banks and accountants have their own policies in place for the privacy and security of their clients the owner is not concerned about the protection of the documents provided to these two entities. Moreover, the business shares important information with the bank, but not necessarily important knowledge. The business also maintains close and professional relationships with lawyers as they often rely on them for a wide range of legal services that are critical to the success and compliance of their operations such as drafting and reviewing purchase and sale agreements, ensuring compliance with contract law, represent business in lawsuits or mediate disputes. METREL2 does not share important knowledge (such as their business strategies) or policies with banking and accounting firms. They have to share lease or sale agreements with the lawyers when dealing with disputes, but they mostly have data and information. Hence, the owner is satisfied with the KP strategies in place to protect their organisational knowledge.

4.4.2.3. Organisation and other factors

4.4.2.3.1. Sector

METREL2 only deals with buying and selling private properties, and the type of forms and documentation mostly used are common to other similar businesses in the industry sector. The business does not have an online presence, so nothing is available online for competitors to access and imitate. Their most common business focusing is buying a property and selling it, which does not involve any external clients other than the buying party. All the information and knowledge required from the buying property is mostly documented and is easily

protected with informal protection methods such as cabinet locking and restricted access. Furthermore, the firm's decision policies which constitutes the organisational knowledge are either verbally shared between the family members or are electronically saved in their laptops which are password protected.

4.4.2.3.2. Location

TMETREL2 is a home-based business situated in the metropolitan area, with all IT support received from their service providers. The business does not invest in the implementation of explicit KP strategies that require specific IT infrastructure or skills. So, for METREL2 there is no impact of location on the adoption of protection strategies yet.

4.4.2.3.3. Age of business (years)

The age of METREL2 plays a significant role in the adoption of KP strategies. Being young and not being exposed to competitors yet, the owner of the business does not fully understand the risk of knowledge leakage. The business operates in a niche market. The owner of the business commented, "my business is just a start up business and is more like a family investment business. Also, it is a side business and we both still have our own separate stable employment. So, we are not competing with anyone in the market."

4.4.2.4. Knowledge Protection Strategies

The interviewee commented that "we know it's important to protect organisational knowledge, but we don't have much to protect at this stage. We simply implement everyday protection mechanisms that we also apply to our personal information. We are also not innovating anything which would require more formal protection mechanisms. Just doing some routine things like using passwords, locked cabinets, keeping restricted access and deployment of family members with understanding of ethical behaviour to protect our knowledge from being leaked or altered. So, at the stage informal KP methods embedded in our business operations provide us the needed security".

4.4.2.5. Summary

Based on the data gathered and analysis of METREL2 case, it can be concluded that the business has adopted very few KP methods. The two main reasons behind the limited adoption of KP strategies are their small size and their short time in business. Most of the employees are family members, so most of the knowledge sharing is internal and is usually protected with trust in employees. Organizational policies are not formally documented hence do not require explicit protection methods. Hence, most of the organisational knowledge is tacit and whatever part of it is documented, is protected with informal protection mechanisms such as password protection, restricted access, cabinet locking etc.

4.4.2.6. Knowledge Protections Benefits

The business owner doesn't really understand how KP effects his business, neither does he know what benefits he could reap from their implementation. The young age and limited market exposure did not provide any information about the benefits that the business has achieved with the effective and efficient implementation of informal KP strategies. The owner of the business states," at this stage I do not really understand what that means and nor we have any metric to measure them."

4.4.2.7. Impact of COVID19 on KP adoption

When contacted afterwards regarding the effects of COVID, it was found that the business is no longer in operation.

4.4.3. Case METREL3

4.4.3.1. General Description

METREL3 fits into the definition of SMEs with 50 employees and nine departments. The business is a franchise real estate business. The main departments are rental, sales, marketing, brokerage, property management, finances, human resource and accounts. Among all the services the business provides, rental and sales are the most successful. The business is a part of a larger business group, which includes Residential, Commercial, Rural & Livestock, Projects, Property management, Marine, HTL (hotel) Property, Concierge, Insurance and Business sales. METREL3 belongs to the group of businesses that was established in the previous century and is one of the most successful real estate businesses with 1000 franchises across 11 countries. METREL3 was established in 2018 and they are ranked fifth in Victorian offices among all the franchisees for their excellence service in property management. The business does not invest in formal KP strategies. Generally, informal protection methods are able to provide the required protection against any organisational knowledge leakage (as described below). Note that this business interview was conducted after the COVID-19 pandemic had arrived.

The interview was held with the sales manager at his office. The interview was held with the sales manager at his office and lasted for approximately 45 mins. As the participant was a family friend, the interaction was comfortable and informal, which encouraged open and honest communication. This contributed to a successful interview and yielded valuable insights.

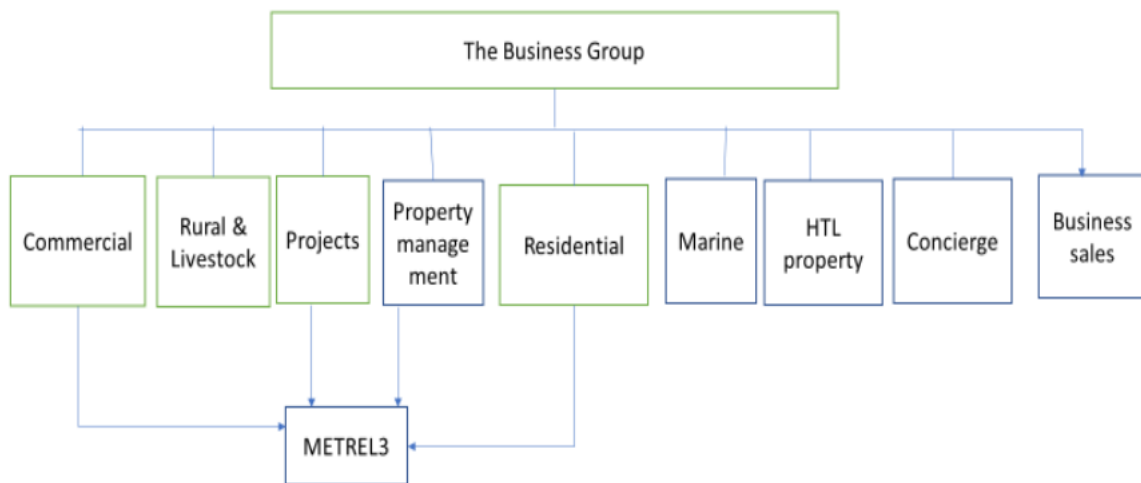


Figure 6 Researcher's representation of Organisation Chart for METREL3

4.4.3.1.1. Overall group

The business group is thriving in the market, and to sustain its competitive advantage, it requires robust key performance KP strategies. As shown in Figure 6, the group consists of several specialised business areas, each catering to different segments of the property and services market. The Residential division focuses on rental and sales services for residential properties. It provides tailored solutions to help customers maximise the value of their assets. The Commercial segment manages sales and leasing of commercial properties, handling transactions exceeding \$2.5 billion annually. Its operations span both domestic and international markets. The Rural & Livestock business serves the rural community, including landlords and farmers, offering land sales, leasing, and livestock auctions. Recognised as one of Australia's most innovative marketing groups, it plays a vital role in supporting rural development. The Projects group specialises in end-to-end project sales and marketing. It draws on internal databases, call center insights, and financial analyses to craft revolutionary marketing strategies that not only enhance business profits but also deliver value to clients. Property Management is dedicated to supporting landlords and business owners in understanding market trends, developing investment strategies, and improving property yields. The Marine division oversees auctions and sales of marinas and marine vessels, catering to niche marine property markets. HTL Property provides integrated services across the hospitality sector, including investment sales, marketing, and strategic advice. Its portfolio covers pubs, taverns, clubs, resorts, motels, backpacker accommodations, caravan parks, and management rights. The Concierge group helps customers transition smoothly into new homes by offering services such as home and contents insurance, coordination with removalists and tradespeople, and access to discounts on homewares and artwork. The business group also includes a dedicated Insurance division that supports clients in finding

the most suitable insurance cover. Finally, the Business Sales division provides expert guidance on business acquisitions and optimisation of home-based business operations. Each of these specialised areas, illustrated in Figure 6, contributes to the group's diversified portfolio and positions it for continued success in a competitive marketplace.

4.4.3.1.2. METREL3 as part of the overall group

METREL3 is a new franchise of this group of business with only four years in operation. But with a recent boost in the market the business had seen a steep increase in sales at the time of interview. The business mainly works in four business areas: residential, commercial, property management and concierge. Most of the work is with buying, selling and leasing of residential and commercial properties.

4.4.3.2. SME characteristics

4.4.3.2.1. Business size

The size of the METREL3 impacts its ability to implement KP strategies. Being a medium size business, METREL3 makes substantial revenue but the business cannot afford to spend that on extensive implementation of KP strategies due to their associated cost. The business is more focused on growth and acquiring customers, especially after COVID because of the increase in the market competition. As the business is still in a growth spurt, only being established five years earlier (before the Pandemic), it spent its resources on the adoption and implementation of operations to sustain the market. The smaller size and limited financial revenue restricted the business from investing into expensive time-consuming formal protection methods.

4.4.3.2.2. Owner/manager characteristics

The interview was held with one of the sales managers of the business. The owner of the business appointed a director to look after the business. The director is mainly responsible for making the major business decisions with approval from the owner/manager. The interviewee commented that the knowledge and experience of the director in property management business had a direct impact on the implementation of KP strategies. The director of the business had nearly 20+ years' experience in the real estate industry. He has a diverse range of experience in the industry, not just working in different roles and positions but also working around the country. He also played a fundamental role in the launch of other new franchises across Australia. He is also responsible for ensuring that all new employees are fully trained in the business's use of a range of applications such as Customer relationship management (CRM- Locked On application with features such as client management, property lifecycle tracking, trust accounting tools), Google Analytics to track

website traffic and Trello for project management and adoption of organisational policies. This not only makes their business more efficient, but the business is also able to use the skill and knowledge of their well informed and proficient technical expert employees in the adoption of their KP strategies.

4.4.3.2.3. Flexibility

Flexibility is mostly not a feature of the business, given its medium size and also by the organisational structure adopted by the business. Being a franchise and limited liability company, the business is liable and accountable for performing their business operations as per the franchising company policies and procedures. However, the business still has some limited flexibility in making decisions relevant to internal business operations, which also includes strategies to protect organisational knowledge. The hierarchical organisation structure adopted by the business is one of the most popular organisational structures, allowing the business to make effective decisions. Whilst the top management is mainly responsible for making most of the business decisions, each department has the flexibility to adopt personalised strategies that allows them to perform their roles more effectively. This also impacts the adoption of KP strategies as each department can adopt strategies based on their needs and amount of knowledge that needs to be protected. It enables implementation of some of the semi-formal and informal protection methods easier such as division of work, restricted access etc.

4.4.3.2.4. Relationships

The business works with various external contractors and service providers such as banks, brokers, plumbers, electricians and various other contractor service providers. Most of these external collaborators do not require the business to share their important organisational knowledge. The external business partners mostly require information about clients. For instance, banks and brokers require client financial data to process their loan applications. Plumbers, contractors and electricians do not require any business or client information as their services are completely independent without any dependency on organisational knowledge. The relationship with their clients is one of the most important inter-organisational relations. The business processes related to rent, lease, selling or buying mostly require the business to share data and information without providing access to any of the underlying business policies and strategies. Hence, the needed protection is easily provided by the adopted informal and semi-formal protection methods.

4.4.3.3. Organisation and other factors

4.4.3.3.1. Sector

METREL3 is one of the most renowned businesses in the Rental, Hiring and Real Estate industry sector. The services provided by the business are mostly about buying, selling and renting residential and commercial properties along with services such as property management. Most of these services are similarly performed across this industry sector. The business conducts a lot of data collection and analysis to look over the market trends and use this to prepare their marketing strategies. METREL3 believes that its not only the organisational knowledge that requires protection but also the underlying data and information that requires protection from leakage. Even though most of the real estate forms are available online, they do not contain any data or knowledge that require protection. Data is collected on various figures such as local property values, local rental rates, area development plans, crime statistics, population trends and communities etc. All this data provides a very good insight into the area and helps the business in setting up strategies to perform some of the most critical business operations, such as finding the right tenants for rental properties, and finding the right buyers in the community to maximise profits. For example, if a property is available in a high-priced area, then buyers who are willing to pay that price will be the right choice, or if the community has special offerings such as specific schools that have strongholds in specific religions, then buyers who would like their children to go to that school will be more willing to buy the property. These strategies are developed based on collected and analysed data by the business. All the data and knowledge related to this analysis process and final findings along with business policies and procedures is either documented physically or exists in digital format, which requires protection.

The gathered data and analysis reports are also shared within the organisation, as different departments require different insights (e.g., renting and selling requires access to strategies to find the right tenant and buyer), accounts and finance department requires access to tenant's income and tax return information. All of this intra- organisation knowledge sharing requires the business to be careful with protection strategies to avoid unnecessary knowledge spill overs. The business talks mostly about data and information, but much of this acts as an input for creating organisational knowledge which requires protection. The required protection is achieved with the implementation of informal and semi-formal protection methods.

Franchise-status

It was felt that since franchising was such an important factor for this business that it should be discussed as its own influencing 'factor' in the discussion. Later discussion will consider

whether this (franchising) should be a factor to be included in the research framework. METREL3 is a medium size limited liability franchise business. The business's medium size enables it to implement KP strategies based on their requirements. However, being a limited liability and a franchise, the business is obliged to provide the products and services as per their franchising company. As the business is required to pay the franchise payment along with their other expenses, most of the financial revenue is used towards business management and customer attention. Because of the lack of financial resources, the business does not invest in expensive and time consuming KP strategies, rather it relies on the inexpensive informal protection methods that could be embedded into other organisational policies and procedures.

4.4.3.3.2. Location

The geographic location of the business does not appear to have a direct impact on the implementation and adoption of KP strategies as the offices are located in metropolitan Australia with access to most of the tools and techniques required to perform daily business operations. The organisational knowledge of METREL3 has many interesting market trends as the business mainly operates in the growing areas of Melbourne with multiple opportunities for buying and selling properties.

4.4.3.3.3. Age of business (years)

METREL3 considers that the age of the business might have an impact because of the recent growth in the business. The business had received many awards in the previous few years for their extraordinary performance in the real estate business. In addition, the pandemic hit the business when it was in its very early stages, which made the business review its existing protection strategies and ensure the migration of the majority of business operations from the physical to a virtual environment. With employees working from home and then later going back to the office, the actual strategies mostly remained the same but were applied at different locations. Examples include password protected computers holding organisational knowledge in offices being shifted to password protected computers at home offices. Files shared among employees using the business intranet required more secure channels when they were transmitted over private Internet services. The interviewee commented that, "with age and growth and changed market trends the business has to always keep up with their protection strategies."

4.4.3.4. Knowledge Protection Strategies

METREL3 has adopted similar protection strategies to most of the other interviewed businesses in the industry sector. The adoption of protection methods is impacted by its

medium-level size and its complexity offered by their organisational structure. The limited revenue earned was mostly spent on business survival in its early years of growth and during the pandemic. The business was more focused on the implementation of strategies required to sustain the business during COVID restrictions than on protection strategies. By being a franchisee and a limited liability business, METREL3 has to follow the same strategies as the franchising company. The scarcity of resources due to the smaller size restricts the business from implementing expensive formal protection strategies. The manager commented that, “the business is doing well in protecting its organisational knowledge with less costly protection strategies. Why spend more on something that is already implemented well?” The director’s past knowledge and experience is in the real estate industry. His understanding about the business protection requirements, knowledge sharing within and outside organisational boundaries enables him to make informed decisions regarding the implementation of KP strategies. Due to his extensive experience in the industry and working across multiple companies, he has the ability to take advantage of cheaper and less time-consuming protection methods. The flexibility offered by its medium size and organisational structure of the business enables METREL3 to implement KP methods as per the need. The departments dealing with knowledge generation such as marketing, human resource, administrative, business development and design use informal protection methods to effectively protect against inter organisational knowledge leakage.

The business protects its documented knowledge by relying on copyright protection along with other informal and semi-formal protection methods such as restricted access, cabinet locking, authorization, and authentication etc. In fact, their office building has recently been equipped with new facilities such as video surveillance, restricted access with cards, built in cabinets with password locks, automatic cloud storage etc. which makes implementation of informal methods more efficient.

Archived data and knowledge are protected with authentication and authorization and is saved remotely using cloud storage. Important documented information is saved with cabinet locking. Intra organisational knowledge is shared with restricted access and division of work based on the different projects people are working on or different departments they work for, and only the people involved are provided access to the required knowledge to perform their roles and responsibilities. The company has a training program whereby employees are regularly updated on organisational policies for data protection, cyber security and online presence and privacy etc. Employees are also educated on ethical information handling and ethical and professional conduct. The training programs related to the implementation and use of protection strategies ensures effective utilization of implemented protection strategies.

4.4.3.5. Summary

METREL3 is generally satisfied with the use and implementation of KP methods. The adoption of KP strategies is impacted by size, age, owner/manager characteristics, flexibility and services they provide (related to the sector they are in). METREL3 is a franchise business, and the business is required to undertake practices enforced by the franchising company. However, their medium size and flexibility enables them to make their own decisions regarding some of the non-core business processes. The interviewee indicated that smaller companies tend to focus on their core business activities rather than using available time and resources on the implementation of costly and lengthy KP strategies, especially when the business does not deal with creation or innovation of new designs or concepts. Despite the constraints offered by their size (such as limited revenue), the business still believes that it is required for them to protect their customer's confidential information, along with their organisational knowledge. The knowledge, skill and experience of the business director also has a profound impact on the implementation of KP strategies. Various semi-formal and informal protection mechanisms such as restricted access, cabinet locking, authentication, and authorization are implemented, along with copyright protection.

4.4.3.6. Knowledge Protections Benefits

Even though the business does not use any formal procedure to measure the benefits offered by the implementation for KP strategies, the business feels that it provides them with benefits such as competitive advantage and increased market share. While performing their market analysis, the interviewee noted that they capture a vast percentage of the market in the developing areas by finding the rights tenants, buyers and sellers. This provides an indirect indication that protecting organisational strategies i.e., knowledge and data enables the business to sustain competitive advantage.

4.4.3.7. Impact of COVID19 on KP adoption

This section was not relevant to this business case as the interview was conducted post-COVID. Hence the collected data already had their context covered.

4.4.4. Case METREL4

4.4.4.1. General Description

The fourth business selected from real estate is another franchise business that operates under a large real estate agency that was established in 2017 and has been an important part of the industry since then. The agency selects real estate agents around Australia for their local knowledge, integrity and track record. They help their agents create their own

brand and business. METREL4 is one of the agency's businesses that had been established four years earlier. The business is a micro business with four employees, including the director of the business and four departments (sales, property management, administration and accounts & trust department). The interview was held at the director's office and lasted approximately 45 minutes. The business was identified using the snowball technique as the business director is a friend of a friend.

The business' main focus is on residential sales – buying and selling. Some of the other services provided by the business are leasing and property management. The business uses a mix of semi-formal and informal protection methods such as secrecy, restricted access, division of work, contracts and authentication. METREL4 directly deals with members of the public who are interested in buying or selling a property. The business uses different ways of communication to expand their customer base such as social platforms, online presence, phone calls, emails and door to door sales. The setup of the business (just before the pandemic) encouraged the director to conduct most of the business processes online. Some business processes, such as reaching customers and conveying information about available properties occurred using online platforms, especially social networking. Once a client expresses initial interest the communication goes through protected virtual collaboration channels such as Zoom, DocuSign etc. In order to sustain the business, the owner used social platforms on a large scale to reach people and build its customer base. Most client meetings were held online during the pandemic and gradually moved to face to face meetings once lockdown restrictions were removed. METREL4 is heavily invested in semi-formal and informal protection methods as the business does not innovate or design new products, ideas or designs. The business is more about renting and selling available business properties. The main business driver is identifying and reaching potential buyers and sellers in the market and reaching them in order to persuade and use the business services. The director of the business states that, “we only help people sell and buy a property which does not require acquisition of any formal protection methods. The process does not require the [director's] business to share any business strategies.”

4.4.4.2. SME characteristics

4.4.4.2.1. Size

METREL4 is a micro business heavily involved in handling private transactions about property buying and selling. Their small size and limited number of services has a direct impact on the adoption and implementation of protection strategies as their lack of resources and revenue restrict the business from investing into expensive KP strategies. The director of the business has mentioned that they do “not require strict protection methods in place as

the business is a very small tightly knit group of people and close knit means it is easier to protect knowledge.”

4.4.4.2.2. Owner/manager characteristics

The director of the business is mainly responsible for all the strategic planning of the business. His previous experience from working with another real estate industry and educational qualifications in computer applications enables him to select and implement required KP strategies where they are needed. Adopted strategies such as authentication, authorisation, restricted access etc. only require basic IT skills and they can be implemented by the director of the business easily. Most of the adopted strategies by the business in their daily business operations fall under these informal and semi-formal protection methods that are easily embedded by the director and his assistant based on their understanding of the technology. The director noted that, “my assistant is even better than me in handling specific software that we use to collaborate with our clients as she holds specific certifications in them.” Both the business owner and his assistant collectively use their knowledge in the effective implementation of required protection strategies for their business needs.

4.4.4.2.3. Flexibility

The business not only has the flexibility offered by its small size but this new type of franchise structure where the franchise company allows the agents to build their own business and allows them to operate their business with few restrictions. The business can have its own ways of conducting business processes such as to acquire customers they can use social platforms, door to door sales, other marketing strategies etc. METREL4 is required to use the forms and general buying and selling procedural documents as provided by the franchising company, however they have the flexibility to adopt and implement their own KP strategies. The business brand name and its styling are important and it is the responsibility of the franchisee business to maintain these. The director of the business has been given the flexibility to change and adapt their protection strategies as he sees fit with his customers. The director provided an example of their selling strategy with clients. He mentioned that the strategy is mostly shared digitally and present informal protection methods can successfully protect against any leakage, but that some clients are “old school and want everything documented in hard copy. And for such clients we have to adapt our protection methods such as instead of password protection the document is cabinet locked”.

4.4.4.2.4. Relationships

As a new small franchise business, METREL4 do not deal extensively with external partners or contractors, they mostly work standalone. The main relationship for this business is their clients who are interested in buying or selling a property. Most of the KP in this type of crucial

relationship is maintained by building trustworthy relationships along with the use of informal protection methods. The business does not disclose any of their selling strategies with their clients. When a client is onboarded, they share some business insights to gain their trust and ensure them that they are in safe hands. Once they come on board then the client signs the contract with the business. According to the contract, the client cannot change their property representative for three to four months and neither can they share any related knowledge with other real estate businesses. For example, if a client signs the contract confirming that they will be using the business to sell or buy a property, then they cannot switch to another business in regard to the same property. Neither can the client disclose any information regarding any of the knowledge that is shared by their property representative about the sale.

4.4.4.3. Organisation and other factors

4.4.4.3.1. Sector

Being an area specialist agent in the real estate business, the main business processes of METREL4 are buying, selling and providing property management services to their clients. Being a franchisee, most of the business documents for gathering client data are provided by the franchising company. All standard documents such as property listing descriptions, social media content, website content, building design pictures, floor plans published online are protected under copyright by the franchising company. The director of the business mentioned that, “the business does not innovate or design any new ideas that would require any formal protection. Our business is mainly to find a buyer for a seller or a property for a buyer.”. But the business certainly needs to protect their business knowledge regarding the properties they are offering to their clients as it is important for the business to gain trust of their clients and achieve competitive advantage. Some examples of the common strategies adopted in the business are: establishing an online presence, displaying properties online, providing virtual tours and creating marketing videos. The business must be very careful with the extended exposure of the business knowledge to their competitors, any business-related information, properties available and relevant offers available online need to ensure that none of this online content will cause any knowledge leakage. For example, if the property is available for selling then its pictures any other business-related knowledge should be removed or made available under restricted access to protect against leakage and misuse.

4.4.4.3.2. Location

The director of the business mentioned that he mostly operates in his home office for business procedures. Other employees also work from their home offices. The business did not have a specific business office at the time of the interview. Hence, the business does not

invest in the implementation of explicit KP strategies that require specific IT infrastructure or skills related to buildings. Everyone is responsible for protecting their devices that they use for business work. The business operation area is mostly restricted to local geographic locations, as it highly depends on the business's know how of the real estate market and deep understanding of the community in which they operate. So, there is no impact of location on the adoption of protection strategies (yet).

4.4.4.3.3. Age of business (years)

The age of METREL4 plays a significant role in the adoption of KP strategies. The business operates in a niche market. It is different from other real estate businesses. METREL4's owner operates door to door for property evaluations and talking people into buying or selling properties. The business also uses web-based tools such as sending emails to people with property lists available for buying or selling. The director/owner of the business commented, "my business is a very generic business with very common property buying and selling business processes. At the moment I am satisfied with the protection provided by the currently implemented informal and semiformal protection methods." The director of the business also believes that in today's fast paced and highly competitive market, businesses like them actually do not have the time to chase a knowledge leakage. The business rather would focus on gaining other clients and improvise the selling strategy to avoid making the same mistakes.

4.4.4.4. Knowledge Protection Strategies

The director of the business strongly believed in implementing KP strategies but at the same time thinks that the industry sector in which the business operates do not require investment in formal protection methods. The business mainly deals with buying and selling of properties available in the market and the business does not generate much knowledge which requires protection. The business is more reliant on selling and buying strategies of the business manager which are mainly tacit and very limited knowledge that exist in the form of documents. This is sufficiently protected by the manager of the business using his knowledge and experience with the use of informal protection methods. His qualification in computer applications allows him to implement informal protection methods such as authentication and authorisation on documents and databases. His assistant also holds certification in the use of the software used in the business that enables her to safely store data and information used to generate and apply knowledge. A simple example is Microsoft excel sheets which can be individually password protected, tabs that can be hidden from unauthorised users, knowledge generated by data analysis tools remain hidden under in the application layers etc. Most of the business knowledge is effectively protected with the adopted informal and

semiformal protection methods such as authentication, authorisation, division of work, restricted access, cabinet locking and maintaining trustworthy relationships. Any online business knowledge that can be accessed on social platforms is abstracted (only high-level description is available with hidden details) and means general information is accessible to public what if they click on specific content then they are diverted to web page which requires either creating an account or contact the business via phone or email. As the business does not deal in extensive knowledge generation, that reduces the need of formal protection methods which are mainly required to protect unique ideas or designs generated by the business. The location of the business did not show any impact on their adoption of KP strategies because of the way the business operates but the age of the business and the dynamic world in which the business operates appears to show an impact. With age, the business has realised that they mostly deal with what is already available in the market such as properties available for sale or rent are open in the market. The pricing range for locations, house size, available facilities etc. is common among all real estate industries so there is no strict need of KP. Businesses focused more on expanding and changing dynamically to adapt to changed requirements have no time to deal with leakage but their ability to continuously change has enabled their business to reduce the impact of knowledge spillovers. Hence, the business was able to successfully operate in the previous four years and hoped to continue as is for the near future. If the situation is changed the flexible nature of the business should allow them to adapt their existing protecting strategies or even extend their present adoption of KP strategies. Most of the digital documents are protected with digital protection methods such as doc sign, restricted access etc. The selling or buying strategies adopted for particular clients are only shared with the involved people with different access privileges. Any important, documented organisational knowledge is protected with restricted access such as cabinet locking.

4.4.4.5. Summary

Based on the data gathered and analysis of METREL4 case, it can be said that the business has adopted very few KP methods. The four main reasons behind the limited adoption of KP strategies are their small size, industry sector, owner/manager characteristics and their short time in business. A limited number of employees with the flexibility to work from home could use different informal and semi-formal protection methods successfully. Organizational policies are not formally documented hence do not require explicit protection methods. Hence, most of the organisational knowledge is tacit, mainly residing in the business director's 'head' (gained over time with knowledge and experience) and whatever part of it is documented is protected with informal protection mechanisms such as password protection, restricted access, cabinet locking etc.

4.4.4.6. Knowledge Protections Benefits

The business owner believes in reaping benefits from effective organisational KP but also mentioned that they do not have anything in place to measure these benefits. The business owner relies on his 'hunch' that getting new customers on referrals means that his business is doing something different from other businesses. This provides METREL4 a competitive advantage. The business is doing something to effectively use their organisational knowledge and strategies, as the business heavily relies on this to find the right client with promising revenue towards the business.

4.4.4.7. Impact of COVID19 on KP adoption

This section was not relevant to this business case as the interview was conducted post-COVID. Hence the collected data already had their context covered.

4.4.5. Case REGREL1

4.4.5.1. General description

REGREL1 is a real estate business that falls under the rental hiring and real estate industry sector. The business was established in regional Melbourne in 2019. The business is a small sized business with 21 employees including three directors, a sales team, two managers at two different offices, a marketing team and a property management department. The business offers all major real estate services such as renting, buying, selling houses, units and apartments, as well as preparing and selling development land for future homes, commercial and industrial properties to international buyers. International buyers are contacts outside Australia who purchase development land for investments. The business also deals with shared accommodation handling for its customers. The business has an office in regional Australia and another in metropolitan Australia. However, the two branches are registered under two different names.

The interview was held with the owner/director of the business at the business office in the regional area. The interview was about 40 mins long. The business is the only real estate business interviewed for this study that deals with formal protection methods such as trademarks for logos, design rights and copyright on design ideas along with a mix of semi-formal and informal methods. The owner/director of the business believes in the implementation of the protection strategies very strongly. The business was selected using the referral strategy.

4.4.5.2. SME characteristics

4.4.5.2.1. Size

The size of the business impacts the use and adoption of KP strategies, but not significantly. The business always uses part of their resources towards the implementation of their protection methods. The business was a self-made business with visible growth over the years. The majority of their resources are focused on the growth and expansion of the business. The small size of the business makes it difficult to allocate resources to KP, but they do it anyway because the owner/director considers it to be important. The business has to carefully plan and spend some of the financial resources on acquiring formal protection methods.

4.4.5.2.2. Owner/manager characteristics

The owner/director of the business is a highly skilled and qualified managing director. His 11 years of experience in the real estate business provides him with vast experience and knowledge. He understands that the business should not just perform daily business operations, but he also needs to make strategic (longer term) decisions, such as with its KP strategies. His personal experience and journey to build his business makes him strongly believe in protection strategies. He mentioned that, “the real estate business is affected by a lot of external factors in the market which need to be studied and analysed. Various reports on these factors are produced which impacts the business operations and marketing strategies. They are knowledge for the business and need protection from leakage to competitors.” The owner/director of the business also faced financial hardships while setting up the business, so he understands how important it is for the business to stay competitive in the market and grow. He also believes that to acquire that competitive advantage it is necessary for the business to protect their organisational knowledge, especially the knowledge that enables them to identify the opportunities for expansion and growth. The business has its own IT manager who is responsible for the implementation of protection strategies in agreement with the owner/director. The owner/director is also a member of a local soccer club. The soccer club organises various sports and cultural events. This strengthens the communication and collaboration skills of the owner which he generally practices at work.

4.4.5.2.3. Flexibility

The small size and the hierarchal organisation structure of the business provides limited flexibility to the business in its decision-making process. The owner/director of the business is mainly responsible for implementing decisions regarding the implementation of business

strategies and the underlying organisation structure of the business enables them to smoothly communicate relevant information about business decisions to the employees down the chain. But the owner/director mentioned that as the business has two offices operating in different geographic locations, they each have managers responsible for managing operational tasks. This is not a very efficient structure. He mentioned that, “When the company started, I was mainly responsible for making all the decisions but now with expansion it is the board of the directors, branch managers and the IT manager who jointly make decisions regarding the implementation of strategies required for the business.

4.4.5.2.4. Relationships

Being a real estate business, REGREL1 usually works with many external contractors such as plumbers and electricians, as well as brokers and banks. They require constant communication and services provided by these external businesses to prepare the properties the business deals with. Most of these interactions generally do not require the business to share any organisational knowledge. The owner/director of the business mentioned that local and state laws regarding real estate businesses constantly change especially around international investments in land and property. Rules regarding renting, leasing, investing and multiple subscription, change constantly and it is important to keep all their employees informed of these changes. Occasionally, external experts are organised to disseminate this information and offer training to employees. External factors such as the economic state of the country, construction industry growth, availability of goods and technology effecting the business also need to be studied as they can have a direct impact on the business. Hence, the business occasionally invites trained experts to talk about these factors in the context of the business. This require REGREL1 to share some of the organisational knowledge with them, which poses the risk of knowledge leakage. This necessitates the adoption of effective protection mechanisms and hence the need to use a mix of formal, informal and semi formal protection methods.

4.4.5.3. Organisation and other factors

4.4.5.3.1. Sector

REGREL1 also deals with renting, buying and selling of properties and land. Much like other businesses in the industry sector, REGREL1 also has an online presence on social media and have their own website as well. These platforms are mostly used to post data and information about the properties available that is also available on the online presence of other real estate businesses. The sector of the business impacts the adoption of KP strategies moderately as the organisational knowledge in the form of market reports, analysed data and marketing strategies is not released on any of these platforms. The

business is not involved in the manufacturing of goods or the creation of unique product designs, as it primarily works with properties that are already built and designed by others. As such, there is no need for formal IP protections such as patents. However, the business does protect its original materials such as real estate documents including creative property description, original floor plans, marketing content, and written resources through copyright and design rights. Additionally, the business name and logo, which were designed by the owner, are registered with IP Australia.

4.4.5.3.2. Location

The business operates two offices in distinct geographic locations, one in regional Australia and the other in a metropolitan area. Over time, the company has observed significant differences in the implementation of its protection strategies, primarily due to variations in market trends and customer needs. The regional office benefits from lower competition, influenced by the local market conditions and the nature of sales. The business' location has created opportunities for growth and expansion, as the demand for land remains strong. The owner remarked, "There is more trust among people in regional areas because the community is small, and everyone helps each other." This strong sense of community fosters business relationships based on trust rather than aggressive competition.

In regional areas, buyers primarily invest in large parcels of land rather than built properties, a trend driven by geographical and economic factors. REGREL1 has capitalized on this by focusing on land preparation and sales to both domestic and international investors. These lands are predominantly used for agriculture, forestry, fishing, and dairy farming. For instance, a similar trend can be seen in Victoria's regional areas, where large land sales cater to agribusinesses and lifestyle farming. The relatively lower land prices and long-term investment potential attract both local buyers and overseas investors. In contrast, the metropolitan office operates in a highly competitive environment, where well-established competitors dominate the market. Due to the high demand for housing and commercial spaces in urban areas, REGREL1 had to shift its focus from selling large land parcels to offering smaller residential and office properties. Unlike regional buyers, metropolitan clients prioritize convenience, location, and immediate property usability. Property values also vary significantly between the two locations. To succeed in this market, REGREL1 had to build strong industry connections and offer unique incentives to attract clients. The owner shared, "The business struggled a lot in the initial years; we had to reinvest revenues from the regional office to sustain operations in the metropolitan market. However, the metropolitan business has seen growth in the last six months."

Unlike the close-knit regional community, people in metropolitan areas tend to be more independent and focused on their personal and professional lives. This presents challenges in establishing long-term client relationships and necessitates different business strategies. Because of the differences in the business processes across the two locations, the emphasis on protection strategies is also different. The regional office uses more informal protection methods such as trustworthy relationships, authentication and authorisation whereas metropolitan office focus on all formal, informal and semi-formal protection methods.

4.4.5.3.3. Age of business (years)

The young age (only 6 years old) of the business along with their business growth and expansion also had a significant impact on the use and adoption of protection strategies. The first branch of the business established in less competition prone area (regional Australia) was easier to establish as compared to the second branch (Metropolitan Australia). The KP methods adopted earlier were not enough to provide the needed protection to the newly targeted market. The business not only uses trademarks but uses design rights and copyright to protect their creative property work. Some of the protection strategies needed more layers, such as market strategies being protected using informal protection methods that require more stricter forms of protection while operating in more competition prone areas.

4.4.5.4. Knowledge Protection Strategies

The owner/director of the business highly valued the implementation of KP methods, which is why the business has adopted various different types of protection strategies such as formal, informal and semi-formal protection methods. Even it is a small sized business, it needs to protect its strengths and organisation knowledge to stay competitive in the market. The business owner started the business from scratch and built it slowly over the years. Starting from the business name, logo, slogan, mission and vision, the owner of the business has developed everything himself which is why he believes in protection methods. The business logo is registered with IP (trademarks) Australia. The business does protect its original materials such as real estate documents, marketing content, and written resources through design rights and copyright. Any other business knowledge such as market analysis and reports, planned marketing strategies, land development plans etc. are protected using semi-formal and informal protection methods such as restricted access, authentication and authorisation. Any tacit knowledge acquired by the employees over the years or through training and conferences is protected using contract clauses. Digital documents containing confidential data and information shared with clients are protected using informal and semi-formal digital protection strategies such as docu sign and restricted access. Any

communication that happens with overseas clients is also protected using informal and semi-formal protection strategies.

4.4.5.5. Summary

Based on the gathered and analysed data it can be said that REGREL1 utilises a mix of formal, semi-formal and informal protection methods as shown in Table 9. The small size and limited resources incline the business towards the adoption of informal protection methods where as the owner/director's experience and personal preferences mean that he also implements some formal protection methods. He personally believed in formally acquiring a trademark for the business logo and slogan. His work experience persuaded him about the adoption and use of design rights in the industry sector. The limited flexibility offered by the adopted organisational structure of the business meant they implemented informal protection methods more flexibly. The inter and intra relationships within two business offices and external organisations also impacted the adoption of KP strategies. Professional trainers invited by the business to share business insights and provide trainings to employees in market analysis and use of technology required access to some of business's organisational knowledge. To protect against any knowledge leakage the business adopts a mix of semi-formal and informal protection methods.

Table 9: Cross-Case Analysis Summary - Rental, Hiring & Real Estate Sector

Factor	Sub-categories	Observed Pattern Across Cases
SME Characteristics	Size	Micro firms rely predominantly on informal KP due to limited resources; medium-sized firms adopt more structured semi-formal strategies to manage increasing volumes of client data and internal coordination.
	Owner/Manager characteristics	Managerial experience and risk perception strongly influence KP adoption; experienced directors emphasise confidentiality and compliance, while younger managers rely on basic safeguards.
	Flexibility	Franchise affiliation constrains KP flexibility, whereas independent firms can adapt KP practices more freely to suit operational needs.
	Relationships	Extensive interaction with clients requires strong protection of personal and financial data; KP focuses on

		confidentiality rather than protection of proprietary business knowledge.
	Industry Sector	Standardised processes and publicly available forms reduce emphasis on formal KP; protection efforts focus on securing client information and transaction records.
	Age	As firms grow older and expand offices or services, KP scope broadens to include layered access controls and documented policies.
	Location	Location has minimal influence overall; regional firms rely more on trust-based informal methods, while metropolitan firms use more layered protections due to higher competition.
KP Strategies	Formal	Rare use of formal KP; trademarks and design rights appear only in exceptional cases driven by branding considerations.
	Semi-formal	Increasing use of restricted access, authentication, and documented procedures in medium-sized and franchise firms.
	Informal	Predominant use of secrecy, cabinet locking, passwords, contracts, and trust-based practices across all cases.
KP Benefits	Perceived Benefits	Improved client trust, regulatory compliance, reputational protection, and customer retention rather than innovation-based competitive advantage.

The industry sector of the business has a mild impact on the adoption of protection strategies as like other similar businesses REGREL1 also shares information about their properties available in the market using their social media and website. Also, as the business does not manufacture any products, they do not require patents. Property designs are protected under design rights. The geographic location of the business implied differences in the adoption of protection strategies. As the business was established at two different geographic locations, due to the differences in customer behaviour and market conditions, the business has had to implement tailored protection strategies in both locations. In the regional office, KP focuses

on safeguarding client trust and ensuring fair dealings in land transactions. In the metropolitan office, the focus shifts to securing competitive market insights, maintaining client confidentiality, and leveraging digital marketing to protect business growth. Lastly, the age of the business itself has not impacted KP adoption significantly but the growth and expansion of the business at such a young age, along with location, has influenced the business to adopt varying protection strategies with time. The business extended their protection methods and have implemented more sophisticated protection methods in the metropolitan office such as biometric access restriction and video surveillance.

4.4.5.6. Knowledge Protections Benefits

Although the business does not follow a formal procedure to measure the benefits of implementing KP strategies, it strongly believes that these strategies provide significant advantages, including a competitive edge and increased market share. The owner is particularly committed to the importance of protection strategies, recognizing them as a key factor in the company's long-term success.

The interviewee noted that the business consistently captures a large share of the market in developing areas by using market analysis to carefully identify the right tenants, buyers, and sellers. This indirectly highlights how safeguarding organizational strategies and data plays a crucial role in maintaining a competitive advantage. By protecting valuable market insights, client information, and business strategies, the company ensures its ability to sustain growth and outperform its competitors.

4.4.5.7. Impact of COVID19 on KP adoption

This section was not relevant to this business case as the interview was conducted post-COVID. Hence the collected data already had their context covered.

The presentation of results now moves to the Professional, Scientific and Technical Services sector.

4.5. Professional, Scientific & Technical Services

The professional, scientific and technical services industry sector (abbreviated to 'Professional Services' sector) includes scientists, accountants, advertising/marketing specialists, lawyers/solicitors, veterinarians, management/other consultants, photographers, architects, engineers and computer system designers (Department of Industry, innovation and Science 2018). The subdivision provides services such as business management services, compliance services, financial services, IT services, accounting services, marketing services etc. Over 95% of all the subdivision's firms employ less than 20 people (IBISWorld 2017).

The Professional services sector is one of the top contributors to the Australian economy in terms of employment, industry value and productivity improvement. In the five years up to 2018 employment in the industry increased by 14.8 percent. Table 10 shows professional services contribute 42.5 % to Australian industry value (Australian Trade and Investment Commission 2018)

Businesses in professional, technical, and scientific services industry sectors handle the largest amount of confidential client information and data. The services this sector provides mostly depend on their clients' financial or organisational knowledge. Based on their clients' requirements, Professional Services businesses develop business strategies for them. And this puts the professional services sector at a greater risk of losing their business and clients due to knowledge leakage. These businesses need more efficient KP strategies because they can cause financial, physical, or psychological damage to their clients. So, there are higher risks of liability charges in this industry sector (Department of Industry, innovation, and Science 2018).

One important aspect of the subdivision is that it provides are compliance services. Compliance Services cover a whole spectrum of compliance advice including identification of compliance obligations, requirements, and commitments for key compliance areas to recommendations on the design and implementation of compliance management systems. Clients range from start-ups in the industry sector such as education, financial service providers etc. who require comprehensive compliance consulting services to clients who have experienced rapid expansion and found out that their systems and processes have not been able to cope. The rapid expansion puts a burden on such businesses to focus on their core business processes and at the same time also maintain and follow all required industry standards. Consulting services aid their clients to acquire compliance accreditation for higher education providers (HEP), Australian Securities and Investments Commission (ASIC) licenses for professionals who deal and advise about financial services such as investment and insurance plans, etc. Also, Professional Services help clients preparing for internal audits, internal reviews, and peer reviews.

IT services are often referred to as Information Technology consulting or computer systems and design services. These businesses advise organisations on how to make the best use of their available technology to achieve their business objectives. The other major role provided by IT consultancy companies is to support the business by developing software, designing applications and web designs for clients such as government organisations, educational organisations, and private individual clients.

The Financial services industry sector includes businesses providing a range of services. These include services direct to consumers and businesses as well as services to other businesses in the industry, covering investment advisors, financial planners etc. They provide specialized services in accounting, taxation, and ASIC compliance, such as providing financial advice, advising about insurance and superannuation products, managing financial assets etc.

Table 10 provide details of the businesses in this sector that has participated in the study.

Table 10: Details of Professional, Scientific and technical services businesses

Business code	Professional Services Industry			Age (in years)
	Employee number	Number of departments	Type of Services	
METPST1	1	0	Compliance services	4
METPST2	6	3	IT designs and applications	7
METPST3	3	4	Financial services	20
METPST4	14	4	Financial planning services	29
REGPST1	3	3	Accounting, Taxation and Business consultancy	4

4.5.1. Case METPST1

4.5.1.1. General description

METPST1 is the first business selected from the sector of professional, scientific and technical services. The business falls under the category of a micro business. It is a self-owned business with just one employee and no specific departments. The interviewee was the founder and the director of the business. The interview was held at the interviewee's office and lasted for nearly 50 minutes. The researcher and the interviewee had known each other for eight years professionally. The interviewee is a colleague of the researcher and they have developed a trustworthy relationship over time. The researcher and the interviewee work with a common educational institute which is different from the business interviewed in the study. In the educational institute the interviewee works in the different department from the researcher. The interview about the business did not introduce any conflict of interest. The interviewee voluntarily participated in the study and willingly answered all the questions. This help and support assisted the researcher to conduct a healthy and constructive discussion. The owner of the business oversees functional areas like accounts, IT and other services himself. The business outsources its IT services to an IT service provider. All the compliance related documents that need to be printed are handled by a trustworthy hired contractor.

The business offers professional consultancy services to educational institutes in all fields including start-ups and established institutions. The compliance services offered by the business cover a whole spectrum of compliance advice including identification of compliance obligations, requirements, and commitments for key compliance areas to recommendations on the design and implementation of compliance management systems. At the time of interview, METPST1 had been in business for four years and had dealt with very confidential client information such as existing organisational policies, education strategies and learning assessment strategies. However, the business owner/ manager had only implemented informal protection methods. Although the owner/manager mentioned informal methods only, based on the researcher's understanding of classification of protection methods it has been identified that the business actually implements a mixture of informal and semi-formal protection methods.

4.5.1.2. SME characteristics

4.5.1.2.1. Size

METPST1 is a young and small business with limited resources. Thus, the owner is more focussed on establishing and maintaining the business rather than investing in new forms of protection mechanisms. Moreover, the owner/manager of the company does not feel the necessity to incorporate new KP methods when the business can achieve the required level of protection with current practices. The small size and limited resources, limited finances and lack of technology availability impacts the number and extent to which KP strategies can be adopted by the business. The owner of the business understands the importance of KP strategies but said that "informal methods are enough at the stage, the size of the business matters. Formal methods may be required in the future but at this stage I have not really felt the need".

4.5.1.2.2. Owner/manager characteristics

The interviewee is the owner/manager of the business and is solely responsible for looking after the business. Being the only employee, he makes all the decisions about the business ranging from selecting a client to formulating strategies to work with the selected client. The owner/manager of METPST1 had worked with a few different educational organisations as an academic for the previous 15 years. Most of the clients of his business are small educational companies located around Australia. Being a part of the same sector as his clients, he understands the importance of KP strategies. The owner/manager's morals and principles appear to play a significant role in the adoption of KP strategies. He mentioned that "every business should consider KP, because companies work with clients, so KP is important to retain your customers." He gave an example of the famous chef who used to

work at a restaurant and then opened his own restaurant afterwards. To expand his business, he copied the names of clients from his old restaurant's booking register sitting on the reception table. He called these clients to have a meal at his restaurant and built his customer base from there. The owner of METPST1 said, "that even a booking register containing the name and phone number of a customer is sensitive in this case and it should have been protected."

4.5.1.2.3. Flexibility

The small size of the business provides it with a very flexible structure. The Owner/manager of the business has all the freedom to change and update any business policy or process such as adoption of KP strategies as the need arises.

4.5.1.2.4. Relationships

Being a consultant, METPST1 deals with clients ranging from start-ups in the education industry (who require comprehensive compliance consulting services) to clients who have experienced rapid expansion and found out that their systems and processes have not been able to cope. The main service of the business is focused on supporting organisations to become 'accreditation ready' against a wide range of industry standards and frameworks. Most of the clients are higher education providers. This business is talking about their customers with respect to relationships as compared to earlier cases. This is unique to the business as the business solely work for their client based in Australia. These are inter-organisational relationships that impact the adoption of KP strategies.

The business works with a contractor for its publishing requirements. The contractor also looks after the printing requirements of the client reports containing important organizational knowledge. To ensure the security of his client's knowledge being leaked or misused by the contractors, the owner of METPST1 uses protection methods such as secrecy and documentation in the form of contracts. The owner also mentioned that the contractor is a trusted friend. This implies that the adoption of the informal protection method *maintaining trustworthy relationships* can enable a business to protect against knowledge leakage.

4.5.1.3. Organisation and other factors

4.5.1.3.1. Sector

The core business process of METPST1 is to assist education providers all over Australia in understanding and resourcing their accreditation requirements, identify the evidence obligations of their accreditation framework and to prepare them for assessments and audits. The business does not just provide support with external audits but also aids to prepare for internal audits, internal reviews, and peer review processes. To provide these services,

METPST1 must review their clients' current policies and procedures, operational workflows and templates to identify opportunities for improvement and align their documents to new legislation. The business assists in developing valid and legally defensible programs meeting industry and accreditation standards. The clients of METPST1 are spread all over Australia, so the main medium of communication is via digital communication channels such as email with shared online documents (such as spreadsheets). As the business deals with numerous clients providing similar services, it requires diligence to ensure that there is no leakage of knowledge across this client base. The owner of the business gave an example when he was working with one of his clients from a start-up business. The owner mentioned that the client understands the term Registered training organisation that requires a registration by the Australian Skills Quality Authority to deliver Vocational Education and Training services. But the client was not familiar with the term 'education compliance'. Hence the owner explained the term with examples, but without providing any direct reference to any of his other clients' processes. He added that, "It is my responsibility to maintain the organisational knowledge about my clients safe."

The owner of the business understands that it is his responsibility to protect against any kind of knowledge leakage from one client to another. As a professional, the business especially needs to ensure that client knowledge (in the form of their processes) is protected. The strategic documents developed for clients are customised for every client and contain highly classified organisational knowledge.

4.5.1.3.2. Location

Implementation of KP methods seems not to be impacted by the location of the business. Most of the business is conducted online from the home office of the business owner/director, providing a very secure place for the storage of the documents and files. Informal methods like locked cabinets, restricted access etc. have been implemented easily and effectively. Most of the informal methods of protection such as limited shared cloud spaces, online documents with password protection simply rely on internet services which are easily accessible anywhere in Australia irrespective of the geographic location.

4.5.1.3.3. Age of business (years)

METPST1 is a small business that had successfully been operating for the previous eight years. As the business does not have any functional departments and did not expand in terms of size over time, its age had no significant impact on the adoption of KP strategies. The business customer base has been expanded but this does not affect the business processes and procedures. Hence, METPST1 can effectively utilize the already adopted KP strategies with any new customers.

4.5.1.4. Knowledge Protection Strategies

Various organisational and SME characteristics had a major impact on the adoption and implementation of KP strategies. Limited resources, owner's ethical behaviour and sense of responsibility and the types of services provided (specific to the sector) have all influenced the adoption of various protection methods. This includes not just the type of services but also the mode in which the services have been provided. The owner/director did not find the need to implement formal protection methods because the business did not develop new products, innovative designs or generate new design ideas. The business had implemented multiple layers of semi-formal and informal protection methods such as secrecy, restricted access, contracts and documentation, fragmented division of labour and access privileges. The compliance services sector requires exchanges of highly confidential information, and the digital communication medium is used as the main mode of interaction with clients. These documents are mostly shared via emails and the owner of METPST1 maintains these documents containing key organisational knowledge on his laptop and a personal desktop (with another back up copy saved on the owner's cloud storage). Hence, the owner of the business takes extensive security measures (all informal) such as document encryption, different access privileges (locked and protected spreadsheets) and using dedicated, authenticated email addresses. Documents are only shared with nominated parties and clients. All documents are password protected and passwords are shared with text messages. The manager stated that, "the business requires protection methods in place but as the business does not deal with designing new ideas or innovate new designs or products, it does not require any formal protection mechanisms". Hence, various informal and semi-formal protection methods are adopted to protect against knowledge spillovers.

4.5.1.5. Summary

METPST1 has adopted a mix of informal and semi-formal KP methods. The main reasons behind the limited adoption of KP strategies are their small size, owner/manager characteristics, and industry sector. Being the only employee with one trusted contractor enables the business to keep organisational knowledge (much of which is knowledge about client processes) protected. Organizational policies are not formally documented; hence they do not require explicit protection methods. Most of the organisational knowledge is tacit and whatever part of it is documented is protected with informal protection mechanisms such as password protection, restricted access, cabinet locking etc.

4.5.1.6. Knowledge Protections Benefits

The participant strongly believes in the implementation of KP strategies. He said it not only helps in securing his documents, but also in maintaining his relationships with customers. He

noted that, “when you respect customers’ privacy and security, then they not only believe in your work but also respect you. Customers are the key stakeholders of every business and maintaining trustworthy relationships with your customers and protecting their information should be your top priority. Hence, adoption of KP strategies is extremely critical for the expansion and retention of your business.” The main reason behind the expansion of the business from one state of Australia to other states was “word of mouth” which means clients of the business provided references. However, the owner of the business did not use any formal metric to measure the success or benefits reaped from the adoption of KP strategies. The owner senses that there have been no major problems faced by the business so far with regards to knowledge leakage.

4.5.1.7. Impact of COVID19 on KP adoption

METPST1 did not introduce any changes in their adopted KP strategies due to the pandemic. Even though, the COVID-19 has impacted the business like any other business in Australia, the implementation of protection strategies did not see any change. The owner of the business mentioned that in the time of the pandemic: “the education industry faced extreme challenges due to border closures. And as most of the business clients were educational institutes, the business was also facing hardships.” The business saw a reduction in work as the client companies were also focussed on maintaining their businesses and keeping their financial revenues to survive the pandemic period. The pandemic did not have any influence on the adoption of KP strategies as the business was always conducted online.

4.5.2. METPST2

4.5.2.1. General description

The second business selected from the professional services sector is METPST2, a small size enterprise with six employees and three departments (administration, accounts and sales). The business provides services related to IT designs and applications such as web applications, desktop applications, mobile apps and ecommerce solutions for their clients. The main services provided by the business are core software developments such as building responsive web applications, developing cross-platform mobile apps, building databases and user-friendly software interfaces. The business also provides other supporting services such as data migration, application migration to the cloud and source code recovery. Clients could be individuals starting a new business or educational organisations requiring web applications for their business processes. METPST2 help their clients to streamline their business processes as well as create new revenue streams. The company had been in business for seven years at the time of interview. The owner of the business mentioned that the business is not inventing anything of their own so do not require formal protection

methods. If the business expands and starts innovating new ideas and designs, then they will plan to invest in more strict and sophisticated ways of protections like patents and trademarks.

The interview was held with the owner/manager of the business at METPST2 owner's residence. The interview lasted for 45-50 minutes. The business has mainly invested in informal and semiformal protection methods along with the use of copyright.

4.5.2.2. SME characteristics

4.5.2.2.1. Business size

METPST2 is an information and communication technology business but still does not invest heavily in KP strategies. The business is categorized as small and is not the main source of income for the owner/manager. The owner started the business as a side business with his friends (the other five employees). The business provides a large range of services, but not all services are advertised, hence the clients are utilizing only few of the services provided such as web application designs, software deployments etc. The smaller size and limited customer base have had a significant effect on the business's resources and revenue. The owner of the business has plans to expand it and said, "it is important for us to use our limited resources for the growth and expansion of the business rather than formal protection methods which we might never use."

4.5.2.2.2. Owner/manager characteristics

The main qualifications of the owner are in IT software development. Most of the business decisions are made by the owner. As mentioned earlier, the other business employees are the owners' friends, and they have all studied together. Possessing IT skills and knowledge, the owner thinks that he and his employees can protect their organisational knowledge using IT based informal and semiformal KP methods such as authentication, authorisation, firewalls etc. which they can implement themselves.

4.5.2.2.3. Flexibility

The small size and flexible organisation structure provide flexibility in job roles and decision making. The owner commented that having an informal organisational structure allowed them to adapt and respond quickly when needed. METPST2 uses a team-based, flexible approach to their projects. This structure allows the business to make frequent changes and customize roles for employees, based on how they are allocated to different tasks or projects. Similarly, KP strategies are also adapted based on the undertaken projects and the employees allocated to them. For example, the business forms a project team for application development. The team developing the application will be given access to their client's

business documents, policies or hardware devices for application deployment or requirement gathering. After project completion when the team is reassigned to another task all the provided accesses are revoked back to avoid knowledge spill overs.

4.5.2.2.4. Relationships

METPST2 works with clients all over Australia but most of their clients are situated in Victoria. The business does not work with any outside contractors or third parties. All the development work happens in-house. The 'relationship' factor for this business does not really count as METPST2 does not work with other businesses in providing its services.

4.5.2.3. Organisation and other factors

4.5.2.3.1. Sector

MEPST2 is specialised in developing customised websites based on the specific requirements of their clients. All custom website designs are built from scratch in line with client requirements. To develop webpages that are not just aesthetically pleasing but also helpful for their clients' businesses to grow, it is important for METPST2 to conduct in-depth research to understand their clients' business processes and their end users. This requires access to their clients' business documents comprising confidential organisational knowledge. The owner said that "it is our responsibility to protect our organisational value by protecting our clients' business knowledge from leakage and misuse". The business ensures that they do not share any specific organisation knowledge about their clients while pitching their previous work to their new customers.

METPST2 provide all IP rights to their clients so it is the clients who will invest in formal protection methods. For example, the business would assign the IP in any software they create to their clients including designs, content, documentation, and the source code. It is important that all this remain under the sole ownership of the client otherwise it could mean that the client could be "held hostage" by the service provider, and this could impact their services to their customers. METPST2 web content is protected using copyright. The material is intended solely for informational and promotional purposes and does not disclose any proprietary business strategies or confidential organizational knowledge.

4.5.2.3.2. Location

The business is Melbourne metropolitan based. There was no clear evidence to show a relationship between location and the implementation of KP strategies. The adopted protection strategies can be easily implemented using the IT services the business receives from Internet service providers.

4.5.2.3.3. Age of business (years)

The business was still considered to be new in the market even though they have had been in operation for seven years. The client base is still very small in size. There are quite a few services offered by the business but not all have been requested by their clients. The limited amount of business expansion over this period has meant that there has been limited adoption of KP strategies to this stage.

4.5.2.4. Knowledge Protection Strategies

METPST2 adopted a mixture of formal, semi-formal and informal protection methods. The business's own webpages are protected under copyright. It is important for the business to protect their web content, photos, and graphics. First, it provides a positive impression to their clients that the business takes security seriously. Secondly, the graphics and pictures represent some of their developed work for marketing purposes. Most of the software developed by them are provided to their clients along with their IP rights and it is the responsibility of the clients to protect them. A major part of the revenue for the business comes from developing web applications for their clients. The web applications, software and interfaces developed are mostly used by their clients for their internal business processes or sometimes used by the customers of clients. The applications are not commercial software, which means the clients of METPST2 do not sell, lease, or rent them beyond their use by clients. Moreover, all IP rights stay with the clients and any copy kept by the business is safely protected with informal protection methods such as restricted access, authentication and authorization. Hence, the applications do not require formal protection. METPST2 access their client's business documents to get an understanding of their business to provide their services and these documents are protected with a mixture of semi-formal and informal protection methods such as contracts, authorisation, authentication, restricted access and cabinet locking.

The owner of the business believes that the kind of services provided by a business requires specific protection methods to protect their client's organisational knowledge from being leaked. For example, if a company is involved in developing new designs, products or applications then they must protect their innovations with formal protection methods whereas if the business deals with providing customised services, then the organisational knowledge of their clients along with their own business strategies can be effectively protected with existing semi and informal protection methods. The owner mentioned that "the adoption of KP strategies depends on the type of services provided by the firm, but it is important for every business to have some protection mechanisms in place to protect their organisational knowledge and attain competitive advantage."

4.5.2.5. Summary

It is evident that the use and adoption of KP strategies is directly influenced by SME and other characteristics such as size (limited resources), age, owner/manager characteristics, and sector. The business believed that the size is a major factor. As size directly effects revenues, the smaller the size the less the revenue, and harder it is to spend money on KP mechanisms. Additionally, the smaller size also means limited resources that are generally devoted to core business processes. The age of the company also hinders implementation of KP strategies. At a young age, businesses are more focussed on establishing their business rather than investing in new protection strategies. The owner/manager characteristics also has a great impact on the adoption of protection methods as they mostly make decisions based on their prior knowledge, experience and skill set. The type of service provided in the sector seems to influence the (lack of) KP strategies. If the services provided are delivered digitally to their clients or if similar services are acquired by multiple clients, then it is important to protect against knowledge spill overs between clients.

4.5.2.6. Knowledge Protections Benefits

According to the owner, delivering a unique service gives the company a competitive edge, and protecting that uniqueness is vital to maintaining. Customers want unique ideas and designs and if you can provide that then you can easily sustain competition and retain competitive advantage. Along with this, protecting customer information helps in retaining and attaining new customers. Whilst the business had mainly informal and semiformal KP strategies in place, it did not have any specific metrics to measure the benefits received from them. The owner believed that the retention and attention of customers could be one of the indicators of its success.

4.5.2.7. Impact of COVID19 on KP adoption

METPST2 has been impacted by COVID19 and has seen an increase in their revenues. The business received new clients as the market had high demand for digital technologies. The business undertook new clients and was responsible for software deployments. But the pandemic did not have any influence on the adoption of KP strategies as the business could conduct most of its work online. The business required limited physical site visits which were formally approved by the client organisation.

4.5.3. Case METPST3

4.5.3.1. *General description*

METPST3 is a micro business providing financial services with three employees and four functional areas: administration, accounts, human resource, and sales. The business was established 20 years earlier in a home office set up. The interview was held with the founder/director of the business. The researcher had known the founder of the business for eight years. The interview was held at the director's office and lasted for 45 minutes.

Companies in Australia are required to be registered with Australian Securities and Investments Commission (ASIC). Financial services provided by METPST3 cover specialized services in accounting, taxation, ASIC compliance, producing timely, accurate financial statements, advising about how to get most out of tax planning and preparing tax returns for small and medium size businesses. In addition, they assist individuals to start businesses, set up their Australian business numbers, lodge tax returns, and provide guidance on how to run the business. METPST3 also provides services such as bank reconciliations, end of year tax return preparation and financial statements preparations.

The business mainly uses a mixture of semi-formal and informal protection methods such as secrecy, restricted access, contracts and documentation, fragmented division of labour, and access privileges with limited use of copyright as one of their formal methods.

4.5.3.2. *SME characteristics*

4.5.3.2.1. *Business size*

METPST3 is an established micro business with a "decent" customer base. By decent the director means not thousands of clients but hundreds of regular clients/companies with major financial dealings. Thus, they are not a large business, which means they have limited human and financial resources. The director of the business believes that the small size and limited resources hinders the use and adoption of KP strategies. Formal protection methods such as patents and trademarks require huge initial investments in terms of time and money, which small companies with limited resources cannot afford. The business charges fees to their clients based on their taxable income and the number of tasks undertaken as specified by the local State government regulations, which means that the fees they charge are not very high for most of their customers. Hence, the director of the business thinks that it is economically not possible for the business to invest in any further protection methods.

4.5.3.2.2. Owner/manager characteristics

The owner who initially started the business has passed away and passed down his business to the current director of the business. So, it is mainly her who runs the business mostly and is responsible for making all the business-related decisions. The director of the business has 23 years of experience in the accounting profession. In her career she has worked with various large organisations. Being in the accounting industry and providing services related to finance, the respondent understands the importance of protection mechanisms. She thoroughly understands the requirement and utilization of formal and informal protection mechanisms. As director, she is mainly responsible for taking all major decisions of the business. The director is a single mother and being a “full-time mum” along with being an entrepreneur she said, “I cannot indulge in the activities which are not that relevant to the main services provided by our organisation as I do not have any more time available along with all my other responsibilities.” Hence, the business does not invest in the adoption of formal protection methods such as patents and trademark which require lengthy formal procedures and big investments.

4.5.3.2.3. Flexibility

However, the small size of the business provides a lot of flexibility in making decisions. This enables the director to have an individual level of understanding about her employees, making her aware of her employee’s strengths, weaknesses, needs and requirements. The director of the business uses this flexibility to practise informal policies economically and functionally. This is more to do with the director’s ability (due to her excellent knowledge of her employees) to employ her employees in the manner most suited to the task at hand, and to do so quickly and efficiently.

METPST3 can adopt different technologies based on their requirements and revenues earned. The business has the flexibility to restructure the existing protection methods because of its small size. For example, the business has done some office renovations and have built a separate area to store their confidential documents which are under restricted access now. The rooms and computers have been set up in ways to protect against screen access by looking over shoulders or through glass doors.

4.5.3.2.4. Relationships

METPST3 is an SME that does not work closely with other organisations. The main external communication partners are their clients. To provide the services that business offers they do not need to share their client details with each other. The business provides references for other businesses such as finance planners, brokers etc. but they do not get involved with

any interactions that happen between these external parties and interested clients. Hence, their relationships with these external organisations do not impact the adoption of their protection strategies.

4.5.3.3. Organisation and other factors

4.5.3.3.1. Sector

The kind of services that METPST3 provide do not require patents nor trademarks as they do not develop any new designs or products. Any client facing documents that contains original content generated by the business is protected using copyright law such as tax guides, financial guides, website content, custom financial statements etc. Copyright is also used to protect any training manuals, video descriptions created by the business as well. The business only needs to protect their documented knowledge which is mostly protected with semi-formal and informal protection methods. Their applications, documents and databases are effectively protected with the methods they have currently in place. The business is mainly responsible to provide customised services to their clients and their documents mainly constitute their business information not business knowledge. The documented business policies and procedures are kept in locked cabinets under restricted access. The owner of the business mostly uses the tacit knowledge stored in her memory acquired over years of experience to provide services to their clients. As the owner of the business is mainly responsible for dealing with most of the core business activities, there is no direct industry sector factor that impacts the adoption of KP strategies.

4.5.3.3.2. Location

All METPST3's IT support is outsourced. Being based in the Melbourne metropolitan region the director noted (in response to being asked) that "we never realised that location of the business could be a factor in the use and adoption of KP strategies". IT services are readily available in the area where business is situated and as IT services can be provided online, the services they rely on are not affected by the geographic location.

4.5.3.3.3. Age of business (years)

The business has been established for 20 years, starting as a home-based business which was later restructured and re-registered as a commercial business. This change was introduced because their business dealings had increased, and they needed a more formal organisational structure in place. This also called for extensive protection mechanisms to be put in place including copyrights along with other informal and semi-formal protection methods. As the office is geographically situated away from the owner's home, the office

needed some informal protection methods such as locks, restricted access, video surveillance and password locked computer systems.

4.5.3.4. Knowledge Protection Strategies

The business uses copyright law to protect some of their original documents such as tax guides, financial guides, training manuals, website content, flyers and pamphlets. The forms and documents for preparing financial statements and tax returns, and all other digital documents are protected with other informal and semiformal protection methods like passwords and restricted privileges. Hard copy documents are protected using cabinet locking and restricted access methods. The company provides financial services which deals with very confidential information and knowledge. However, the owner believed that it does not matter what you do, it is always important to protect your organisational knowledge. She believed that protecting one's knowledge helps in sustaining competitive advantage in today's business world. The director also mentioned that the business had acquired new customers despite the "high" fees charged as compared to "competitors across the street. This could be because of how I do my business which includes keeping customer privacy and security as a priority". Many of the business strategies for METPST3 are tacit which the owner of the business has acquired over time, and they do not require any formal protection mechanisms. The other employees of the business prepare the business documents as per the Australian taxation rules and regulations and all documented knowledge is protected using informal protection methods like cabinet locking, restricted access, division of work etc. It is worth mentioning again that SMEs tend to confuse information and knowledge and sometimes when they are referring to documented knowledge protected with informal methods, they actually mean information. All electronic policies and procedures are password protected with different privilege levels. Based on the director's experience and knowledge, she believes that the existing protection mechanisms are effectively providing the needed protection to her business.

4.5.3.5. Summary

The protection mechanisms implemented by the company were influenced by business size and their business processes. The scarcity of the resources because of the business size restricts their capacity to implement formal KP strategies. The owner/manager characteristics also plays a significant role. In this case the director of the business, with years of experience, does not feel the need for formal protection methods to protect her ways of providing services to their clients mostly using her tacit knowledge. Age has also impacted the business' KP adoption in terms of expansion, which occurred over time. As the business expanded, the need to have a formal office and more secure ways to keep their documents safe has also

arisen. The industry sector does not seem to directly affect KP adoption for this business. The organisational documents require protection just like any other business. The director of the business believes that protection methods like cabinet locking, restricted access, authorizing different privileges to other staff provides the required protection to business knowledge

4.5.3.6. Knowledge Protections Benefits

The implementation of protection methods helps the business to build trust and rapport with customers. Financial services require access to key personal information such as financial details, working details, and personal details. This information is used and inputted into various government systems and documents to lodge tax returns, develop financial statements, prepare compliance documents. This developed knowledge is protected by the business using informal and semiformal protection methods. The business ensures their clients that the information they provide will be kept safe. They have included their privacy and security clauses in the forms and documents which are provided to their clients. The director believed that the use and implementation of protection mechanisms helps them to retain their customers and expand their business. It also helps in sustaining competitive advantage. Although there are no formal procedures in place to measure the success of KP strategies, the director considers customer attention and retention as one of the factors.

4.5.3.7. Impact of COVID19 on KP adoption

METPST3's business overall was not impacted by COVID19 as the main services provided by the business were accounting, taxation etc. which usually required face to face meetings and signatures. But all these business processes were easily conducted online using various digital technologies available during pandemic. The pandemic did not impact the adoption and implementation of KP strategies. The existing semi-formal and informal strategies keep providing the required protection for organisational and client knowledge.

4.5.4. METPST4

4.5.4.1. General description

METPST4 is another SME with four departments and 14 employees. The business was established 29 years earlier and is a financial service provider. Their main service is to provide financial planning assistance. They help people to develop strategies to manage their financial affairs. This includes financial planning services like cash flow/debt management, superannuation, taxation advice, setting up investment portfolios, organising insurance policies, retirement planning, estate planning and to assure that all the financial assets of clients are well protected. The business enables individuals and organisations to understand

their cash flows and identify their long-term financial goals and assists them to develop plans to set attainable financial goals and develop, regular saving patterns and/or investment strategies. Retirement planning aims to ensure that the assets and pension income of individuals is sufficient to meet their retirement lifestyle needs. Insurance planning enables their clients to be effectively covered for potential risks and their consequences. Estate planning is about ensuring that the families of the clients are well looked after, and their assets are handed down to their family as per their wishes.

The interview was held with the owner/manager of the business and lasted for 40 minutes. The interview took place at the interviewee's office. The business was selected using the snowball technique. The business contact was provided by one of the other business's selected for the underlying study.

This is the one of the oldest companies included in the study and the only one which invests in the formal ways of protection like patents and copyright along with other informal and semi-formal protection methods.

4.5.4.2. SME characteristics

4.5.4.2.1. Business size

The business size is small, but they have a large customer base (nearly 150 clients with high earnings and investments). The business charges their clients based on their net earnings. METPST4 also earn commissions when they set up investment plans for their clients. The business has limited resources which is one of the fundamental constraints of a small business, but the service charges they charge are quite high when compared to other businesses in the sector so, they are economically more stable and are able to invest their resources into KP strategies. The owner of the business mentioned that "even though the smaller size of the business makes it harder for us to spend a larger portion of our revenue on protection methods, it is one of the requirements for us to maintain the privacy and confidentiality about our client's investment strategies."

4.5.4.2.2. Owner/manager characteristics

The owner of the business has almost 30 years of experience in accounting, financial planning, and other similar professional services. He has worked for various professional organisations and based on his skills and experience he has identified that in his business it is very important to protect their organisational knowledge along with the knowledge about their clients' business strategies, investment plans, estate plans and cash flow management strategies. All the required protection are easily achieved with the adoption of informal and

semi-formal protection methods. The business has dedicated people who look after their IT systems.

4.5.4.2.3. Flexibility

Like most of the other SMEs, METPST4 also reaps the benefits of flexibility because of their smaller size. The owner is generally responsible for making all major decisions regarding organisation policies and practices. The implementation of semi-formal and informal protection methods is mostly decided by the business owner.

4.5.4.2.4. Relationships

METPST4 business is mainly responsible to provide customised services to their clients. The business works with insurance and investments companies, whose products they recommend to clients. METPST4 provides detailed information about various investment options that the client could take advantage of by investing in different schemes. If the client shows interest in any of the options, the business helps them to set up their investments. The business does not charge their clients for suggesting and setting up insurance policies if they are in a low-income bracket but the clients with incomes in higher brackets pay high charges. The business also earns commissions from insurance and investment companies they work with. As this does not require the business to share any organisational knowledge with the involved companies their relationships with them do not impact their adoption and utilization of protection methods for internal organisation knowledge. But the business has access to their client's confidential information that needs protection against leakage, along with the investments plans and strategies that they develop for their clients.

4.5.4.3. Organisation and other factors

4.5.4.3.1. Sector

Unlike other firms, METPST4 do not need to invest their own financial resources in the implementation of formal protection methods. As they provide a financial planning service, they are required by legislation to be licensed by a large insurance company. Because of the license requirement, the business is forced to adopt some formal protection methods along with a mix of informal and semi-formal protection methods. They are advantaged by the company providing their license. When they pay their registration fee, they are protected under their licensing companies with patents and copyrights. They can then operate under the same patents and copyrights as their licensing company. The participant said, "we are required to document our plans under the licensing company's name and all the documentation is first verified by them before it is passed to the clients". The business also adopts practices to protect their tacit knowledge. For instance, if an employee leaves their

company than they cannot join their competitors for two years. Also, ex-employees have a legal requirement as per their original employment contract to maintain the privacy and confidentiality of the company. If any data breach occurred strict legal actions could be taken against the responsible individual.

4.5.4.3.2. Location

There is no evidence to show the influence of location on the use and implementation of protection methods for METPST4. They have their own information technology department which is responsible for the implementation of informal protection mechanisms such as authentication, authorization, division of work etc. The business is situated in the metropolitan region where all the required resources are available and accessible.

4.5.4.3.3. Age of business (years)

METPST4 is a well-established business, and the owner indicated that they must regularly update their knowledge and skills to stay in business. The business has extended the provision of their services over time, and this has had an impact on the adoption of KP strategies. As the business size grew and the client base increased, they had to adopt more extended protection strategies. The business needs new policies and practices to effectively provide services to their clients and extend their market share further. Their fee structure enables them to adopt new KP strategies as the need arises. Their reputation and long time in business justify their high service charges.

4.5.4.4. Knowledge Protection Strategies

The adoption of KP strategies is influenced by the type of services provided, the age of the business, regulatory requirements to adopt KP and the revenue gained from the cost of the services that the business offers. To ensure the privacy and security of the client's policies and strategies they require proper mechanisms in place that will inhibit the stealing or leakage of organisational knowledge. The financial plans provided by the business to their clients are protected using a mix of formal, semi-formal and informal protection methods. All the documented policies and strategies are protected using copyright, cabinet locking, restricted access, fragmented division of work etc. Any electronic knowledge is protected using authorization and authentication. METPST4's owner said that the business must follow the security guidelines very strictly, as any kind of negligence can result in the loss of their license. As a professional service provider in today's world, they not only provide advice to their clients but also deliver tool-based solutions developed either in-house or in

collaboration with their regulators and collaborators. The business innovates in various areas such as generating ideas, business process, financial data, investment strategies etc. All of these are an IP asset that needs to be protected through registration.

4.5.4.5. Summary

Based on the above discussion it has been identified that the business takes protection of organisational knowledge along with the knowledge about their clients very seriously. Even though the smaller size of the business inhibits the adoption of extensive protection methods, the levels of revenue they receive and the requirement for METPST4 to adopt formal protection methods by their licensing company means that they adopt formal strategies that other businesses do not. Some other factors that also play a role in the use and adoption of protection strategies were flexibility and age of the business. The flexibility offered by the small size of the business enabled the owner of the business to use his discretion in the adoption and implementation of KP strategies. As the business has grown over time the need to adopt more extensive protection methods has also arisen. There is a need to protect archived records along with the safety and protection of new documentation.

4.5.4.6. Knowledge Protections Benefits

The adoption of KP strategies is believed by the owner to reap the benefits of competitive advantage, increased market share, customer satisfaction and trust. This has led to business growth. Organizational knowledge is one of the most important assets for every business and METPST4 suggests protecting it with whatever resources the business can afford. The owner of the business suggests that it is always worth investing in KP strategies because all the investments are paid back in the form of various *intangible* benefits like customer retention, attention, and satisfaction. However, the business does not use any formal metric to measure the success outcomes from KP implementation.

4.5.4.7. Impact of COVID19 on KP adoption

METPST4 was not severely impacted by COVID19 as the business is about providing financial advice to their clients which mainly include investment strategies, insurance policies etc. Most of these are long term policies and also investments plan and strategies were developed by the business employees while working in their allocated offices and laptops without client intervention. So, during COVID the business continued supporting their clients online without introducing any changes in their adopted KP strategies. The pandemic did not have any influence on the adoption of KP strategies as their business was always conducted online. The advisors only meet with the client once or twice in a year to explain the portfolio

structures or if any investment change requires formal authorisation. And these processes were seamlessly conducted online using digital technologies such as Zoom, Doc sign etc.

4.5.5. Case REGPST1

4.5.5.1. *General description*

REGPST1 is the first regional business in the Professional, Scientific and Technical services industry sector. The business is an accountancy firm that deals in taxation and consulting services. It is a well-established family business with three employees, fitting more into a micro size business according to the Australian Bureau of Statistics definition. The main departments in the business are accounts, office administration and bookkeeping. The main services provided by the business are individual tax returns, accounting, business services, bookkeeping, taxation, tax planning and cryptocurrency tax advice. Individual tax returns refer to the services provided to individuals on preparing their annual tax returns. Taxation is an advanced service that delves into investigating and suggesting legal strategies for the businesses. The business also provides consultancy and tax related services to start-up businesses, such as tax implications based on their organisation structure. REGPST1 assists them to implement strategies to minimise their tax payable and maximise growth and profits. Bookkeeping services are also provided by the business to assist customers to operate their businesses. by assisting them with registering their financial transactions and preparing their financial statements (such as income statements and balance sheets). Lastly, the cryptocurrency service is where the business helps individuals to understand their tax obligations with respect to their investments in cryptocurrency and assists them to correctly declare related income when submitting their tax returns. The geographic region of the business is highly focussed on farming businesses. REGPST1 had recently introduced services related to farm accounting and agribusiness.

The interview was held with the managing director of the business at the business' office and lasted approximately 45 minutes. The business manager has over 10 years' experience in accounting and taxation and had set up his own business four years earlier. The business was selected using a referral technique whereby the researcher approached the local community for business referrals. The community provided some contacts and referrals which were then approached.

The business believes in their existing adopted protection method that mainly falls under the informal and semi-formal protection methods. It mainly deals with clients' data and information; alongside the strategies their clients can implement. Hence, they are more focussed on protecting their client's confidential information. The main focus is to establish

trustworthy relationships with their clients, ensuring their privacy and providing efficient services.

4.5.5.2. SME characteristics

4.5.5.2.1. Business size

REGPST1 is a micro sized business with only three family members as employees, and this inhibits them from investing in any formal or expensive protection strategies. The lack of financial and human resources are the main barriers in the implementation of protection strategies. The business is a newly established business where they are still focussed on getting their initial investments back. Their profits are mainly spent either on core business processes or marketing strategies to reach more customers.

4.5.5.2.2. Owner/manager characteristics

The managing director of the business (who is also the owner/manager) has over 10 years of experience in accounting, taxation and client focussed business. The educational qualification of the owner manager is mainly in the accounting field. As he is primarily responsible for making all the major decisions for the business, he relies on his prior work experience to identify the strategies that will benefit the business. From his past experience he has learnt that the business needs reliable protection methods to provide the necessary protection. According to him, reliability comes from the ability of the adopted method to provide protection against leakage. It is not necessary that only expensive and formal protection methods can provide that reliability. The owner/manager noted that simple protection strategies such as using password protected digital documents can be safer than relying on copyright law to protect the contents of documents. His knowledge and prior experience greatly impact his decisions about the selection, adoption and implementation of protection strategies. The owner/manager of the business mentioned, “I 100% agree that protection is required against sensitive data that we deal with. We cannot share client’s data and information with anyone but what we are doing at present to have that protection in place is enough.”

4.5.5.2.3. Flexibility

REGPST1 is a family-owned micro size business with a flexible organisation structure. The smaller size of the business offers the flexibility available to many businesses of this size. This enables the business to have a dynamic decision-making process, which means that they can quickly make decisions based on their needs. The adopted organisation structure is owner-operated where ownership control is with the husband and wife owning the

business. All major decisions including the decisions to use and implement KP strategies are made by the business owners.

4.5.5.2.4. Relationships

REGPST1 is a professional business that mainly provides services to different clients based on their requirements. The business generally does not work with external partners or contractors. Their only external communication is with their clients, where they are required to have access to their financial and business information. Hence, the business is responsible for the protection of their client's information and data. To provide effective services to their clients requires the business to share knowledge internally between their employees. This enables their employees to acquire tacit knowledge over time with experience. The business adopts various informal protection methods to protect against any knowledge leakage that could happen with employees leaving or sharing that knowledge outside the organisation boundaries.

4.5.5.3. Organisation and other factors

4.5.5.3.1. Sector

The industry sector of the business is more focussed on providing client specific professional services, which generally does not develop any new product or design. The main services provided are tax related services such as tax advice, lodging tax claims and bookkeeping services. Most of these services depend on the information related to their client's financial data and information. The business mostly invests in the protection of their clients' documents such as tax claims, financial data etc. Most of the data and information needed to provide these services is in the public domain. Government websites such as the Australian Taxation Office (ATO) provides information about their tax regulations on individuals and business corporations, which is publicly accessible. Hence the business mainly relies on their knowledge and experience in helping their clients by suggesting ways to invest and save. The business also helps other SMEs to focus on their core business processes by providing bookkeeping services. Hence, again the protection strategies for REGPST1 are mainly focussed on protecting their client's data and information.

The taxation department is government regulated and all business require formal audits to assess their business process to be able to operate and practise. This is also a requirement for REGPST1. The owner of the business mentioned that they had an external audit (ATO) recently where they were asked similar questions as they have been asked for the purpose of this study such as, "what protection strategies have they in place? How does the business ensure safety of their client data and information?" and similar questions. Thus, the sector

the business is in does influence its investment in the implementation of protection strategies.

4.5.5.3.2. Location

Although the business is based in regional Australia, they still have access to the main utilities required to set up an office space. Most of the business communication happens digitally such as document sharing, lodging tax returns, developing investments plans etc. The digital set up and online presence was performed and maintained by an outsourced international third party. Hence, it can be said that the geographic location of the business does not have any impact on the adoption of KP strategies.

4.5.5.3.3. Age of business (years)

The business had only been established four years earlier. At the time of interview their main focus was still on expansion and growth. The business owners only moved to the regional area after completing their education in one of the Metropolitan cities. So, along with the business growth they are also busy identifying the scope of their business. They are still trying to determine where they are heading, so at this stage they are exploring the scope of what they do and how they can expand rather than exploring and implementing more protection strategies.

4.5.5.4. Knowledge Protection Strategies

REGPST1 mainly relies on a combination of informal and semi-formal protection methods. The business forms and documents used for preparing investment plans and so forth are all protected under copyright. All other digital documents such as tax lodgments, proof of expenditures etc. are protected using a variety of semi-formal and informal protection methods such as passwords, restricted access and encryption. All paper-based documents are protected using locked cabinets. All files and documents are kept in the business office with video surveillance and restricted access office area. The owner of the business mentioned that, “the business services that we provide are very generic in nature and are in the public domain. The competition lies in our experience, knowledge and skills that we gain over time. And, they are very hard to steal.” The business protects this tacit knowledge using contracts, trust and healthy employee relationships. Every employee has to sign a contract where they agree not to open their own business, join competitors within 25-30 kilometers of the business and/or poach (recruit) the business’ employees. The business believes that at present they have all the required protections in place.

4.5.5.5. Summary

The implemented protection strategies by REGPST1 mainly fall into semi-formal and informal protection methods. The main factors that influence the choice of their protection methods are their smaller size, owner/manager characteristics, flexibility, relationships, industry sector and age of the business as represented in the summary table 11. The smaller size with limited resources and young age of the business restricts them from investing in expensive time-consuming protection methods. On the other hand, the educational background and the knowledge and skill acquired over time by the owner/manager of the business also influences his decisions about the use and adoption of protection methods. He is naturally inclined towards methods that he has seen successfully implemented in similar businesses. The flexibility offered by the small size of the business also has an impact on the adoption of their KP strategies. The business does not need to follow any rigid protection mechanism, rather they can adopt methods as per their needs at short notice. The industry sector of the business also has a major impact on the adoption of their KP strategies. The professional services the business provides has information available publicly on government websites and accessible free over the telephone so their main marketing strategy focuses on providing time savings and suggesting ideas for tax claims. It is worth mentioning again that, similar to other interviewed businesses, this business confused KP with information protection multiple times.

Table 11: Cross case Analysis Summary - Professional, Scientific & Technical Services

Factor	Sub-categories	Observed Pattern Across Cases
SME Characteristics	Size	Even micro firms adopt KP due to the sensitive nature of client knowledge; size constrains investment in formal KP but not awareness of its importance.
	Owner/Manager characteristics	Professional ethics, regulatory awareness, and prior industry experience strongly drive KP adoption and consistency.
	Flexibility	High flexibility allows rapid adaptation of KP practices without formal systems or dedicated IT departments.
	Relationships	Client-centric relationships dominate; strict confidentiality obligations shape KP practices more than competitive pressures.
	Industry Sector	High exposure to confidential, regulated, and client-specific knowledge increases the perceived necessity of KP.
	Age	Age has limited impact unless accompanied by business expansion, increased regulatory scrutiny, or service diversification.
	Location	Minimal influence due to digitally mediated service delivery.
KP Strategies	Formal	Selective use of formal KP driven by regulatory or licensing requirements rather than innovation protection.
	Semi-formal	Strong reliance on contracts, restricted access, and documented procedures.
	Informal	Secrecy, ethical conduct, trust, and controlled disclosure are central to KP.

KP Benefits	Perceived Benefits	Enhanced client trust, professional credibility, compliance assurance, and sustained long-term relationships.
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4.5.5.6. Knowledge Protections Benefits

Even though the benefits offered by the KP methods are not formally measured, implementing protection methods proved to be beneficial for REGPST1. Financial services rely on access to critical personal data, including financial records, employment information, and personal details. This data is utilized in various government platforms and documentation to file tax returns, create financial reports, and prepare compliance-related documents. The organization safeguards this knowledge through a combination of informal and semi-formal protective measures. The organization assures clients that their information will remain secure. Privacy and security clauses are incorporated into the forms and documents shared with clients. It is protected under privacy laws and data protection regulations (e.g., GDPR, Australia's Privacy Act). The director believes that implementing effective protection mechanisms not only strengthens customer trust but also supports business growth and sustains a competitive edge. While no formal metrics exist to evaluate the effectiveness of their knowledge (and information and data) protection strategies, the director views customer engagement and loyalty as key indicators of their success.

4.5.5.7. Impact of COVID19 on KP adoption

This section was not relevant to this business case as the interview was conducted post-COVID. Hence the collected data already had their context covered.

4.6. Retail and wholesale industry sector

The retail and wholesale industry sector include businesses that are involved in either selling of goods or providing services to consumers. For retail businesses, the selling of the goods could be either in the traditional way using brick and mortar stores or using various ecommerce platforms. The different types of businesses that are included in this industry are: electrical, electronic and whitegoods, floor coverings, furniture and houseware, food and grocery, fuel, hardware and building supplies, motor vehicle, trailer parts and accessories, clothing and footwear, personal accessories, pharmaceuticals and cosmetics, recreational goods, textiles and books, magazines, paper and office supplies. Wholesale trade businesses are not retail businesses as although they do not produce their products themselves, they rely on suppliers from whom they purchase their goods **in bulk** and then re-sell them to other businesses, other retailers and (sometimes) directly to the consumer (Australian Government 2023).

The Retail and wholesale industry sector was one of top five contributors towards the Australian economy in the five years up to 2022. According to the Australian Bureau of Statistics (ABS, 2022) the retail industry was the third largest contributor toward Australian economy with \$6.1b growth in industry earnings overall. The Australian Bureau of Statistics (ABS) have also predicted that employment in the retail trade in February 2018 was just over 1.3 million people which had further increased by 3.8% in 2021. This makes retail employment almost 11% of the Australian workforce. As one of the biggest employers in Australia, any changes in the industry are likely to impact a significant number of workers. Retail trade has shown an increase in all key data items from an Australian growth perspective. For instance, the industry has seen an increase of 8.4% in both sales and services income as well as industry value added.

The retail industry is a very fast paced, changing industry as it is highly driven by consumer needs. This trend has been pronounced during the recent years when the study was conducted. With the world being in a very dynamic state, retail outlets have been compelled to reconsider their long-standing processes and tactics to keep with the global changes in management and handling of supply chains (Assosia 2018). The changes introduced during the pandemic such as lockdowns were removed and businesses were returning to their normal self. Many businesses retained their ecommerce strategies especially in this sector as people were more used to online shopping. Not just this, the retail and wholesale trade services industry also require a range of licenses, permits and approvals to operate in areas such as erecting/displaying signage, playing video/sound recordings, preparing and selling food, selling and distributing alcohol, selling tobacco products, disposal of waste, importing goods, zoning permits, noise restrictions, restricted trading days and hours, handling storage and use of chemicals etc. (Australian Government 2023).

For some of the permits and approvals, businesses need to register with Australian Industry Chemicals Introduction Scheme (AICIS) if it deals in importing industrial chemicals for items such as: soap, cosmetics, paint, glue, printing ink or cleaning products. As these businesses have very specific goods and services tax measures, they are also required to register with the ATO. To employ staff the business needs to adhere to Australian's national workforce laws specific to the industry sector. Some of the environmental issues that businesses in the industry sector should understand are state based plastic bag ban, waste management and reduction, environment labelling for electrical products, recycling, reporting and sustainability.

Table 12 provides some detail of the businesses in this sector that participated in the data collection of the study.

Table 12: Details of Retail and Wholesale industry sector businesses by researcher

Business code	Retail and Wholesale Industry sector			Age (in years)
	Employee number	Number of departments	Type of Services	
METRTL1	4	4	Floor coverings, furniture and houseware	5
METRTL2	3	3	Watch spare parts, watch repairs, watch accessories and watch servicing	15
METRTL3	3	2	Grocery and convenience store, selling grocery products, money transfers etc.	6
METRTL4	8	4	Curtains, blinds and shutters	6
REGRTL1	7	4	Rubber store, selling rubber products, pools, foams and consultancy service	5
REGRTL2	4	2	Grocery and convenience store, selling grocery products, money transfers etc.	12

4.6.1. Case METRTL1

4.6.1.1. General description

METRTL1 is the first business selected from the retail and wholesale industry sector. The business falls under the category of a micro-business with four full time employees and a team of contractors. The business has four departments, the ordering department (dealing with imports), logistics, sales and accounts departments. The main services provided by the business are wholesale and retail of floor covering and furniture sales direct to customers, along with installation and consulting services such as advising or referring customers for professional installation of flooring and advising about customised flooring. The business was established in 2019 and operates mainly in the Melbourne metropolitan area and a few regional areas. The interview was conducted with the owner/director of the business. The owner/director mentioned that the business relies on their suppliers and manufacturers for the products they sell as they are not directly involved in the manufacturing of goods. Knowledge related to the manufactured goods are generally protected by formal methods such as patents, trade secrets and design rights. The business mostly inclines towards the use of informal and semi-formal protection methods. METRTL1 does some design alterations to existing designs provided by manufacturers which they protect under copyright law, but do not create designs or design ideas “from scratch” as yet. The contract between METRTL1 and their manufacturers and suppliers provide all the rights to the manufacturer. Thus, they do not require formal KP methods. If, in a few years the business starts designing their own floor coverings, then they will think about the formal protection methods to keep their designs protected in house.

The interview was held with the owner/manager of the business at the METRTL1's business office. The interview lasted for 45 minutes. The business has mostly invested in the adoption and utilisation of informal and semiformal protection methods along with copyrights. But is certainly aware that they might invest in further protection methods if they start creating their own designs.

4.6.1.2. SME characteristics

4.6.1.2.1. Business size

METRTL1 has three equal partners. At the time of interview, the business had not generated substantial profits to use their resources on acquiring and implementing formal KP strategies. Due to their small size and limited resources, the business relies heavily on imports from outside Australia, mostly developing countries with cheap labour. The main manufacturers of the business' products are internationally located. With COVID, imports and exports faced multiple challenges due to lock downs and availability of limited financial resources worsened the situation for the business. This occurred in the initial years of business establishment when the business was focussed on the return of their initial investment and establishing the business was their main priority. The owner/director of the business mentioned that it was more important for them to establish their business and use the resources and revenue to keep the business going. Due to the lack of resources and other environmental constraints (such as, the business operating in Melbourne with goods that are imported internationally under different legislative laws) the business could not afford to have expensive time consuming KP strategies in place. Hence, the business is restricted to use its finances and other revenue for its growth rather than the protection of their organisational knowledge on a larger scale.

4.6.1.2.2. Owner/manager characteristics

Two of the METRTL1's partners have qualifications in information technology. The adopted KP strategies by the business requires a basic understanding of IT tools and techniques which these partners can easily implement themselves. All the partners also undertook some business-related courses before starting the business and learned how they can embed their existing knowledge of IT techniques in utilising the software needed for their business operations. The skills and knowledge the employees have about the use of IT tools and techniques in data, information and KP enables the business to effectively use informal and semi-formal protection methods that require these tools. This also enables them to effectively implement KP strategies. Thus, the skills and qualification of business managers/partners directly impact on the implementation of KP strategies, certainly IT related strategies.

4.6.1.2.3. Flexibility

The small size of the business offers flexibility to the entire organisation in the adoption of the new business policies and processes. METRTL1 has a flat organisational structure where there is only one layer of management (the three partners). With less layers of reporting and every manager taking charge, making decisions and taking responsibility for business success, they face less challenges or disagreements when changing or introducing a new business strategy. With METRTL1 this flat structure is fixed as there is a clear separation of duties and responsibilities among the business partners. With one manager/owner designated as a supplier manager solely responsible to handle supply chain from suppliers, sales management is handled by the second owner/manager and finance and logistics is managed by the third owner/partner. The flexibility provided by the business structure to each manager allows them to choose their own KP approaches. If knowledge requires strict protection against leakage, then informal ways of protection with higher protection are implemented. In the case of less secure knowledge sharing, the business strongly relies on informal protection methods to protect these flexible working arrangements

4.6.1.2.4. Relationships

METRTL1 relies heavily on its suppliers and manufacturers for the supply of their products. The business also works with several individual contractors and tradespeople such as floor installers and furnishers. All flooring products are provided by the manufacturer but METREL1 can alter/evolve those designs. The business does not share any of this organisational knowledge with their contractors and other tradespeople involved in providing business related services to their clients, so these inter-organisational relationships do not need any strict protection methods. All the organisational knowledge such as modified designs, changes in the patterns of finished products etc. that are shared, are mainly protected with trustworthy relationships among partners and manufacturers using strong and constant communication. However, manufacturers have access to the designs (altered by METRTL1) which they are responsible for manufacturing and supplying. All the design ideas/suggestions provided to the manufacturer are protected by copyright law and contracts. In the case of an identified knowledge leakage, the business can terminate their contract with the manufacturer and can also take a legal action for breaching the contract. The manager of the business also commented that the designs require protection against leakage from competitors within Australia only and this provides the freedom to their suppliers/manufacturers to manufacture and distribute the same designs to other businesses outside Australia without METRTL1's permission or with them even noticing. As the manufacturer keeps all the rights of the products that are solely designed and manufactured by them, they have the freedom to share and distribute their designs and products freely.

4.6.1.3. Organisation and other factors

4.6.1.3.1. Sector

METRTL1 is a retail and wholesale business that mainly relies on their manufacturers and suppliers to supply them the products which they further sell to their customers or other businesses. Along with this METRTL1 also produce their own designs which are not created from scratch, but the business takes the design ideas from other sources such as other businesses in the same sector or designs available online. It is important to mention here that this is not about flexibility or relationships, it is the industry sector that allows the business to provide new/altered designs to their manufacturers based on their (manufacturers inventory of products) existing products. The business alters the adopted designs to stamp as their own and display. For example, if a floor design is in glossy tiles, then METRTL1 slightly changes the hues and make them non-glossy. This way business protects themselves and also at the same time provide a different design to their customers. However, the manager has commented that, “they still do not feel the need to acquire stricter formal protection strategies such as patents, as the ideas are not completely original.” Most of the images are protected using semi-formal protection methods. The other services provided by the business such as floor installation and furnishing do not require any strict protection as they are common services provided across businesses. Moreover, this is something that is valued based on individual talent and skill of the people doing the job. No protection method is really required to protect against this as talent and skill comes with time and practise.

4.6.1.3.2. Location

METRTL1's office warehouse is located in metropolitan Australia. The geographic location of the business does not seem to have any impact on the adoption and implementation of protection strategies. Most of the protection methods adopted by the business can be implemented independent of the physical location of the office or device.

4.6.1.3.3. Age of business (years)

The business is very new in the market. In its early stage, the effect of the pandemic and limited growth had a strong impact on the adoption of KP strategies. The designs were mainly kept at the warehouse where customers can visit and select their design and then an order is placed with the manufacturer based on the customer needs. The business did not require much storage space for designs, but in recent years with a sudden growth in product demand the need for extra space and protection had increased.

With the age, growth and demand there was a need for more protection mechanisms in place. Mainly the business growth was in terms of availability of products (the business started

offering more flooring options such as timber flooring, carpets etc.) and operating from different geographic locations (opened another office at a different geographic location). Hence, there was no change in the adoption of protection strategies. The business just replicated the existing methods to the new location and products.

4.6.1.4. Knowledge Protection Strategies

The use and implementation of protection methods in case of METRTL1 is influenced by the sector, owner/manager characteristics, flexibility, relationships, size and age of the business. The business sector has an impact on the adoption of KP strategies as along with buying and selling of products, and the business also provides new designs influenced by the existing designs. All the design documents such as photoshop edits and final pictures developed by the business are saved in a digital format and are password protected with further limited restriction imposed using authentication and authorisation. In addition, photoshop images that are developed by the business are protected using Digimarc barcode technology which applies a unique identifier to photoshop images and applies copyright protection to the image. The business efficiently used informal and semi-formal protection methods for the required protection. The flexibility offered by the small size and its organisational structure allows the partners to decide on different strategies for sharing design ideas and updated distribution strategies, with the supplier providing different levels of protections such as private emails, Dropbox, Google Drive, WhatsApp etc. All the managers share the required knowledge of the centralised tools such as centralised database, intranet and official collaborative channels (such as Zoom) which are secured by VPN and restricted access. All managers have the freedom to refine their protection strategies as needed. For example, when a new design is provided by the manufacturer the partner responsible for receiving the design can decide how he would like to store and share the design details with the other partners for their feedback. With the organisation's flat structure, if the designated person/partner is unavailable then the information/knowledge is shared using even less secure channels and relaxed informal methods such as verbal communication, and files are extracted out of SAS software and are shared using WhatsApp or email. The physical designs on the actual product are also securely stored in a warehouse protected using locked cabinets, doors and rooms. The partners sometimes decide to introduce changes in the product design provided by the manufacturer, products designed by other businesses in the same sector and competitors. METRTL1 can also introduce changes in their distribution strategies. All the changed/updated designs and strategies are then shared with the supplier and are protected against leakage using semi-formal and informal protection strategies such as contracts, and restricted access/privileges. Documents might require Docu sign authorisation with password etc. For example, they could come up

with 3D design of a pattern provided by the manufacturer or change the shades or hues, providing a different representation. If METRTL1 provides a new design/appearance for tiles that they want the manufacturer to produce for them then the contract protects them against the manufacturer distributing the same design to any of their competitors in Australia. But the manufacturer can supply the same design to their clients in other parts of the world without breaching the contract signed with METRTL1. At the time, the business had no way to deal with this and also the business did not want to invest in any formal protection methods for their designs. The unwillingness to protect designs under formal methods provides freedom to their manufacturers to register the designs provided by METRTL1 under their own name.

The owner/manager of the business believes that it is important to protect organisational knowledge and managers' knowledge, and experience has an impact on KP adoption. The manager said that, "if the manufacturers or installers indulge in open communication with the competitors then there is a risk of knowledge getting leaked. Thus, the design suggestions/alterations that are shared with the suppliers and manufacturers requires protection." Such protection was mainly provided with informal protection methods such as authentication and authorisation, and these strategies can easily be implemented by the business partners based on their IT skills and knowledge. Before any manufacturing task is assigned to any external manufacturer, they are required to sign a contract which states they (manufacturer) are legally bound not to distribute the designs to any other business or competitors. It is important for the business to build trustworthy relationships and use legal contracts as another means to add security to the design ideas or images produced by the business. To maintain the privacy of the shared knowledge, all the designs are shared via email with restricted access. The business relies on signed contracts and truthful and honest relationships, but there is no guarantee that the manufacturers will not share the ideas provided by the businesses with their other customers. Furthermore, if there is any knowledge leakage then the business is more inclined to ignore this and not do anything. The business believes that if the design ideas shared with customers outside Australia, then the business will not be highly impacted by that.

The industry sector of the business also has its impacts on the adoption KP strategies. Most of the other services provided by the business and the industry sector are tacit in nature such as providing some advice to the client with the colour theme or furnishing about flooring etc. For instance, the installation process which is a general process followed by most of the floor installers is something that gains efficiency and accuracy over time and with experience. This tacit knowledge acquired over time is something that is not easy to copy or steal which is why it requires less protection as compared to the explicit knowledge documented either on paper or in digital format. The business uses copyright to protect any explicit knowledge such

as photoshop images of designs that are shared with their contracted manufacturers. The industry sector of the business does not require strict formal protection such as patent and trademarks, as METRTL1's main service is retail of floor designs to customers manufactured by external manufacturing companies and suppliers. During the early stages the business did not keep many designs and hence required limited storage space that could be protected with physical locks but with the growth the business require bigger warehouse and online presence to share their design ideas which extended their need for more protection methods in place. With growth and time (age of the business in years) the existing protection methods such as cabinet locking, surveillance cameras are extended to the new locations along with the old ones. Also, with lockdowns some of the design ideas were also kept at the manager's residential properties which were again protected using informal protection methods. Sometimes the protection is implemented in the form of digital methods such as passwords, documents with restricted access, limited access over digitally shared designs using collaborative channels using different internet connections. Hence it can be said the age of the business does not require the business to invest in new protection strategies.

Thus, the business relies heavily on informal and semi-formal protection methods to protect the organisational knowledge from being leaked such as password protected laptops and mobiles with files further protected with restricted access. Protection methods such as authentication, authorisation, file sharing with restricted access, and a centralised database set up are implemented for the needed protection. Hence, at the stage the business is able to protect their organisational knowledge using copyright law and layers of semi-formal and informal protection methods.

4.6.1.5. Summary

The business is generally inclined towards the adoption of informal and semi-formal protection methods as their protection mechanism. METRTL1's choice is influenced by factors such as their limited resources, business size and age, owner/manager characteristics, relationships with external partners and the business industry sector. Smaller size and limited resources restricted the business from investing in time consuming and expensive protection methods. The business's need to rely on external manufacturers and suppliers for the manufacturing and development of design also impose a significant impact on KP adoption. The business does not design their products from scratch and take designs produced by other businesses in the same sector, altering them slightly and signing contracts with the manufacturers for providing them the products. As the design is not an original design idea, METRTL1 does not require formal protection rather rely on informal protection methods such as contracts and trustworthy relationships to restrict their manufacturers from sharing their designs with their competitors. The sector is typified by work that requires tacit

knowledge to provide good quality and precise products, which is difficult to replicate and is easier to protect by copyright and layers of informal methods. Similarly, a flexible organisation structure and trustworthy relationships with their suppliers and manufacturers allow the business to effectively utilise mix of informal and semi-formal protection methods as per the need. The young age of the business restricts it from investing in expensive protection methods and use informal and semi-formal methods that can be easily implemented by the managers and partners with their acquired knowledge and skills.

4.6.1.6. Knowledge Protections Benefits

The owner/manager of the business mentioned that even though they do not use any explicit metric to measure the success or benefit of KP strategies, it could be said that KP is important to retain competition in the market. If the design ideas produced by the business are leaked and used by their competitors, then that would mean its market share may drop as customers can easily switch to other retailers. The owner/ manager also emphasized that due to the business being in the early stages of existence they do not have practices to identify leakage or theft, meaning that measuring the benefits (or costs) of their strategies is made more difficult. Also, the business tends to ignore when manufacturers share/leak design ideas to external businesses as they believe that do not have enough resources to take any actions.

4.6.1.7. Impact of COVID19 on KP adoption

This section was not relevant to this business case as the interview was conducted post-COVID. Hence the collected data already had their context covered.

4.6.2. Case METRTL2

4.6.2.1. General description

METRTL2 is a micro business in the retail and trade industry sector. The business is a family-owned business with three employees, two being family members and one being an external employee. The business had mainly three departments, accounts, sales and procurement. The organisational structure is a flexible open structure with very blurred lines within the various functional areas of the business. The main services provided by the business are buying and selling spare watch parts and watch accessories, repairing watches and providing different servicing capabilities such as disassembling, cleaning, oiling and polishing luxury watches. The business is a propriety limited business which is a private company structure commonly used in Australia. The business has outsourced their website development, social media marketing to a third-party Information Technology company. It was established in 2009 and has a retail shop in metropolitan Melbourne. The business mainly operates in metropolitan Melbourne through their brick-and-mortar presence, but they also operate in

other parts of Australia via online presence and catalogue mailing. The business does not manufacture anything in-house and they rely heavily on suppliers and authentic watch companies to provide them with spare parts. As the business does not get involved with the design and manufacturing processes, they do not require most of the formal protection methods.

The interview was held with the owner/manager of the business at the METRTL2's business office. The interview lasted for approximately 50 minutes. The business has only invested in the adoption and utilisation of informal and semiformal protection methods. The business might think about other protection methods if it plans to expand their business into other areas or locations.

4.6.2.2. SME characteristics

4.6.2.2.1. Business size

The owner/manager of the business mentioned that the business is a family-owned business with two brothers handling most of the business operations. Most of the tacit knowledge is shared among the family members via frequent face to face meetings. Also, their shared beliefs and values lead to effective informal knowledge sharing practices that do not require strict KP strategies in place. The owner of the business mentioned that, "We make sure employees who are not family members don't learn a lot so that they don't take that knowledge and leave the company. Being small in size, it is easy to maintain close and healthy relationships with the employees".

4.6.2.2.2. Owner/manager characteristics

The owner/manager of the business is mainly responsible for making most of the business decisions in agreement with its shareholders. As the business is a propriety limited business with two brothers as the shareholders, decisions are mostly made in mutual agreement. As none of the shareholders have any qualification in information technology nor they have any experience working with any other company, they solely depend on their own business understanding. Thus, the background skills and knowledge of the owner/manager for this business do not have any impact on the implementation of KP. The manager noted that, "it is a natural instinct to protect one's businesses' internal knowledge from its competitors. The organisational knowledge needs to stay within the business boundaries and should not be discussed with external people." The Owner/manager mentioned that the adopted strategies are normal day to day protection strategies that everyone uses in their daily life which, are mostly informal. These do not have any relation with the manager's background or skills. The manager's skills and interests are more relevant to the business area, which is selling and

supporting watches, and he uses his knowledge about the watches to keep a variety of spare parts and to be proficient in providing watch services rather than focusing on protection strategies.

4.6.2.2.3. Flexibility

For METRTL2 it is not just the small size but also the organisation structure that allows the manager of the business to make most of the business decisions. The business uses a limited partnership organisational structure where one brother acts as a general manager with all management rights and the other brother usually acts as a silent partner and does not participate in most of the day to day operational and management related activities. So, legally it is the owner/manager who has all the privileges of maintaining and managing the business. But being a family business for almost 15 years, the partners do not pay much attention to the underlying organisation structure and are more informally structured around family values and interactions. Being free from structural restrictions, the business is able to establish their protection strategies as the need arises.

4.6.2.2.4. Relationships

As a service provider METRTL2 relies on its suppliers and manufacturers for its product supply. The business works with some famous luxury watch companies and they have accounts established with a few of them in order to increase the availability of spare parts and accessories for watches. The watch company's only strategy is not to sell their products to third parties for imitation or replication. Otherwise, they do not have any say in the adoption of KP strategies. The business also uses some other consumer to consumer portals such as eBay for buying and selling their products. The business does not share any organisational knowledge in these supply chain management processes. The one employee who is not a family member only stays in the workshop that is separate from the main office to avoid any knowledge spill overs. The employee is mainly responsible for watch repairs. The only company that requires access to business information or some of the business knowledge is the company that handles the website development, online content management and social media marketing. The manager of the business mentioned that the IT company is owned by one of their close family relatives and there was never an issue of knowledge leakage. The manager accepted that he never thought to that this could lead to any organisational knowledge leakage. He added that, "the business survived for so many years without any major problems, so we assume whatever we are doing to protect our organisational knowledge is enough at the stage."

4.6.2.3. Organisation and other factors

4.6.2.3.1. Sector

Being in the retail and trade sector means the business only deals with buying and selling of products manufactured by other companies, so they do not require most of the formal protection methods. The owner of the business mentioned that, “the main thing in retail business is pricing which is not knowledge just information and all the documented information is saved with locked cabinets.”. The details about the firms who provide spare parts and products is also information. Anyone can set up accounts with watch companies or other suppliers for their products so there is nothing much that METRTL2 could do to protect this information. The other business process that mainly drives the business is the experience with which service is provided and this is something that people learn over time. For example, oiling a watch is a technique that is learned over time, if you are experienced you will provide a good service and therefore there is nothing much to protect. Moreover, such tacit knowledge is hard to steal or replicate. The owner of the business also mentioned that “the spare parts required for watch servicing require technical know-how if anyone steals them, there is little or no chance that they could reap any benefits from it until they have a technical understanding of how to use that knowledge.”

4.6.2.3.2. Location

The business mainly operates from the office located in metropolitan Melbourne. The owner/manager of the business mentioned that “the office is a simple watch repair shop which does not require any complex IT infrastructure, so location of the business does not seem to have any impact.” Sometimes the manager conducts business from home such that clients can pick their product up from home or the business deliveries are scheduled at home, but none of these activities share any organisational knowledge that requires any specific protection mechanism.

4.6.2.3.3. Age of business (years)

The age of METRTL2 does not seem to have any impact on the adoption of its KP strategies. The business was established in 2009 to provide watch repairs and services, sell spare parts, etc. and is still providing the same services. Nothing much has changed, and the same employees have been working since then. The expansion only happened with the availability of spare parts and creating accounts with new watch companies. The growth of the business in terms of product availability did not have any impact on their office location, infrastructure or organisational knowledge. The only thing that changed over the years is their experience and technical know how about the products, which is mainly tacit knowledge. METRTL2 does

not have protection mechanisms in place for tacit knowledge, they just believe in keeping organisational knowledge to themselves. The business is more focussed on increasing the products they could offer to their clients, enhancing the services they provide and selling more products. The time running the business improved their business strategies and experience but did not impact their KP strategies adoption.

4.6.2.4. Knowledge Protection Strategies

METRTL2 only invests in simple informal and semi-formal protection methods such as authentication, authorisation, cabinet locking, restricted access, division of work, cultivated commitment and loyalty and effective knowledge sharing. The business understands the importance of protecting its internal knowledge but due to the nature of the business and smaller size of the business the need for formal protection methods is not felt. The business industry sector involves selling products acquired from other suppliers and manufacturers to clients and results in little to no new knowledge generation that requires formal protection such as patents and trademarks.

One of the main business facilities provided by the business is about providing specific product related services such as watch repair or replacement of spare parts which requires knowledge and experience to handle the product. Most of this knowledge is tacit and resides in business employees' heads which is not discussed publicly outside business boundaries. Any knowledge that is shared with the outsourced company is done through reliable communication channels such as email or Dropbox which are password protected. Limited knowledge about suppliers and their pricing strategies is stored in explicit format which is protected using informal protection methods such as password protected devices (phone, laptop, computer), restricted email access, locked cabinets, video surveillance etc. Thus, the relationships with external firms do not impact the adoption the protection strategies strongly. The owner/manager characteristics do not influence the adoption of KP strategies. The owner/manager believes it is common sense for any business to avoid disclosing any organisational knowledge outside business boundaries and this does not require specific protection mechanisms in place, rather smart business skills. Moreover, the IT system handling such as website management is outsourced. The flexibility offered by the smaller size and flexible organisation structure of the business enables the owner/manager of the business to adapt their protection mechanisms as the need arises. For example, any business document can be saved in either digital or hard copy based on client and business needs and then the manager can decide how to ensure its protection. This could either be performed by saving the digital document in a password protected computer with restricted access levels or a hard copy could be placed in a locked safe. The office is also constructed

in a way that its operational staff mostly stays and works in a separate area protected with restricted access to business knowledge.

The business works with suppliers, watch companies and an outsourced IT company but most of the interactions do not involve any knowledge sharing that require strict protection mechanisms in place. The IT company responsible for the maintenance of the digital content available for marketing using online platforms also mostly deals with product specific information such as catalogue publishing and business contact information which is again more like public business information and does not impose any knowledge leakage threats. The location and the age of the business also does not seem to have any observable impact on the KP adoption. All business-related data and information are mainly handled using the Microsoft office suite or emails which again do not require any complex protection strategies. It mainly invoices and pricing that are stored in the business laptop which is password protected. Most of the business knowledge is tacit knowledge acquired by the owner/manager and his brother and they do not share this with anyone outside the business. Limited knowledge shared among the employees is protected using informal protection methods such as trust, sense of loyalty and commitment of the close-knit family business. Hence, it can be said that the location of the business does not have any impact on the adoption of KP strategies. The business protection is more related to protecting the products available in their shop or sometimes items kept at home and this is performed using the informal protection methods of cabinet locking or video surveillance. The business success relies heavily on the business owner and his brother's technical know-how and experience in providing services, which is tacit and is independent of the location of the business. With age, both technical knowledge about the products and experience grows but still remain tacit. Hence it can be said that these two factors do not influence businesses decision of investing in KP strategies.

4.6.2.5. Summary

Based on the data gathered and, on the analysis, performed, it can be said that the business does not invest heavily in KP strategies due to the lack of financial resources. The business industry sector being retail and wholesale trade of products bought from suppliers reduces the need of formal protection methods and the smaller size and limited resources allows the business to focus on increasing the product availability and demand rather than focusing on the little new knowledge that business generates. In addition, the knowledge being mostly tacit is generally hard for others to replicate and leak. The owner/manager characteristics, relationships with external suppliers and companies also do not seem to have a direct impact on KP adoption. Most of the intra organisation communication involves sharing of information and data as the owner believes that the business does not need to share any internal

organisation knowledge with outside partners. With the data and information that is shared such as products available, their prices and service charges etc. can be easily accessed and shared by people outside the business. Any leakage of this information does not impose any serious damage to the business. The flexible business structure enables the business to adapt their existing informal and semi-formal protection methods and also introduce new methods as per the need. Moreover, the adopted KP strategies are implicitly implemented such as password protected telephones, business laptop, email, locked cabinets and offices, restricted access area etc.

4.6.2.6. Knowledge Protections Benefits

The business owner strongly believes that the internal organisation knowledge is the business's strongest asset that should stay within the organisation boundaries and should be protected. But the business does not measure benefits if there are any reaped by the implementation of protection strategies. The business owner believed that their main benefit is having more spare parts available for various luxury watch brands and their pricing. This information is available to the client who can walk across the street and enquire about the prices the business competitors offer. The owner/manager of the business mentioned, "I do not think this is an issue as how often as a client did you go from one shop to another and tell them about the price their competitors are offering. In addition, if anyone decides to disclose this information then this is just information, and you can't do anything about it." The owner/manager mentioned that as a hunch, "I can say that protecting our organisation's knowledge helps us to retain our customers as the business has some long-term customers who always like to receive their services on a continuous basis." The manager added some customers even send them luxury watches worth thousands of dollars via post to get servicing or repair and then they are posted back, which shows the customer's trust in the business.

4.6.2.7. Impact of COVID19 on KP adoption

This section was not relevant to this business case as the interview was conducted post-COVID. Hence the collected data already had their context covered.

4.6.3. Case METRTL3

4.6.3.1. General description

Another business selected under the retail and wholesale trade industry sector is METRTL3. The business is a micro-business with four employees including the owner/manager of the business working as an operational staff member as well (occasionally). The business has two main departments according to the owner/manager, the accounts and the sales

management department where sales management is responsible for product ordering, stocking, shelving and selling and accounts is responsible for managing the bills and invoices along with some payroll and financial reporting. The main services provided by the business are selling of Indian groceries to consumers, as well providing international money transfer services. The business was established in 2017 and operates mainly in the south-eastern suburbs of Melbourne, Australia. The interview was conducted with the owner/manager of the business. The owner/manager of the business mentioned that the business relies heavily on their international suppliers but sometimes they also buy products from other wholesale suppliers within Australia. The business itself is not involved in manufacturing goods. The business mainly relied on informal protection methods to protect their organisational knowledge. The owner manager stated that it does not require any formal or other strict forms of protection strategies as the products sold by the business are already registered by the companies responsible for manufacturing them (such as Britannia, Haldiram, India gate and Tata Tea etc.).

The interview was held at the business's retail office with the owner/manager of the business. The interview lasted for 35-40mins. The business was selected using the random sampling technique. The researcher did not know many people in the industry sector so to acquire more participants in the retail sector random sampling was used. The researcher randomly visited some of the local retail stores in the local shopping mall and interviewed the first participant that agreed to participate in the study voluntarily. The business heavily relies on informal protection strategies with a few semi-formal protection strategies to protect against any knowledge leakage.

4.6.3.2. SME characteristics

4.6.3.2.1. Business size

METRTL3's smaller size and limited availability of resources inhibits the business from adopting any formal and more time-consuming protection methods. The owner/manager of the business mentioned that, "the business is a very small business. It's just a shop selling Indian grocery products to the locals and with just three employees and myself handling all the business, there is neither time nor resources left to invest in any formal protection methods."

4.6.3.2.2. Owner/manager characteristics

The owner/manager of the business is mainly responsible for making most of the business-related decisions and migrated to Australia to pursue a master's in business administration at a younger age. While studying he also worked in an Indian grocery store for few years and

gained first-hand experience in operating a retail shop. With the knowledge and experience gained, the business owner decided to start his own business and became the owner/manager of METRTL3. His work experience and his education has helped him to identify the unique needs of the Indian community, who form the basis of his business, by providing the everyday ingredients required for Indian cooking, sweets and religious artefacts. His work experience has also enabled him to learn about business strategies and the need for KP strategies required for the business. The owner/manager commented that during his work experience he has noticed that the Indian grocery store did not require formal protection methods, for retail (selling products to customer) they do not need patents or trademarks. The implementation of informal protection strategies at a retail shop does not require any specific knowledge or skill either. Hence, most of the protection methods can be implemented by the owner/manager himself.

4.6.3.2.3. Flexibility

METRTL3 is a micro business with a customised functional organisational structure where all employees report to the owner/manager of the business directly. The business structure enables the owner of the business to make most of the business decisions. The business is a private limited company with the owner having total ownership. The type and structure of the business provides a lot of flexibility. For instance, the owner/manager can decide to start selling a new product or stop selling a specific product. Also, the owner/manager uses his own discretion to decide the retail price of the products, “once we pay the manufacturer/supplier for the supply of the products then it is their decision to decide on the retail price depending on the profit margins of different products.” The owner was asked to elaborate on this, and he explained that, “it is completely up to me to decide on the retail price of the products, I do not need to get any approval or agreement from anyone and usually it is done based on market trends and profit margins.” The business also uses this flexibility in using and implementing KP strategies. The owner mentioned that, generally he decides on security measures that need to be implemented to protect against any knowledge leakage and in most cases the security is only required for the physical products in the store.

4.6.3.2.4. Relationships

As a grocery store, METRTL3's only relationship is with their suppliers and wholesale providers. The business uses a grocery supply agreement which is an agreement between the supplier and retailer for the supply of groceries. The agreement is mainly to have clear information set up between the two parties about delivery requirements, grocery rejection policies, payment details (such as when the supplier will be paid or when the payments can be withheld), time period for the agreement, any grocery item quantity or quality rules and

the conditions under which agreement could be terminated. As the retailer solely sells the products to the consumers, this external relationship does not generally include any organisational knowledge sharing and so does not require any KP mechanisms to be in place. The owner/manager of the business mentioned that the business mostly deals with data and information, such as selling and retail process, payments and invoices etc. These are normally protected by the informal protection methods such as authentication, authorisation and restricted access.

4.6.3.3. Organisation and other factors

4.6.3.3.1. Sector

METRTL3 operates in the retail and wholesale trade with the main business of selling grocery items to the consumers. The owner manager of the business mentioned the sector of the business has a direct impact on the adoption of their protection mechanisms. He stated that most of the grocery stores get their supplies from the same suppliers following generally the same rules. There is not much to protect except some figures such as rates at which they get their products from the suppliers which might be slightly different. This information is protected with some simple informal protection methods such as password protection, limited and restricted access etc. The owner also mentioned the business does not use any specific business strategies. Daily operational activities are also similar across various grocery stores which is regular customer service, helping customers find the products they are looking for, telling them about any special promotions, etc. There is nothing much to be protected in these operations.

4.6.3.3.2. Location

The business is a grocery shop located in the south-eastern suburbs of Melbourne serving only local customers. The business does not have any online presence or delivery services. The local community is the direct consumer of the products sold at the retail store. As the business has minimal technical infrastructure and utilisation of protection strategies, it can be said that the location of the business does not have any impact on the adoption of KP strategies. The owner/manager of the business mentioned that, “if in future I open another shop in some other suburb I do not think I would require any special protection strategies. The business would only require a locked computer and a door, restricted access or video surveillance, etc. something similar to what we presently have.”

4.6.3.3.3. Age of business (years)

METRTL3 had been in business for the previous six years, which could be considered as a very young age for businesses. The business had a large clientele amongst the Indian

community which helped the business to sustain the market and a good return on their investments. But the business did not grow much in these six years. During the pandemic period, business revenue was increased as people had a new hobby of cooking different items to pass time during lock downs, but this did not have any impact on the adoption of KP strategies. The owner/manager of the business mentioned that, “we did not see the need to adopt any KP strategies other than what they already have to protect mainly their data and information.”

4.6.3.4. Knowledge Protection Strategies

METRTL3 did not feel the need to implement any formal or extensive protection strategies for organisational knowledge and is solely dependent on the mix of informal and semi-formal protection strategies such as cabinet locking, restricted access, division of work, password protection on laptops and computers. The owner/manager of the business was very persistent on his statement that, “the business does not have many organisational strategies or knowledge that needs protection.” The retail business is mainly focussed on selling products to consumers acquired from the suppliers, this does not require formal protection strategies. The products acquired from suppliers are already registered under the manufacturing firm’s name. Mainly informal and semi-formal protection strategies are used as the protection mechanisms such as locked cabinets, password protected computers installed at the workplace, password protected laptops and restricted access provided to the employees that restrict them to access any confidential information. The smaller size of the business, owner/manager characteristics, flexible organisation structure and relationships with external suppliers and manufacturers impacts on the adoption of KP strategies but negatively. Limited employees and resources, and minimum organisational knowledge call for little to no utilization of formal protection methods. The owner/manager’s experience, his ability to make major decisions and his belief that his business does not generate or store any specific organisational knowledge has made him believe that he does not need any specific KP strategies in place. The respondent strongly believes that the business sector has a major impact on this decision as the sector solely deals in selling products to consumers, with the business mainly dealing with data and information about prices and invoices. Data and information can be easily secured with simple informal and semiformal protection strategies such as passwords and limited access if stored digitally and locked cabinets if stored as invoices in hard copy. The Location and Age of the business also do not seem to have a strong impact on the adoption of KP strategies. Grocery stores located at different geographic locations still operate in the same fashion with limited infrastructure and technology availability and are purely focussed on selling products which do not require any extensive formal protection mechanisms in place. Similarly, the age of the business in

years also has no impact on KP adoption as the business's main operational activities remain the same. They might add more variety of products or start selling products manufactured by different companies, but the underlying business processes will remain the same.

4.6.3.5. Summary

The business makes minimal investment in the adoption and use of KP strategies. Most of the identified factors such as size, owner/manager characteristics, relationships inhibit the use of KP strategies. The lack of time and resources, the previous experience and limited knowledge sharing with external suppliers and internal employees also reduces the need to have extensive protection strategies in place. Moreover, the business sector and most importantly the owner's belief that the business does not generate, acquire or store a lot of organisational knowledge inclines the business towards the use of a few informal and semi-formal protection methods such as authentication, authorisation etc. The flexible structure of the business also enables the owner/manager to decide to not adopt specific KP strategies.

4.6.3.6. Knowledge Protections Benefits

With METRTL3, the owner/manager's experience and personal belief having a strong impact on the (lack of) adoption of KP strategies suggested that there are few benefits for KP strategies to measure. The owner/manager mentioned, "the locked cabinets and passwords are mainly to protect information about invoice and payroll and not organisational knowledge. The protection of this data and information is mainly to maintain good working relationships among their employees but not to protect against any knowledge leakage." The business benefits rely on product availability, quality, retail prices and customer demand. Hence, the business requires protection against theft of mainly products, not knowledge or information. The products are generally available at similar prices at various grocery stores and customers can easily access and share that information. The owner/manager commented that, "the business will reap benefits if it is either situated in a geographic location where they are the only or the main suppliers of the product to the market or they have exceptional customer service. I do not think the business will reap any benefits with adoption of any more protection mechanisms."

4.6.3.7. Impact of COVID19 on KP adoption

This section was not relevant to this business case as the interview was conducted post-COVID. Hence the collected data already had their context covered.

4.6.4. Case METRTL4

4.6.4.1. *General description*

METRTL4 is another small business selected using the snowball technique for this SME study in the retail industry sector. The business is a small business with eight employees, excluding the owner/manager of the business who looks after the entire business. The business has four main departments (administration, design ideas, accounts and sales). The business provides services related to sales of curtains and blinds, alterations and installations of window coverings such as personalised curtains, roller blinds for windows, roman blinds, sheer curtains, venetian blinds, plantation shutters, security doors and fly screens. The business also provides services such as advising and providing interior design suggestions, free quotes, a free sample service and a professional measuring and installation service. The business helps clients in making decisions regarding blind and curtain installations, for instance, by providing free samples of chosen colours and fabrics to them that they can take them home to see them in the actual installation position. The business was established in 2017 and have completed around 5,000 different projects. The business mainly operates in the Metropolitan area of Melbourne, but they have a second branch in Sydney (another major city in Australia) as well. The interview was conducted with the owner/manager of the business. The owner/manager mentioned that the business mainly relies on their suppliers and manufacturers for most of their raw products which are sewed and installed in-house. The business receives their orders from clients and buys relevant raw materials from different suppliers and then supply those to the manufacturers. Raw materials are then converted into finished products and sent back to the business. The business then installs the curtains and blinds at the client's site. Any other installation such as motorised curtains, different types of blinds and shutters etc. are performed by the contractors hired by the business or sometimes by internal employees. The other services provided by the business are mostly installation and measurement processes. The business itself is not involved in design creation or design ideas, hence they do not invest in any formal protection methods such as patents, trademarks or design rights. The business uses social platforms for marketing purposes and any images and videos available online are under copyright protection.

The interview was held with the owner/manager of the business at the METRTL4's business office. The interview lasted for 40 to 45 minutes approximately. The business relies heavily on informal and formal protection methods mainly for the protection of data, information and their equipment, tools, raw materials and finished products, along with minimal organisational knowledge.

4.6.4.2. SME characteristics

4.6.4.2.1. Business size

The smaller size of the business in terms of number of employees, resources and revenues impacts METRTL4's adoption and use of KP strategies. The owner/manager of the business mentioned that, 'the business is in its spike and is growing its customer base, and all our employees and other resources are more focussed on meeting customer needs and expectations.' Any increased revenues are used towards business growth such as buying raw materials from the best suppliers within Australia, raw materials converted into finished products by the manufacturers based on customer requirements and delivered and installed at customers' sites with 5-year warranty. The business only utilises informal and semi-formal protection methods.

4.6.4.2.2. Owner/manager characteristics

The owner/manager of the business is primarily responsible for making major decisions. The business is a small business with no specific IT department. The owner/manager of the business does not have any qualification in the information technology area nor any prior experience working in similar businesses. The owner/ manager does have qualifications in the tourism and hospitality sector and had thus worked in a different industry sector. However, he mentioned that he spent a lot of time on online short courses and researching about retail businesses on his own. He established his company with small products and services at the start such as selling curtains and fabrics direct to public and over time the business kept expanding. The owner/manager mentioned that "the retail business deals with providing products to customers based on their needs, protection is needed for products such as fabric, shutters, rollers and finished goods." The business uses informal and semi-formal protection methods to provide the needed protection.

4.6.4.2.3. Flexibility

METRTL4 has flexibility provided by the smaller size of the business and their organisational structure. The business has a functional organisational structure where each department head directly reports to the owner/manager. Because of the smaller size of the business, some of the functional areas are only handled by one or two employees. The business does not have any executive board of directors or shareholders and this enables the owner/manager of the business to make most of the business decisions, along with the decisions about the implementation of protection strategies. The fact that the owner/manager is really the only decision maker means that he is able to make decisions about key aspects of the business quickly. This makes them very flexible.

4.6.4.2.4. Relationships

METRTL4's main services are selling curtains and blinds to customers. The business provides custom made curtains and blinds, also provides free quotes, measurements and installation of curtains and blinds. The owner/manager of the business mentioned that the, "business has selected its suppliers and manufacturers based on the quality and price of items they provide. The business is dealing with the same suppliers and manufacturers from the last six years. And the relationship is based on trust, respect and open communication." It can be said that the business respects its partners and they can make their own decisions without fear of retribution or retaliation, and share their design decisions without the fear of leakage. The communications between partners are more about the type of products, colours, fabrics and stitching designs, which does not comprise sharing of any organisational knowledge. The business also performs some simple sewing processes internally and has specific employees responsible to perform some of these operational tasks. Most of the operational staff only require access to information such as fabric, sewing style, quantity and finishing date. So, mostly it is the data and information that is shared among partners which is protected with informal and semi-formal protection methods.

4.6.4.3. Organisation and other factors

4.6.4.3.1. Sector

The industry sector in which the business operates is retail where they sell curtains and blinds to customers with additional services such as measurement and installation. Also, businesses in this sector mostly post the designs and/or videos of their installed products online which allow other businesses and the public to access and use them as their own. The business website or social platform pages are under copyright protection, but the business never formally assessed its success. The business does not invest in any manufacturing or design processes. All the fabrics and equipment are obtained from suppliers and are manufactured by trustworthy manufacturers. Some of their other equipment such as motors, curtain rods etc. are also obtained from suppliers. The nature of the business does not require any knowledge sharing about organisational strategy or specific knowledge with external partners, suppliers and contractors. Thus, the business does not feel the need to adopt any strict protection strategies. Moreover, most of the knowledge is tacit knowledge such as customer management tactics, managing relations with external partners, sewing or installation services provided by the business (usually learned over time with experience and is tacit in nature, which is hard to replicate) are again protected by informal and semi-formal protection strategies such as contracts or trustworthy relationships.

4.6.4.3.2. Location

METRTL4 operates from a warehouse where they mostly store raw materials, tools, equipment and finished products until delivery. The business can operate independent of their geographic location as most of the business deals can be initiated and finalised using online platforms and communication by telephone. The business has an e-commerce website where people can place orders and buy items. The business has clear terms and conditions regarding privacy and IP rights on the use of the website. Any person placing orders online, making payment or referring to pictures or video's available online are responsible for any transaction they perform or if someone else performs on their behalf. The owner/manager of the business mentioned that the warehouse is protected against theft with the implementation of informal protection methods. The business also has another warehouse in Sydney using the similar protection strategies. Hence, it can be said that the location of the business has no impact on the adoption of KP strategies.

4.6.4.3.3. Age of business (years)

The business was established in 2017 and had performed well over its initial six years. The business was expanding its customer base and type of services available to the customers. It had seen a growth in the number of employees as well over the years. With the increased customer base, the business required more supplies from the suppliers and has more transactions with manufacturers, but the nature of knowledge sharing and business processes remained the same. The business only had the warehouse but no office and then over time they added another story to their building with offices and storage rooms. The owner/manager of the business stated that "before we only relied on locks and security alarms but with additional offices and expansion the business also decided to use video surveillance, restricted access to certain areas with locked doors etc.". So, the age of the business and its expansion has affected the adoption of KP strategies, but the change was only to include more informal protection methods and the business still do not feel the need for formal protection strategies.

4.6.4.4. Knowledge Protection Strategies

METRTL4 relies on a mix of informal and semi-formal protection methods. The business operating in the retail industry, relies heavily on their suppliers and manufacturers for the finished products that they sell to their customers, and the business assumes that they can survive without adoption of any formal protection strategies. The business feels that their products are well protected under informal protection methods, and they do not have to worry about the stealing of their designs or design ideas as they are not designed or conceived by the business originally. The business is a just a middle party that delivers the products

manufactured by other companies to the clients. METRTL4 does not own any IP or trademarks over the products they sell to their customers. The smaller size of the business, limited resources, sector and relationships with external partners and suppliers impacts the adoption of KP strategies as the business does not usually share confidential organisational knowledge externally. It is mainly data and information that is shared, which can be easily protected with informal protection strategies such as cabinet locks, restricted access, video surveillance etc. Sometimes the business takes a risk and does not implement any protection mechanisms because the leakage of some numbers and figures in the sector does not impose catastrophic damage to the business. The owner/manager characteristics, flexibility provided by the smaller size and organisation structure, and age of the business in years also inclines the business towards less invasive protection measures. The business invests in less expensive protection methods due to its smaller size and limited resources such as locks and password protected computers (used to store data and information that requires restricted access). The owner/manager believes that the business does not need strict protection strategies. He is mostly responsible for making the major business decisions and he does not require approval from anyone to see what processes will and will not work for the business. The owner/manager also believes that at the young age of the business, "I think it is more important for the business to obtain customers and get my investments back rather than focusing on something that is not even an issue for my business at the stage. The business has not developed any unique style of curtains and blinds, it just provides the same services that every other company in this sector does." The location of the business does not seem to have any impact on KP adoption, as the business uses a warehouse to store the raw materials and finished products. The warehouse is protected using simple informal protection methods such as locks, restricted access and video surveillance. The two different warehouses located at the two different geographic locations uses similar protection methods.

4.6.4.5. Summary

METRTL4 does not invest heavily in the implementation of KP strategies. Most of the time the owner/manager referred to data and information, tangible products such as fabrics, finished products, sewing machines, samples etc. while talking about protection strategies. He thinks it is more important to protect against theft of items available in the warehouse than any organisational knowledge. If someone got access to the warehouse, they would be more likely to steal the actual products rather than try to break into computers and access files containing some phone number or invoices. In the case of METRTL4, it can be said that most of the SME and organisational factors are affecting the adoption of the KP strategies towards informal and semi-formal protection methods. Having less resources and their smaller size

restrict them from investing in expensive formal protection strategies. In addition, the business not being involved in designing or manufacturing unique designs or products is another reason for not adopting formal protection methods. The flexibility provided by the smaller size and the organisation structure inclines the business towards informal and semi-formal protection methods. The business can easily change their adopted informal and semi-formal protection strategies based on the need without going through any lengthy application and approval process. The relationships with external suppliers and manufacturers mainly deal in import and export of raw materials or finished goods along with some invoices and bills and also do not require strict protection mechanisms.

4.6.4.6. Knowledge Protections Benefits

The owner/manager of the business mentioned that, “the business does not really measure the benefits offered by the implementation of protection strategies but it is believed that protecting against theft and steal obviously provides financial protection. And, it can indirectly relate to other benefits such as improved customer relationships, customers will be satisfied if their orders are delivered on time.” The business does not use any specific metrics to measure the benefits of adopting KP strategies. The owner/manager relies on this approach and answered based on his experience and intuition. The business also does not feel the need to spend time on analysing and measuring benefits reaped from the implementation of protection methods.

4.6.4.7. Impact of COVID19 on KP adoption

This section was not relevant to this business case as the interview was conducted post-COVID. Hence the collected data already had their context covered.

4.6.5. Case REGRTL1

4.6.5.1. General description

REGRTL1 is a small sized franchise business in the retail and the wholesale industry sector. The business has seven employees and four departments. The main departments are accounts, sales, product instalments and technicians and repairs. The business provides services related to their sales of pools, spas, foam mattresses, overlays, and custom-cut foam for lounges, chairs, and cushions. They also sell other rubber-based products like flooring, mats, strips, extrusions, carpets, and artificial grass. Their pool technicians are experts in pool and spa care who provides services such as cleaning, repairs, and balancing chemicals. They also provide on-site pool care service where they visit their clients at their home and provide help with pool inspections of pumps, filters, heaters, and any other components, to ensure everything is working. The business is a franchise business

established in 2019 and is a family-owned business, with two brothers owning stores at two different geographic locations, both located regionally. The business is a retail business where they depend on the suppliers for the supply of their raw materials such as rubber but they provide customised services to their clients in the form of custom cut foams. As the business is not directly involved in the manufacturing or designing of products, they do not invest in formal protection methods. The business uses a mix of informal and semi-formal protection methods to protect their data, information and limited knowledge (expertise and tacit knowledge possessed by their employees).

The business was selected using the referral technique. The business contact was provided by the local community where the researcher has no initial contact, and it was difficult to find the participants. Initially the business was contacted by telephone where the purpose of the interview was provided along with an introduction to the researcher's background. The owner/manager of the business agreed for an interview and have to meet them in their office at a scheduled appointment. The interview was held with the owner/manager of the business in their office. The interview lasted for around 45-50 minutes.

4.6.5.2. SME characteristics

4.6.5.2.1. Business size

REGRTL1 is a family-owned business by two brothers who share an equal partnership. The smaller size of the business has a direct impact on the financial and human resources owned by the business. The scarcity of finances has pushed the business to utilise its resources for core business processes and inhibits them from investing in expensive KP strategies. With the recent impact of declining GDP of the country and increasing cost of living, the business has seen a reduction in their revenues and profits. This has made it even harder for the business and restricts their resources to be spent on the main business processes. The owner of the business also mentioned that they "recently spent a lot of money on providing training to one of their employees in one of the customised services they provide to their customers but once the employee was fully trained, he left the company." This has cost the business too. As a result, the business is limited to allocating its finances and other revenue toward growth, rather than investing significantly in protecting its organizational knowledge.

4.6.5.2.2. Owner/manager characteristics

The owner/manager of the business has qualifications in a different industry sector than their business's industry sector. He also does not have specific qualifications in the implementation of the information technology related protection strategies. The skills, knowledge and educational qualification of the owner/manager had little to no impact on the

adoption of the protection strategies. The prior work experience of the owner/manager enables him to run the daily operational tasks of the business such as selling products, providing services and preparing quotes for their customers.

4.6.5.2.3. Flexibility

Usually, the smaller size of the business offers flexibility where the business can make their own decisions with regards to their policies and processes. In case of REGRTL1, the business is a franchise business, restrained by their franchise holding company's legal structure. In this structure, the parent company holds the ownership stakes and mostly manages and controls their subsidiary's strategic decisions. The parent company is responsible for installing and providing all information technology systems required for the business processes such as computers, information systems and business portals that are responsible for storing business related data and information. REGRTL1 pays a subscription fee monthly to the parent company for these. The business generally does not maintain any paper-based documents. Most of the business-related information is available online on the holding company website. Customers can also visit the store to purchase products. Any custom designs provided by the customers (custom design for foam mattresses or rubber chairs) are also maintained in digital format using the portal provided by the parent company. REGRTL1 only enjoys limited flexibility in terms of operating independently with their own management and operations as they are under the control of the primary holding company.

Combining owner/manager characteristics and limited flexibility, the owner/manager of the business does not believe in the implementation of further protection strategies at the business level. REGRTL1 is quite content with the asset protection and risk reduction provided by the holding company. For example, if a product sold by the subsidiary company is faulty the holding company is liable to provide a replacement.

4.6.5.2.4. Relationships

Being a subsidiary of a holding company, REGRTL1 relies on the holding/franchisor company for supplier contacts (as the business can only receive their products from the approved suppliers by the holding company). The business enters into the supplier agreement and is then accountable for the payments of the purchased products. The holding/parent company owns all IP rights. REGRTL1 is responsible for selling their products to customers. The other services provided by the business such as pool health check, pool repairs and so forth that require specific expertise is provide by the trained employees of REGRTL1. The training is provided by the holding/parent company as a part of the franchising agreement and sometimes at an additional cost (if a new employee requires

training). As REGRTL1 did not design the products themselves they do not invest in protection strategies to protect IP related to product design. Tacit knowledge in the form of skills and expertise possessed by the employees is also not protected. Otherwise, any organisational knowledge is protected through semi-formal and informal protection methods such as restricted access and cultivating commitment and loyalty. Custom designs requested by the customers are shared with the manufacturer in digital format using semi-formal protection methods.

4.6.5.3. Organisation and other factors

4.6.5.3.1. Sector

REGRTL1 falls under the category of retail industry sector who heavily relies on their suppliers and the parent/holding company for their products. The parent company(franchisor) hold all the IP and trademarks on the products sold by the REGRTL1. The training required to provide the services offered by the parent company are also designed by the franchisor. Hence, REGRTL1 did not require any formal protection methods. REGRTL1 is mainly responsible for day-to-day operational business processes that are usual standard services provided by any retail business and does not require any specific protection mechanism in place. The services provided by the business such as pool inspection, water testing and so forth require special training and knowledge and is mainly tacit in nature which is hard to protect with formal protection methods. The industry sector of the business enables REGRTL1 to take the implementation of protection methods for organisational knowledge lightly. The focus is more on the protection of data, information and physical tools/equipment.

4.6.5.3.2. Location

REGRTL1 is located in regional Australia with no competitors in that region. The geographic location of a business appears to have little influence on the adoption and implementation of protection strategies. Most informal protection methods used by businesses can be applied regardless of the physical location of the business.

4.6.5.3.3. Age of business (years)

The age of REGRTL1 does not appear to influence the adoption of its KP strategies. Established in 2009 to offer a range of foam, rubber, and pool products, the business continues to provide similar products and services. Over time, little has changed in terms of structure, with mostly the same employees remaining with the company since its inception. Expansion has primarily involved broadening the range of available products and services.

The growth of the business in terms of product variety has had no significant effect on its office locations, infrastructure, or organizational knowledge base. The main change over the years has been the accumulation of experience and technical expertise, which largely remains tacit knowledge. REGRTL1 does not have formal protection mechanisms for this knowledge, relying instead on fostering strong and loyal intra-organisational relationships. REGRTL1 cultivate employee commitment and loyalty by implementing initiatives that recognize and reward long-term service, encourage professional development, and foster a supportive work environment.

4.6.5.4. Knowledge Protection Strategies

REGRTL1 recognizes the importance of safeguarding its internal knowledge and implements various semi-formal and informal security measures to do so. These include authentication and authorization to control system access, cabinet locking and restricted access for physical security, and a clear division of work to ensure accountability. Additionally, the company fosters employee commitment and loyalty while promoting effective knowledge sharing within the organization.

Due to the company's smaller size and the nature of its operations primarily selling products sourced from external suppliers and manufacturers there is minimal creation of new knowledge that would necessitate formal protections like patents or trademarks. Moreover, the holding/parent company own all the IP rights on the products REGRTL1 sells to their customers.

Along with selling finished products to public, the other services provided by the business such as pool inspection, water testing, and pool cleaning requires specific knowledge and expertise which is gained through the training programs provided by the parent company, either face to face or through online modules. The skills and experience are gained by the employees over time and are in tacit format which is hard to replicate and is mainly protected by maintaining trustworthy relationships.

Customer related data, information and custom design requirements are mostly stored in digital format and are protected using technical protection such as two factor authentication and authorisation. The business mainly focuses on safeguarding their products, tools, equipment and accessories available in the warehouse. This protection is achieved through informal security measures such as locking cabinets and utilizing video surveillance systems.

4.6.5.5. Summary

Based on the collected data and analysis, it appears that the business does not prioritize significant investment in KP strategies due to limited financial resources and its role as a franchisee. Operating within the retail industry sector and as a franchise, selling products sourced from suppliers and the parent/holding company reduces the necessity for formal protection measures. The business's smaller size and constrained resources shift the focus toward enhancing product availability and meeting customer demand, rather than protecting the minimal new knowledge generated.

Furthermore, much of the business's knowledge is tacit, making it difficult for others to imitate or leak. The characteristics of the owner or manager, along with relationships with external suppliers and companies, do not seem to directly influence the adoption of KP strategies. The owner/manager does not have prior qualifications nor experience in similar industry sectors. Limited flexibility offered by the parent holding company's legal structure of franchising also reduces the need for REGRTL1 to invest in expensive protection methods. High reliability on the parent company for the supply of the finished products and training to the employees also reduces the need for protection methods.

The information shared with customers such as product availability, pricing, and service fees, is easily accessible to individuals outside the business through their web pages. However, any potential leakage of this information poses minimal risk to the business's operations. Hence, the business is inclined towards the implementation of implicit KP strategies, such as password-protected devices (desktops installed in the warehouse by the parent company), two factor authentication required by the employees to access the business portal, locked cabinets and offices, and restricted access areas.

4.6.5.6. Knowledge Protections Benefits

The business owner does not generally believe in the implementation of strict protection strategies. He thinks that most of the services provided by the business are standard and do not require any protection. The business does not generate any specific knowledge that requires protection, so the focus is not organisational KP but rather physical asset protection through the use of informal protection methods. The owner of the business talked about an incident where the business spent money on getting one of their employees trained in providing business specific services, but the employee left the business after a short while. He said, "we could not do anything about it as we do not have any specific contract in the clause to inhibit employees from leaving the organisation nor do we have the time and the capacity to do something about it. Similarly, we do not have the resources to measure the benefits reaped from the protection mechanisms for KP. For these reasons the business

does not formally measure the success of its KP strategies. But we definitely reap benefits for safety measures to protect against stealing and theft and these can be measured tangibly.”

4.6.5.7. Impact of COVID19 on KP adoption

This section was not relevant to this business case as the interview was conducted post-COVID. Hence the collected data already had their context covered.

4.6.6. Case REGRTL2

4.6.6.1. General description

Another business selected in regional Australia is a retail and a wholesale grocery business that falls under the category of a micro business. The business has four employees in total including two family members and two are external who work mainly in sales department. They both have worked with the business for a long time. The business was established in 2012 and has an established customer base. The business is primarily divided into two key departments, as outlined by the owner/manager: the accounts department and the sales management department. The sales management team handles tasks such as ordering products, managing inventory, stocking shelves, and overseeing sales. Meanwhile, the accounts department is responsible for processing bills and invoices, managing payroll, and preparing financial reports. The core services offered by the business include selling Indian and Pakistani groceries to customers, provide international money transfer services and freshly baked cakes and pastries, along with some home cooked meals. The business also takes bulk orders for Indian sweets that can be catered for special occasions. The business has a bricks and mortar stored in regional Victoria. Due to the absence of any online presence the business’ main customers are from the local community only. Most of the products sold by the business are provided by international suppliers, manufactured by registered overseas companies such as Pattu, Shan, Katoomba and MDH. The owner manager stated that the business does not require any formal or other strict forms of protection strategies as the products sold by the business are bought from other manufacturers who already have designs registered under their name.

The interview was conducted with the owner/manager of the business. The owner/manager’s contact was provided by the local community. The local community Sikh temple was reached to acquire potential business contacts. The selected business was one of the contacts. The interview was held at the owner’s office and lasted around 40 mins. The business mostly uses a mix of semi-formal and informal protection strategies.

4.6.6.2. *SME characteristics*

4.6.6.2.1. *Business size*

REGRTL2 is a micro sized family-owned business with limited resources. The smaller size and restricted availability of resources inhibits the business from investing in expensive and time-consuming protection strategies. The owner of the business mentioned that “the business is a grocery store so protection is needed to protect the theft of the stock available in the shop rather than any specific KP strategies.” The business is more focussed on meeting the increased demand for their products by the community.

4.6.6.2.2. *Owner/manager characteristics*

The owner/manager of the REGRTL2 is mainly responsible for making all the major decisions regarding business policies and procedures. He has IT qualifications and, as well as managing the business, works as a network engineer with an IT based company. The owner/manager also earned a diploma in business management, before he decided to start his own business. His diverse educational qualification and experience enabled him to understand that his business does not require formal protection methods. The semi-formal and informal protection methods that the business implements can be easily implemented in-house. His work as a network engineer has enabled him to set-up all the IT systems himself. The business does not have an IT presence such as a website or any other social media account designated specifically for the business. The business owner/manager uses his own social media account sometimes to market special offers and discounts.

4.6.6.2.3. *Flexibility*

REGRTL2 business is a family-owned business in a partnership. The two partners are husband and wife who own the business. The wife also looks after the business by being involved with the in-house cooking such as baking cakes, pastries and sweets. Partnership businesses require all the partners to be equally liable for business decisions and require partners to enter into a formal agreement. REGRTL2 also has an agreement in place but being a family business for a long time means that decisions can sometimes be made by one partner (whilst ‘assuming’ agreement from the other). There had been no disputes between them. For example, the husband decided to implement biometrics in the form of fingerprints to restrict access to certain facilities and received full agreement from his wife. In addition, the wife has decided to add a new dish to her freshly baked products without asking for a formal agreement from the husband. The owner/manager of the business noted: “we understand each other capabilities and we use them in favor of the business so there is nothing to dispute about. If I know something because of my skills my partner will support

that decision and vice versa.” Biometrics are added as a nice to have feature as the business owner possess the required knowledge to implement this. It mainly saves against product theft not KP. The other employees follow the implicit hierarchical structure where they have to report to the owner/manager for their daily operations. This flexibility offered by the small size and the organisational structure of the business has enabled REGRTL2 to adopt and implement KP methods as their need arises without lengthy procedure of application and approval.

4.6.6.2.4. Relationships

As a grocery store, REGRTL2’s primary external relationship is with its suppliers and wholesale providers. The business operates under a grocery supply agreement, which outlines the terms between the supplier and retailer for providing grocery products. This agreement clearly defines business details such as delivery requirements, policies for rejecting goods, payment terms (including when suppliers will be paid or conditions under which payments can be withheld), the duration of the agreement, rules regarding the quantity and quality of grocery items, and the conditions for terminating the agreement. Since the retailer’s role is solely to sell products to consumers, this external relationship typically does not involve sharing organizational knowledge and, therefore, does not necessitate specific KP measures. Similarly, the other services such as selling fresh baked products and the money transfer facility also do not involve any organisational knowledge sharing with external parties with just sending/receiving money and customers buying the finished product. The cooking recipes are shared internally with supporting employees only. According to the business owner/manager, the store primarily handles data and information related to sales, retail processes, payments, and invoices. These are generally secured using informal protection methods like authentication, authorization, and restricted access.

4.6.6.3. Organisation and other factors

4.6.6.3.1. Sector

REGRTL2 falls under the retail and wholesale sector, with the business mainly concentrating on selling grocery items to local customers. The manufactured goods sold by the business are supplied by their external offshore suppliers. The business is also expanding on selling their in-house manufactured products (such as baked goods) to their regular customers along with the money transfer facility. Selling manufactured goods that are already registered under other company names and transferring money does not involve any knowledge application or generation, so the business does not invest in protection strategies for these processes. However, the manufacturing of in-house products requires knowledge such as baking and cooking skills. This knowledge is mainly tacit in nature which is protected mainly with informal

protection methods. The day-to-day operations of the business such as restocking, customer services and so forth involve dealing with data and information. The business owner believes in the protection of data, information and physical products more than organisational KP. He mentioned that, “the products process is publicly available but not the profit margin rates or discounts and such information need protection from leakage to competitors. Cooking recipes are easily available on various public websites but the final product is not, which requires protection against theft.” The business uses a mix of semi-formal and informal protection methods to provide the needed protection to the business.

4.6.6.3.2. Location

REGRTL2's main business is in the form of a physical shop, including a warehouse for storage. The business does not have an online presence but uses social media posts for product promotions occasionally. The business' geographic location causes a lot of local competition with another grocery store which is located just 50 meters away. However, the location of the business does not have a significant effect on the adoption of KP strategies for the protection of organisational knowledge. The close proximity of the competitor requires REGRTL2 to focus more on the protection of data, information and theft of products.

4.6.6.3.3. Age of business (years)

The business is an established business with 13 years of experience. As REGRTL2 is situated in a regional area (and with minimal competition) is not highly concerned about market share and growth. The business operates in the area with a high percentage of community relying on their supply of ethnic grocery items. Migrant communities are increasingly running their own events and often order food from the grocery, increasing their sales. The business requires more supply of products and this increases the sale of fresh baked and cooked food items by REGRTL2. The growth of the business in terms of the increased demand of the product does not impact the adoption of KP strategies to protect against knowledge leakage.

4.6.6.4. Knowledge Protection Strategies

REGRTL2 is a business that relies solely on a combination of informal and semi-formal protection strategies for organizational knowledge, such as cabinet locking, restricted access, division of work, and password protection on laptops and computers. The owner/manager firmly believes that the business does not possess significant organizational strategies or knowledge that requires protection. As a retail business focused on selling products to consumers sourced from suppliers, formal protection strategies are deemed

unnecessary. The products obtained from suppliers are already registered under the manufacturing company's name.

The business employs mainly informal and semi-formal protection mechanisms, including locked cabinets, password-protected computers and laptops, and restricted access for employees using fingerprints to prevent unauthorized access to confidential information. The small size of the business, the characteristics of the owner/manager, the flexible organizational structure, and relationships with external suppliers and manufacturers inhibits the adoption of KP strategies. Limited employees and resources, along with minimal organizational knowledge, result in little to no use of formal protection methods.

The owner/manager's experience, decision-making ability, and belief that the business does not generate or store specific organizational knowledge have led to the conclusion that no specific KP strategies are needed. He strongly believes that the business sector influences this decision, as it primarily involves selling products to consumers and handling data and information about prices and invoices and storage of goods. These items can be easily secured with a mix of informal and semi-formal protection strategies, such as passwords and restricted access for manufactured products, and locked cabinets for hard copy invoices.

The location and age of the business also do not significantly impact the adoption of KP strategies. Grocery stores in different geographic locations operate similarly, with limited infrastructure and technology, focusing on selling products without requiring extensive formal protection mechanisms. Similarly, the age of the business does not affect KP adoption, as the core operational activities remain unchanged. But the business does need to protect their data, information and inventory items stocked at the warehouse.

4.6.6.5. Summary

REGRTL2 does not implement KP strategies formerly. Many factors such as the smaller size of the business, owner/manager characteristics, flexible organisation structure and internal and external organisational relationships has a direct impact in the adoption of KP strategies. Table 13 provides a quick summary of findings which will be later discussed in detail in the analysis chapter. The smaller size of the business inhibits the business from investing in formal expensive time-consuming protection methods. The knowledge and owner/manager's work experience enables him to make decisions about the implementation of protection strategies. His background identifies that the retail business does not need to invest in strict protection methods due to the lack of knowledge generation. The flexibility provided by the smaller size of the business in the organisation's reporting and decision-making structure enables REGRTL2's owner to make decisions about the adoption of KP strategies. The information and knowledge sharing between employees did not involve confidential

organisational knowledge sharing such as product pricing and cooking recipes. Thus, the business is inclined towards the use of informal protection methods to protect other data and information. Other organisational factors such as industry sector, geographic location and the age of the business also favours the implementation of informal and semi-formal protection methods. In this form of retail, where the business mainly deals in buying and selling of products with limited to no new knowledge generation, the business only requires the adoption of a mix of semi-formal and informal protection methods. The geographic location and close proximity of competitors did not have a significant impact on the adoption of protection methods against knowledge leakage but product safety and theft. Lastly, the age of the business and the growth has caused the expansion in the product availability and implantation of protection strategies to protect against their theft only.

Table 13: Cross- Case Analysis Summary - Retail and Wholesale Sector

Factor	Sub-categories	Observed Pattern Across Cases
SME Characteristics	Size	Small size and thin margins severely limit KP investment; focus remains on protecting physical assets rather than organisational knowledge.
	Owner/Manager characteristics	Practical experience outweighs formal KP expertise; KP is viewed as common-sense security rather than strategic activity.
	Flexibility	High operational flexibility but low motivation to adopt formal KP due to limited perceived knowledge value.
	Relationships	Supplier-driven relationships dominate; minimal organisational knowledge is shared externally.
	Industry Sector	Products and designs are owned by manufacturers; retailers generate little proprietary knowledge requiring formal protection.
	Age	Business age rarely alters KP approach unless expansion introduces new storage or distribution risks.

	Location	Location affects theft risk rather than knowledge protection requirements.
KP Strategies	Formal	Almost no use of formal KP mechanisms.
	Semi-formal	Limited use of access controls and basic documentation practices.
	Informal	Dominant reliance on locks, passwords, surveillance, trust, and rest
KP Benefits	Perceived Benefits	Business continuity, loss prevention, and customer confidence rather than innovation-based advantage.

4.6.6.6. Knowledge Protections Benefits

As REGRTL2 does not invest heavily in the implementation of protection strategies it thus also does not invest formally in measuring the benefits reaped from their adoption. The owner/manager of the business assumes that the implementation of the protection methods has helped the business in maintaining their market presence. He believes that the business is able to keep their stocks and supply safe from any kind of theft and stealing.

4.6.7. Chapter Conclusion

The study investigated 20 Australian small and medium sized organisations operating in the metropolitan and the regional suburbs of Australia to investigate their adoption and use of KP strategies. Apart from a few exceptions, the businesses mainly focus on the use of informal and semi-formal methods of protection such as authentication, authorization, secrecy, restricted access, division of work, documentation etc. Only one business (from the professional, scientific and technical services industry sector) invested in patents, and two businesses from the Construction industry invested in design rights. Most of the other businesses relied on copyright law along with layers of semi-formal and informal protection methods.

Chapter Five: Data Analysis

5.1. Introduction

In this chapter, the study results are analysed, using the theoretical framework as a basis for the analysis. Each aspect of the framework is discussed, and the results are analysed through the lens of RBV theory.

5.2. Overview

Although each interviewee had the terms 'information' and 'knowledge' explained to them, most participants did not differentiate between the two terms when discussing how they protected their knowledge (and information). They tended to talk about how they protected them both at the same time. This tendency to mix 'information' and 'knowledge' suggests that, from a business perspective, particularly in smaller enterprises, there may be little practical value in distinguishing between the two when it comes to protection strategies.

This finding raises interesting questions. Should researchers be developing frameworks that reflect this integrated perspective, especially when working with SMEs? Doing so could ensure that theoretical models are better aligned with real-world practices. However, as this study is focused specifically on KP, the researcher will continue with a knowledge focus.

5.3. SME characteristics

This section discusses the results related to the different factors in the SME characteristics aspect of the framework.

5.3.1. Business size

The size of SMEs appears to have a major impact on the use and implementation of KP strategies in this study. For this factor the businesses were split into two categories:

- 1) Micro businesses (business with five or less employees), and
- 2) Small business (businesses with 6 or more employees).

The study has seven micro-sized business and nine businesses that are either small or medium sized business.

5.3.1.1. *Micro businesses*

The smaller size of micro businesses in the study means that participant businesses faced a scarcity of resources, with businesses being generally inclined more to utilise their resources for their core business processes. The scarcity of financial resources mostly acts as barrier

and inhibits businesses from implementing formal protection strategies (Faria & Sofka 2010; Leiponen and Byma 2009; Päällysaho and Kuusisto 2011). In addition, the lack of technical and human resources acts as barriers to the adoption of formal expensive protection strategies. Micro businesses in the study avoided investing in expensive formal protection methods and instead used their resources (such as financial capital) on product and market development. A lack of financial resources, often associated with smaller businesses, negatively impacted access to technology, market research capabilities, and advertising. These limitations can also hinder effective KP, as businesses may lack the tools, systems, or expertise needed to safeguard proprietary information or implement formal knowledge management practices. Instead of allocating financial resources toward implementing KP strategies, businesses often prioritized allocating resources to expansion and growth. For these businesses, financial resources were mostly used for business expansion, which could be in the form of acquiring, designing, developing or implementing unique designs with respect to the business industry sector.

Micro businesses in the study had a scarcity of human resources. With a smaller number of employees, the division of work was mostly unclear. Employees were generally required to undertake multiple responsibilities, and this forced the businesses to pay them well. The scarce resources lead to fewer employees, and this meant they performed multiple tasks and being micro sized businesses, employees built close-knit working environment and trustworthy relationships with each other. As no one was held solely responsible for carrying out a project, a process or task, then participation, trust and contribution was enhanced. Additionally, employees provided informal protection methods such as cultivating commitment and loyalty, effective sharing of information and so forth, often without the businesses realising this. For example, over time the employees of the businesses developed a sense of loyalty and responsibility to keep organisational knowledge protected from any leakage. Along with this they also developed a sense of trust and healthy relationships with their colleagues and supported each other by undertaking each other's responsibilities. Sharing responsibilities required information and knowledge sharing and the employees undertook extra precautions to protect organisational data even it was not documented in the organisational policies and procedures.

5.3.1.2. 'Other' small businesses

Other businesses in the study that were either small or medium sized businesses also faced resource scarcity. The lack of financial, technical and human resources acted as a barrier in the adoption of formal expensive protection strategies. The small and medium sized businesses were inclined to use their finances and time on gaining more understanding about

the use and the implementation of cheap, easy to implement and freely available informal and semi-formal protection methods.

Whilst having more employees than micro businesses, the (still) small number of employees enabled SME owner/ managers to know each of their employees personally and allocate roles and responsibilities based on their skills and knowledge. With a greater separation of tasks, the businesses were able to implement semi-formal and informal protection methods such as division of duties, restricted access and so forth. The employees in specific functional areas worked closely with each other, which delivered opportunities to build trust and cultivate commitment and loyalty. These businesses also utilised semi-formal and informal protection strategies without even knowing they fit these categories of KP strategy adoption.

5.3.1.3. Summary

It was clear from the data that business size was a factor for the SMEs in the study, with micro businesses being even more restricted. The scarcity of resources in micro businesses restricted them from adopting even some semi-formal protection methods and they were inclined more towards informal protection methods. The adopted informal protection methods were mostly implemented within business processes. Both micro and small businesses depended upon external contractors and suppliers to perform a large portion of their business operations. The study identified that most of interactions and communications between the businesses and their external partners involved data and information sharing, or on rare occasions, knowledge sharing with trusted external individuals/organisations.

5.3.1.4. Literature

Previous studies (such as Rahman 2015; Robson & Bennett 2000; Jennings & Beaver 1997; Brush, Greene & Hart 2001) have identified that due to their smaller size and scarcity of resources, small business depend on their own generated resources for business establishment, expansion and attaining market share. External businesses such as banks and private investors tend not to invest heavily in smaller businesses as they are seen as risky because of their lack of liquid assets and finances (Lee, Lee, & Pennings 2001). The study results were consistent with this, as participating SMEs were also required to use their own initiative to make effective use of their limited available resources. This is by incorporating KP strategies into their daily business operations implicitly, which does not require any explicit or time-consuming investment.

Past studies (such as Styles & Ambler 2000) have identified that the smaller size of the business and limited human resources helps the business in establishing trust among employees by having a close-knit environment where employees share ideas or knowledge.

This helps in developing social learning within businesses. Social learning is an experimental, interpersonal process of knowledge acquisition that occurs through shared interactions. Trust is one of the major factors that encourages an open exchange of ideas and information, allowing people to learn from each other's experience in a collaborative way. The utilisation of resources to interact effectively (internally and externally) enable SMEs to take the required advantage from the adopted protection strategies (Styles & Ambler 2000). This study has also identified that micro businesses rely heavily on their internal resources, especially human resources, to implement protection methods effectively. Most of the adopted protection methods are informal and semi-formal, such as password protection, authorisation, division of work and so forth, that are utilised by the employees while sharing knowledge and information with each other to accomplish the business processes. This aligns with Birk's (2006) observation that informal methods are more attractive to smaller firms because they are easy to implement and are less time consuming.

It can be said that the smaller size of the business mostly acts as a barrier in the adoption of formal protection methods and thus is also an enabling factor towards the adoption of informal and semi-formal protection methods. Micro sized businesses lack human and financial resources so they tend to use their initiative to make effective use of their available human resources and their social learning capacity to promote their capability of knowledge sharing and consolidating knowledge at the team and the firm level (Garvin 1993). These unique resources are further used to develop internal competencies that enables them to introduce informal and semi-formal KP strategies without going through formal approval procedures. This is also one of the main reasons in the case study businesses for their inclination towards the adoption of less formal protection methods.

5.3.1.5. RBV

The smaller size and limited resources of SMEs in the study means that they tend to rely heavily on knowledge sharing with external business partners, contractors and suppliers. As identified in the literature (Rahman 2015) the availability of internal resources has a direct impact on a business' external capabilities to build relationships with external businesses. So, due to the scarcity of resources the nature of external relationships and the communication exchanges between businesses are highly focussed on data and information exchange. One of the main reasons that SMEs in this study did not widely share organisational knowledge is due to their lack of the resources to protect against knowledge leakage.

The scarce availability of resources makes it difficult for businesses to develop internal competencies that support formal KP strategies. Developing competencies such as formally

registering a patent requires time, expertise, and money, which many SMEs lack. Internal resources developed due to their smaller size and scarcity of resources such as strong intra-organisational employee relationships, become particularly valuable when employees know how to use them to positively impact business performance. Over time, close-knit groups of employees, like those in the micro businesses in this study, develop strong working relationships, a deep understanding of each other's strengths, and effective communication styles. These internal competencies then support the development of external capabilities, such as secure knowledge sharing and collaboration with outside parties. SMEs often rely on external collaborators, such as electrical engineers or plumbing contractors, and sometimes must share sensitive project information, including financial details. In these cases, businesses draw on their strong internal coordination to carefully manage external knowledge sharing. Typically, the project manager consults the internal team to decide what information subcontractors need, ensuring that external party's access only what is necessary without exposing sensitive organisational knowledge.

Table 14 Business Size and Complexity and Its Influence on Knowledge Protection (KP) Strategies

Dimension	Micro Businesses (≤5 employees)	Small / Medium Businesses (≥6 employees)
Resource availability	Severe scarcity of financial, technical, and human resources	Moderate scarcity; slightly greater access to finance and skills
Organisational complexity	Low complexity; overlapping roles and informal task allocation	Higher complexity; clearer role differentiation and task separation
Dominant KP approaches	Informal methods (trust, loyalty, close supervision)	Semi-formal and informal methods (restricted access, role-based sharing)
Use of formal KP methods	Rare to non-existent due to cost and expertise barriers	Limited and selective (e.g., design rights in specific cases)
Human capital role	Strong reliance on close-knit employee relationships as a protective mechanism	Use of trust supplemented by structural controls

External knowledge sharing	High reliance on contractors and suppliers; selective information disclosure	More structured external sharing with defined boundaries
RBV interpretation	Social capital and trust act as valuable, inimitable internal resources	Combination of human capital and organisational routines creates protection capability

5.3.2. Owner/ manager characteristics

One of the observations from the results is that the term ‘owner/ manager’ generally refers to the person managing the business. This person tends to be the owner of the business as well, mostly in the cases of micro businesses. However, sometimes in this study the director of the business was responsible for the daily operational business processes of the business.

Owner/ manager characteristics was identified in the literature review as another factor that can impact the adoption and use of KP strategies in SMEs. The main characteristics of owner/managers that influence KP adoption in this study are their personal attributes such as their business spirit and attitude, educational qualifications, either in IT or business areas, prior similar industry sector work experiences and/or previous work experience.

SMEs in the study were more inclined towards the adoption of informal and semi-formal protection methods to protect against knowledge spill overs. Most of these adopted protection methods depended on the use of information technology/systems such as authentication, authorisation, restricted digital access etc. The cases where owner/managers had qualifications, or previous work experience, in IT often meant they had the ability to implement the required protection methods successfully. Methods such as authorisation, authorisation/restricted access (editable access, viewer only access or only provide comments etc.) could be implemented by the owner/manager him/herself without requiring to share this knowledge with other employees or external partners.

In this study, owner/managers used their past experience, knowledge and skills as an internal competence to plan and make decisions about the use and allocation of organisational resources to build upon the KP capabilities of the business. In addition, if the owner/manager had worked in a similar industry sector as their current business sector they tended to adopt similar protection methods that had been adopted by the business where they worked earlier. This could be because they had witnessed the success of the adopted protection methods.

Furthermore, with their business planning abilities they were able to plan when and where to adopt different KP strategies.

5.3.2.1. Literature

Bracker et al (1986) identified that planning is one of the good management skills that enable businesses to perform better financially and also lay the groundwork for the development of the strategic capability needed for the high performance of a business (Lerner and Almor (2002). The underlying study supported this by also identifying similar findings. Owner/managers' planning skills enable them to identify the required level of protection strategies needed and to develop strategies to implement them when needed. The owner/manager's prior work experience often improves their strategic planning and decision-making skills. According to Waldman & McDaniel (1990), the increase in the number of prior years of work experience increases the skills for preparation of strategic planning. Owner/managers with strategic planning abilities from previous experience are mostly able to make better decisions for the organisation. Based on the findings, owner/managers with prior work experience in similar industry sectors possessed better strategic planning skills. This enabled them to utilise their prior experience in identifying and implementing protection strategies based on their success rate.

5.3.2.2. RBV

In the case study businesses, specific competencies such as educational qualifications, technical knowledge, and skills related to business-specific tasks enabled the owner/managers to identify and implement suitable KP strategies. These internal competencies were critical in equipping the owner/managers to recognize the importance of protecting knowledge and to apply relevant methods within their organizational context.

On the other hand, general competencies including management skills, public speaking abilities, decision-making capacity, and the effective use of power supported the development of external capabilities. In the case study businesses, owner/managers leveraged these competencies to manage relationships with external stakeholders and to make strategic decisions regarding what knowledge to share and how to protect it.

By combining these general and specific competencies, owner/managers were not only able to identify the different type of ICT and other assets that are internally available in the organisation but could also combine different types of ICT assets to create unique KP strategies. These include password protected spreadsheets or word processing documents that require digital signatures before providing editing access. Possessing practical knowledge and skills along with the ability to foresee what methods can provide what type of

protection against knowledge spill overs, means that owner/managers are able to use their internal competencies to extend organisations' ability to protect against knowledge being leaked to their competitors.

Some of the other competencies such as use of power, decision making and management skills are converted into external capabilities used to share knowledge and protect knowledge from knowledge leakage. Business owner/managers were mostly responsible for making the final decisions about the approaches that they wanted the business to implement. Hence, while working with external partners, suppliers or contractors it was mostly the business owner who decided what type of information or knowledge would be shared and how. The adoption of protection methods varies with the type of information or knowledge that is shared.

Ultimately, the owner/managers in the case study businesses demonstrated strong entrepreneurial capabilities by assessing resource availability and strategically capitalizing on external opportunities while ensuring knowledge was shared safely and appropriately. Through these practices, they effectively tailored their KP strategies to suit the specific needs and risks faced by their businesses.

Table 15 Owner/manager Characteristics and Their Impact on KP Adoption

Dimension	Influence on KP Strategies
Education and qualifications	IT- and systems-related qualifications enable direct implementation of semi-formal KP methods
Prior industry experience	Encourages replication of previously successful protection practices
Strategic planning capability	Enables selective and context-specific adoption of KP strategies
Risk perception	Shapes preference for informal/semi-formal over formal protection methods
Decision-making authority	Centralised authority allows rapid KP adoption without formal approval

Use of internal competencies	Combines technical knowledge and managerial skills to design layered KP approaches
RBV interpretation	Owner/manager knowledge and experience constitute core strategic resources enabling KP capability

5.3.2.3. Summary

Based on the analysis it can be said that owner/manager characteristics have a direct impact on the adoption of KP strategies. Their skills, knowledge and qualifications, along with their past experience, enables them to decide and adopt the protection strategy required for the business based on their needs.

5.3.3. SME flexibility

The flexibility offered by the size and the organisational structure of SMEs was another factor that potentially impacted KP adoption by SMEs. Smaller firms typically operate with flat and flexible organisational structures, which facilitate faster decision-making, enhanced adaptability, and innovation (Child 1972; Volberda 1996). Such flexibility allowed businesses in this study to quickly implement KP strategies that were tailored to their specific needs. This responsiveness helped SMEs to secure their intellectual assets more effectively against competitive threats. Moreover, flexible organisational structures have been recognised as a key source of competitive advantage, enabling firms to swiftly respond to market changes, customer demands, and technological advancements (Burns & Stalker 1961; Teece, Peteraf & Leih 2016).

The results showed that micro businesses in the study mostly adopted flexible, flat organisational structures due to limited human resources. In businesses with fewer than five employees, it was mostly impractical to establish dedicated functional areas or maintain a clear separation of duties. Instead, employees typically managed multiple roles and responsibilities simultaneously. In contrast, other SMEs with larger workforces had more clearly defined organisational structures. These businesses had more employees assigned to specific functions and had established distinct departments, allowing for greater specialisation and clearer role differentiation. The study also identified that franchise businesses (who are mostly strictly controlled by their franchisor firms) are required to follow more rigid organisational structures, such as hierarchical organisation structures with clear lines of authority and reporting lines within the businesses.

Participating SMEs with flexible organisational structures did not rigidly allocate roles and responsibilities to their employees. Instead, they managed human resources carefully, assigning multiple roles based on individual employees' skills and knowledge. These roles and responsibilities were often reallocated after the completion of specific projects, reflecting the dynamic nature of their operations. The findings also highlighted those informal structures, which allowed for the circulation of tasks among staff members, helped to build strong interpersonal relationships, fostered employee commitment, and cultivated loyalty informal methods that contributed to protecting the firm's knowledge assets. Furthermore, it was identified that flexible structures allowed SMEs to dynamically allocate financial resources to different business processes according to immediate needs, including investments in KP strategies. Some other advantages identified by the SMEs included faster decision-making, as fewer hierarchical barriers existed, and better lines of communication, as employees across different roles interacted openly and frequently.

In the study, franchise businesses or businesses that were part of a larger group of business with strict organisation structures and reporting procedures were required to follow certain guidelines. They generally received operating manuals, training, brand standards, quality control procedures and business strategies from the franchisor. Interviewees from these businesses indicated that they were legally bound to operate under the franchisor. The enforced strategies are mainly applied to core business processes, which still allows the franchising businesses to usually have a say on the adoption of KP strategies.

5.3.3.1. Literature

Organisational structure can have a direct impact on the implementation of organisational strategies, which can boost organisational performance and reduce costs. Some of the factors that can impact the implementation of strategies are lack of instructions, power and influence and so forth (Waribugo & Ekom Etim 2016). Flexible organisational structures can support the efficient use of human and financial resources and improve the strategic analysis capability of the firm (Terziovski 2010). Owner/managers and other employees can thus contribute towards firms' competitive advantage and business performance (Morgan et al. 2004). Similarly, financial resources such as cash inflows, profits and revenues also help in attaining competitive advantage and scale business performance (Thuy 2023). Organisations with flexible structures have flexible innovation cultures due to relatively low resistance to change, low risk aversion and tolerance of ambiguity (Matejun 2014). The findings of this study resonate with the literature. Those businesses in the study with flexible organisational structures enabled owner/managers to quickly make decisions regarding KP implementation, and these decisions were accepted by their employees with little to no resistance. This was mostly due to the owner/ managers' power and influence on the business but also because

of the flexible and trustworthy relationships among employees. The trust and understanding occurred mainly due to the lack of a strict chain of command and reporting in SMEs.

Small or medium sized franchise businesses usually have to follow the guidelines provided by their franchising company. These guidelines can vary depending on the type of franchise, such as business format franchise, product distribution franchise, single operator franchise and investment franchise. In a business format franchise, the franchisee is obligated to follow specific business plans, processes and models. In product distribution franchises, the franchisor only provides the trademark and product. Single operator franchises allow small operators to work under an established trademark. In an investment franchise, the franchisee only takes up the advisory role and the franchisor actually runs the business (Rahatullah & Raeside 2008). Hence, the business format franchise, product distribution franchise and single operator franchise can provide a lot of freedom to the franchisee businesses. This enables franchisees to develop their own strategic planning and make decisions regarding the storage and protection of their organisational knowledge. The businesses in this study fell into three categories (business format franchise, product distribution franchise and single operator franchise). Even though they were responsible for maintaining the brand image of their franchisor, they still had the freedom to develop their own KP strategies in certain circumstances.

5.3.3.2. RBV

From the perspective of the Resource-Based View, competitive advantage arises not just from owning valuable resources, but from the strategic and often unique ways in which firms deploy these resources through capabilities that are difficult to imitate. In this study, organisational flexibility emerged as a critical capability that allowed SMEs to dynamically align their resources, particularly human capital and financial resources with rapidly changing strategic needs, including the adoption of KP strategies.

Flexibility, in RBV terms, is more than a structural attribute, it is a dynamic capability (Teece 2007; Eisenhardt & Martin 2000). It enables firms to continuously assess and reconfigure their resource base to respond effectively to environmental shifts. In SMEs, this capability was often facilitated by flat organisational structures and informal work practices, which allowed for rapid decision-making, role fluidity, and agile resource allocation. Unlike larger firms constrained by rigid hierarchies, SMEs with flexible structures could quickly mobilise internal knowledge, adapt roles based on employee competencies, and redirect financial resources to areas where they could generate the most strategic value.

The findings demonstrated that micro businesses (typically with fewer than five employees) operated without clear departmental boundaries, relying instead on multi-skilled employees

who assumed overlapping responsibilities. This informality was not a weakness but a strategic strength, fostering a high level of internal trust, employee commitment, and shared ownership of strategic objectives including KP implementation. These firms exemplified how flexibility can serve as a valuable organisational capability by enabling continuous internal resource alignment with external demands, consistent with the RBV focus on resource composition.

By contrast, larger SMEs in the study exhibited more formal structures with defined roles yet still maintained a degree of internal flexibility. Many of these businesses adapted their resource configurations through cross-functional collaboration and project-based reallocations of responsibilities. This semi-structured flexibility allowed them to combine the benefits of specialisation with the agility required for timely strategic response.

Franchise SMEs presented a contrasting picture. While often constrained by franchisor-imposed structures and standardised business processes, businesses within the business format, product distribution, and single operator franchise models retained some independence in strategic decision-making, particularly around (perceived) non-core areas like KP. These firms navigated the tension between structural rigidity and strategic self-sufficiency by leveraging their remaining decision-making space to implement KP strategies tailored to their operational realities.

The study also found that flexible organisational structures contributed to improved strategic analysis capability, a key component of dynamic capability. SMEs with flatter structures and open communication channels were better able to assess both their internal resource capacity and external threats, enabling more timely and informed strategic decisions. This aligns with RBV principles, where firms gain advantage not merely by possessing resources, but by cultivating capabilities that allow those resources to be used in contextually appropriate and valuable ways (Peteraf 1993; Grant 1991).

Ultimately, the flexible structures of participating SMEs enabled rapid role adjustments, efficient allocation of financial and human capital, and responsiveness to external pressures, all of which strengthened their ability to develop and implement effective KP strategies. These findings reinforce the RBV assertion that sustained competitive advantage in SMEs stems not from the quantity of resources, but from the distinctive ways they are deployed through adaptable and strategically embedded capabilities.

Table 16 Organisational Flexibility (Structure and Model) and its impact on KP Adoption

Dimension	Flexible / Flat Structures	Rigid / Franchise Structures
Decision-making speed	Fast and adaptive	Slower due to formal guidelines
Role allocation	Fluid, skill-based, project-oriented	Clearly defined, function-based
KP implementation style	Informal and semi-formal methods embedded in daily routines	KP partly constrained by franchisor policies
Employee involvement	High trust and autonomy	Controlled and compliance-driven
Resource reconfiguration	Dynamic reallocation of human and financial resources	Limited flexibility outside core processes
KP effectiveness	Relies on trust, communication, and informal controls	Relies on contractual and procedural safeguards
RBV interpretation	Flexibility operates as a dynamic capability enabling resource reconfiguration	Partial dynamic capability constrained by external governance

5.3.3.3. Summary

A flexible organisational structure helps SMEs adapt to changing market trends. Due to limited resources, SMEs often rely on informal or semi-formal protection methods. A flexible structure supports better strategic analysis and improved efficiency, which helps businesses make flexible decisions about adopting and using KP strategies based on the quantity and quality of available resources. This flexibility is an important internal capability that allows SMEs to achieve external competence by adopting KP strategies in a way that suits their specific needs, rather than applying them rigidly.

Research suggests that the size and nature of the business, such as whether it is a franchise, affects the organisational structure. Franchise businesses usually follow set guidelines and processes, which can limit their flexibility. On the other hand, non-franchise micro businesses tend to have simpler structures, giving them more freedom to make and act on decisions quickly without needing formal approvals. This means that flexibility has a stronger impact on KP adoption for micro businesses compared to other SMEs with more formal structures. In summary, a flexible structure not only supports quick and adaptable decision-making but also leads to other important capabilities like improved efficiency and strategic thinking, which are key for successfully adopting KP strategies.

5.3.3.4. SME relationships

Another SME factor that influences the adoption of KP strategies is the nature of relationships, both within (intra-organisational) and between (inter-organisational) organisations. This discussion is included under the 'relationships' factor because it focuses on how these connections affect knowledge sharing and protection. While this issue could also be discussed under the 'industry sector' factor since the type and amount of knowledge shared often depends on the business sector it is included here because the relationships themselves play a direct role in shaping KP strategies. It is important to note that these factors are linked, and some overlap is unavoidable, but for clarity, the focus here is on the influence of such relationships.

Many of the SMEs in the study depended on external businesses such as suppliers, manufacturers, partners, or third-party organisations to help them carry out their business activities. These inter-organisational relationships often involved knowledge sharing, which required protection strategies to prevent knowledge spillovers. The construction and real estate businesses, for example, relied extensively on external collaborators such as plumbers, electricians, painters, floor installers, and so forth. Professional, scientific and technical service providers relied on external businesses such as banks, insurance companies and investment groups. Retail businesses mainly worked with manufacturers and suppliers. Most of these collaborations involved data and information sharing, which was usually public data and did not require strict protection methods. The collaborations that involved knowledge sharing, such as construction designs, professional customised services (like website designs), investment plans and product designs, were sufficiently protected using semi-formal and informal protection methods.

The study found that the shared knowledge only became useful to external partners or competitors if they knew how to exploit it. This was true even in cases where the knowledge had been unintentionally leaked. This suggests that KP strategies are not just about

preventing leaks, but also about understanding how the shared knowledge could be used by others.

In addition to external relationships, intra-organisational relationships were also found to influence KP adoption. Due to their smaller size, employees in these SMEs often worked across functional boundaries, increasing the likelihood of internal knowledge sharing. While this flexibility supports operational efficiency, it can also create vulnerabilities if internal KP mechanisms are not robust. This issue was also discussed earlier under the business size factor, as the small size and limited human resources often mean that employees take on multiple responsibilities that require constant knowledge sharing.

Some of the internal knowledge sharing within the selected SMEs happened in the form of project meetings, on-the-job training, shared work on project proposals, pricing strategies, and shared internal databases. Mostly, the internal knowledge sharing was protected through informal protection mechanisms such as effective sharing of information and cultivating commitment and loyalty. Some selected businesses also used semi-formal methods such as documentation in the form of contracts.

5.3.3.5. Literature

Hemonnet-Goujot, Ivens & Pardo (2022) noted that the organisation's dynamic capabilities reflect the ability to seek new resource combinations to facilitate learning and create unique resources for competitive advantage. Inter organisation knowledge sharing is one way to improve strategic competitiveness (Cheng & Fu 2013). The successful outcome of knowledge sharing depends on the intensity and value of the knowledge shared between businesses. Businesses must understand how to create knowledge and develop innovative new products. Creativity not only depends on organisational assets but also on inter-organisational relationships. Roehrich et al. (2019) noted that power, trust, organisational structures, and contracts are key factors influencing inter-organisational settings.

Raza-Ullah and Eriksson (2017) observed that the frequency of interactions and knowledge sharing between organisations can increase the chance of knowledge being leaked or stolen. SMEs with limited resources and capabilities rely more on inter-organisation relationships and knowledge sharing to utilise partner resources and develop capabilities at the expense of lost knowledge or resource. Also, for smaller firms with limited resources it becomes difficult to assess and realise the risks. They mostly focus on what they will gain from such collaborations (Ullah & Eriksson 2017).

SMEs often rely on informal communication and close cross-functional collaboration to share know-how, which, without proper controls, makes it harder to prevent sensitive knowledge from spreading beyond intended boundaries (Durst & Ferenhof, 2014). While such informal,

trust-based knowledge exchange fuels innovation, it also creates vulnerabilities. For example, employees may inadvertently disclose confidential information during casual discussions or teamwork across departments (Ritala et al., 2015). Also, sometimes when staff leave, they take critical tacit knowledge with them, resulting in knowledge loss or leakage to competitors if they join rival firms (Durst & Wilhelm, 2012; Frishammar et al., 2015). The lack of proper protection mechanisms in place makes SMEs prone to internal knowledge leakages. This is supported by the findings of this study, where multiple selected businesses have faced the issue of employees leaving and taking tacit knowledge with them to external businesses, causing knowledge leakage. SMEs are aware of this but due to factors such as limited resources and business growth they tend to ignore this and not do anything about it.

Generally, the results of this study match previous studies. Many of the case study businesses relied extensively on external partners and collaborators. In some cases, businesses were *required* to share their organisational knowledge. For some businesses, collaborations do not require sharing organisation knowledge but they still receive the benefits of shared knowledge.

In addition to external relationships, intra-organisational relationships were also found to influence KP adoption. Due to their smaller size, employees in these SMEs often worked across functional boundaries, increasing the likelihood of internal knowledge sharing. While this flexibility supports operational efficiency, it can also create vulnerabilities if internal KP mechanisms are not robust. This issue was also discussed earlier under the business size factor, as the small size and limited human resources often mean that employees take on multiple responsibilities that require constant knowledge sharing.

This finding aligns with literature that emphasises the importance of internal social dynamics in facilitating or hindering KP. For example, Dyer and Nobeoka (2000) argued that strong intra-organisational networks such as shared routines, norms, and trust support knowledge sharing while simultaneously reducing the need for costly formal protection mechanisms. Similarly, Cabrera and Cabrera (2005) noted that fostering a collaborative culture within organisations improves knowledge circulation but must be accompanied by mechanisms that mitigate the risk of knowledge misuse or loss, particularly when employee roles overlap significantly.

In the selected SMEs, internal knowledge sharing occurred through project meetings, on-the-job training, joint work on project proposals, pricing strategies, and shared internal databases. These activities were primarily supported by informal protection mechanisms such as fostering loyalty, building trust, and maintaining open communication channels. This aligns with Dyer and Nobeoka's (2000) suggestion that social capital rather than formalised

IP frameworks is often the preferred mode of knowledge governance in smaller or more agile firms. A few of the SMEs also used semi-formal methods, including contractual documentation and internal guidelines, which reflects a hybrid approach to protection, consistent with Cabrera and Cabrera's (2005) recommendation for combining cultural and structural safeguards.

5.3.3.6. RBV

RBV argues that businesses can achieve and sustain competitive advantage by owning and leveraging resources that are valuable, rare, inimitable, and non-substitutable (Barney 1991). These resources can be both tangible, such as equipment or infrastructure, and intangible, such as knowledge, skills, creativity, and internal routines. In the context of this study, RBV provides a useful lens for understanding how SMEs manage and protect knowledge while engaging in both intra- and inter-organisational relationships.

The findings highlight the importance of intra-organisational dynamics in the development and protection of critical resources. Within SMEs, employees often work across multiple roles, a characteristic that supports operational efficiency and promotes cross-functional learning. This flexible deployment of staff enables the integration of internal resources, such as tacit knowledge, creativity, and problem-solving capabilities. These internally developed capabilities align with RBV by contributing to the firm's ability to innovate and respond to complex challenges.

However, this same flexibility introduces challenges in safeguarding valuable knowledge. The study found that SMEs faced risks of internal knowledge leakage, particularly when key employees leave the organisation and carry tacit knowledge to competitors. This underscores a key tension within the RBV framework: while internal resource integration enhances competitive capability, it also increases vulnerability in the absence of formal KP mechanisms. Most SMEs in the study recognised the value of their intangible resources but lacked structured systems such as non-disclosure agreements or knowledge management platforms to protect them. Instead, they relied on informal practices such as trust, loyalty, and interpersonal relationships to mitigate these risks.

In terms of inter-organisational relationships, the study demonstrates that SMEs often leverage external collaborations to supplement their limited tangible resources and enhance internal capabilities. In such cases, SMEs selectively shared core resources like creative design knowledge to facilitate collaboration. This knowledge was often protected through informal or semi-formal mechanisms, such as verbal agreements, trusted relationships, and clearly defined professional boundaries.

This selective sharing supports the RBV perspective by showing that while SMEs engage in knowledge exchange, they do so strategically, aiming to preserve the uniqueness and value of their core intangible resources. Rather than viewing external relationships as resources in themselves, SMEs considered them as channels to exercise internal capabilities such as project management, technical expertise, and creativity. These capabilities enabled SMEs to manage knowledge flows in ways that created competitive advantages for example, through the development of integrated, customised service offerings that were difficult for competitors to replicate.

In other sectors, such as professional services and retail, inter-organisational relationships provided access to market insights, financial expertise, or supplier efficiencies. However, the nature of the knowledge shared varied by context.

Additionally, the SMEs' tendency to use informal and semi-formal KP methods such as building loyalty, trust, and using simple contracts, demonstrates their reliance on social capital as a capability to safeguard valuable knowledge. These mechanisms allowed SMEs to share knowledge selectively with trusted partners while minimising the risk of leaks. The use of informal protection aligns with their limited resources and flexible structures and reflects a practical application of RBV where SMEs protect their core capabilities within their operational constraints.

Overall, the study confirms that SMEs apply RBV principles by recognising and leveraging valuable, rare, and inimitable resources, particularly intangible ones such as knowledge and creativity. Through intra-organisational relationships, they build and integrate internal capabilities, while also navigating the risks of knowledge leakage in flexible staffing environments. Through inter-organisational relationships, they strategically share and protect knowledge to access complementary resources and co-create unique offerings. This dual approach reflects a practical implementation of the RBV, enabling SMEs to innovate, collaborate, and compete effectively within their operational constraints.

Table 17 Organisational Relationships and their impact on KP adoption

Relationship Type	Characteristics	KP Implications
Intra-organisational	Cross-functional roles, close working relationships	Encourages informal KP through trust and loyalty

Internal knowledge sharing	Project meetings, on-the-job training, shared databases	Risk of internal leakage managed via informal controls
Inter-organisational	Contractors, suppliers, partners	Selective disclosure using semi-formal methods
Nature of shared content	Mostly data and information; limited strategic knowledge	Reduced need for formal KP mechanisms
Trust dependency	High in long-term relationships	Acts as substitute for formal protection
RBV interpretation	Social capital functions as a valuable and inimitable resource enabling safe knowledge sharing	

5.3.3.7. Summary

SME factor relationships seem to have a medium to low level impact on their KP adoption strategies. The type of knowledge shared that is transferred can depend on the industry sector (discussed later). The study results suggest that both internal and external relationships play an important role in how SMEs adopt KP strategies. While SMEs understand that knowledge is a valuable resource, they often do not have the resources to use formal protection methods. Instead, they rely on informal and semi-formal approaches such as trust, loyalty, and simple contracts. Internal relationships, where employees work across different roles, support efficiency and sharing but can also increase the risk of knowledge leakage. External relationships with partners like contractors or banks help SMEs gain useful knowledge but may also lead to unintentional sharing of important information. These findings support the Resource-Based View that SMEs use their internal strengths like creativity and expertise to build capabilities that help them manage and protect knowledge. By doing this, they are able to innovate and stay competitive, even with limited resources.

5.4. Organisation and other factors

5.4.1. Sector

The industry sector of the business is one of the major factors identified in this study that was identified to have a direct impact on the adoption of KP strategies by Australian SMEs. Most of the industry sectors selected for this study adopted semi-formal and informal protection strategies. The research focussed on four industry sectors: construction, real estate, scientific and professional services and retail. These sectors broadly fell into three categories. First, those that dealt with developing and designing new products such as buildings (construction); second, those that dealt with buying and selling of manufactured goods (retail) and third, those that dealt with establishing policies and strategies (real estate and professional services). Businesses that dealt with knowledge generation in the form of new building designs, new product designs, and setting up customised strategies or policies (construction, real estate and professional services) took KP seriously and invested in formal and semi-formal protection methods to protect against knowledge leakage as shown in the table 14. For example, construction businesses dealt with the development of new customised building designs for their customers. For the protection of their designs, they followed formal protection methods such as design rights and a mix of semi-formal and informal protection methods such as copyright, division of work, restricted access and so forth. Similarly, businesses in professional services dealt with the development of investment plans, financial planning and setting up business accounts based on client requirements. The real estate industry sector relied heavily on market research to develop their buying and selling strategies which, when gathered, was organisational knowledge that required protection from external spill overs. Lastly, retail was the industry sector that mostly dealt with buying and selling of goods manufactured by external companies, with the least amount of organisational knowledge generated or shared with external businesses and suppliers. Hence, businesses in this sector required the least amount of KP. So, it can be said that knowledge intensive businesses pay more attention towards the protection of organisational knowledge.

5.4.1.1. Literature

Scarso, Bolisani, and Paiola (2013) observed that SMEs tend to adopt different KP strategies depending on the nature of their knowledge base and the characteristics of their industry sector. SMEs operating in high-tech industries are typically more familiar with and inclined to use formal protection mechanisms, such as patents and trademarks. In contrast, professional knowledge-intensive businesses often rely on semi-formal and informal methods. This is

because the knowledge they produce, such as market intelligence or financial strategies, is more difficult to safeguard through formal means.

In this study, the selected industry sectors were predominantly neither high-tech nor heavily knowledge-intensive, with the exception of a few businesses within the professional, scientific, and technical services sectors. Among these, some businesses in both the construction and professional services industries used formal protection methods, including design rights and patents, particularly when they developed new products or designs, such as building plans or financial investment strategies.

Meanwhile, businesses that did not engage significantly in product or design innovation tended to rely on semi-formal and informal protection strategies. Many of these businesses worked with products or services that are co-produced with customers, making them more vulnerable to imitation and harder to protect through formal legal mechanisms. These findings are consistent with prior research, reinforcing the notion that the nature of knowledge and industry context significantly shapes the choice of KP strategies among SMEs (Hannah, Parent & Pitt 2011; Scarso, Bolisani, & Paiola 2013).

The reuse of existing knowledge for delivering services to new clients implies that the selected businesses in some of the industry sectors mostly provide a standard bundle of services to their clients, which become easier to imitate. The nature of the service provided by the business is an indicator of the organisational knowledge possessed by the firm (Miles et al. 1995; Tether & Hipp 2002). Firms offering customised services (professional services businesses) possess a rich knowledge base compared to businesses selling standard products (retail). For businesses offering relatively standardised bundles of services to their clients, their reliance on codified and reusable knowledge can make it easier to replicate by competitors as compared to businesses offering customised services. Such businesses in the study used a mix of semi-formal and informal protection methods to protect against possible knowledge leakages depending on the type of knowledge they generate and share with their customers.

Moreover, when examining the adoption of KP strategies by SMEs to address knowledge leakage risks, existing research is quite limited and predominantly focused on either high tech or knowledge intensive firms. A few studies, such as Temel and Durst (2020), have highlighted that the effective implementation of protection methods requires a conscious effort by businesses to assess their knowledge-related risks. However, SMEs often lack the necessary risk management skills to do this effectively. The findings of this study mirror these observations, particularly for micro businesses. In the construction sector, many SMEs operated project-based models with a heavy reliance on subcontractors and client

collaboration. This structure makes it difficult to manage knowledge flows systematically, as knowledge is frequently shared informally across temporary project teams without formal documentation or control. Similarly, in the professional, scientific, and technical services sector, businesses such as consultancy and software development firms often co-create outputs with clients, resulting in fragmented ownership and protection of intellectual assets. Businesses in these sectors typically focus on delivering technical outcomes rather than managing or safeguarding against knowledge leakage as the finished product is ultimately owned by their clients.

5.4.1.2. RBV

The resource-based view approach focuses on a company's resources and capabilities that are unique to its industry and that help to create competitive value. An organisation is seen as a collection of resources that can be used to gain a competitive advantage or improve its overall performance (Soto-Acosta & Merono-Cerdan 2008). Depending on the industry sector, the types of resources that are considered important can vary. For example, in manufacturing industries, tangible resources such as equipment, factories, and supply chains are crucial for gaining advantage (Wernerfelt 1984). In contrast, in industries like technology, consulting, or media, intangible resources such as expertise, innovation, IP, and brand reputation play a bigger role in driving competitiveness (Grant 1996; Teece, Pisano & Shuen 1997). The industry sector of a business defines its core business processes and also plays an important role in identifying the resources required to strengthen its operations (Eisenhardt & Martin 2000). According to RBV, these resources, whether tangible or intangible, are critical for building and maintaining competitive advantage within the industry.

The products and services offered by a business are largely shaped by the sector it operates in, which also influences the type of resources that need protection.

For example, in the construction sector, creative design was identified as a key intangible resource. From an RBV perspective, these designs exhibit value and rarity, especially when they reflect unique architectural or structural ideas that distinguish a firm's service offerings. Firms in this sector attempted to protect this valuable resource using a combination of design rights, copyright, and some informal methods. However, the public availability of designs online for marketing purposes compromised their inimitability. Competitors could legally reproduce these designs with minor alterations (e.g., a 20% change), thereby undermining their potential to sustain competitive advantage. This highlights a sector-specific tension within RBV logic, while the designs are central to creating value and differentiation, the sector's reliance on visual promotion inherently weakens the inimitability of those resources.

In professional services, organisational knowledge and client-specific information were the most strategically significant resources. According to RBV, such resources are not only valuable and rare but often deeply embedded in firm routines and relationships, enhancing their inimitability and non-substitutability. Firms in this sector recognised the importance of safeguarding knowledge to prevent leakage that could damage client trust and erode their competitive edge. Protective measures were often more formalised in this sector due to the high stakes associated with knowledge loss. Here, the RBV implication is clearer: internal knowledge systems, trust-based client relationships, and confidentiality protections collectively serve as barriers to imitation, reinforcing sustained advantage through intangible resource management.

In the real estate sector, internal market intelligence and data-driven insights shaped the basis of competitive strategy. These informational resources although shared primarily within the organisation were central to firm performance. While the sector did not rely heavily on knowledge sharing with external actors, its reliance on internally sourced and analysed data reflects RBV principles. The relative rarity and value of proprietary market insights were acknowledged, but strict protection mechanisms were less common. From an RBV lens, this could reflect a calculated trade-off, the resources were valuable but not perceived as particularly rare or inimitable in a market where data availability is widespread. Consequently, the protection strategies were moderate, aligning with the perceived strategic importance of the resource.

The retail sector generally generated lower levels of organisational knowledge compared to the previously discussed industries, and as such, firms paid less attention to formal KP strategies. From an RBV standpoint, the limited investment in knowledge creation meant that firms in this sector did not often possess resources that were rare, inimitable, or non-substitutable in the RBV sense. However, this generalisation had exceptions. Some retail businesses, particularly those involved in product design, generated and relied on unique intellectual assets such as brand-specific aesthetics, packaging, servicing or consumer experience strategies that did carry strategic value. In these cases, RBV logic becomes applicable, as such resources helped the firm create differentiated offerings that were difficult for competitors to replicate. These businesses were more likely to apply KP strategies such as design registration or trademark protections to safeguard their competitive position.

Each of the four sectors examined illustrated different applications of RBV principles based on the nature of their core resources. Construction firms faced challenges in protecting valuable but easily imitated design work, making inimitability a central issue. Professional services firms built competitive advantage on embedded organisational knowledge and strong client relationships, necessitating stringent protection due to the high value and rarity

of these resources. Real estate businesses leveraged internal market data with moderate protection, reflecting a balance between resource value and availability. They generally lacked strong knowledge assets, but those engaged in product design demonstrated how even within 'low' knowledge industries, RBV can still apply when firms develop distinctive, hard-to-copy offerings.

This differentiated analysis shows that RBV provides a useful lens to understand how industry context shapes not only the types of resources that matter but also the strategies used to protect them. The degree to which a resource is perceived as valuable, rare, and inimitable within a sector directly influences how rigorously it is managed and protected. Competitive advantage is thus not just about owning resources but about recognising their strategic significance within the specific constraints and opportunities of an industry.

Table 18 Industry Sector and its impact on KP adoption

Industry Sector	Nature of Knowledge	Dominant Methods	KP Intensity
Construction	Design knowledge, project plans	Formal (design rights), semi-formal, informal	High
Professional & technical services	Client-specific strategies, financial plans	Semi-formal and formal	High
Real estate	Market intelligence and internal data	Semi-formal and informal	Moderate
Retail	Minimal organisational knowledge	Informal and basic semi-formal	Low
Online presence effect	Public visibility reduces effectiveness of formal KP	Shift towards informal controls	Sector-dependent
RBV interpretation	Knowledge intensity determines perceived resource value and protection effort		

5.4.1.3. Summary

The industry sector significantly shapes the extent to which SMEs adopt KP strategies, influencing both the type and intensity of protection methods used. Sectors that rely on the creation and use of valuable, customised, or knowledge-intensive outputs such as construction, professional services, and real estate demonstrated a stronger inclination towards formal and layers of semi-formal and informal KP strategies to safeguard their intellectual resources. In contrast, sectors like retail, where knowledge creation is minimal and offerings are more standardised, tended to adopt informal and mix of semi-formal protection methods. The sector-specific nature of core business processes, customer relationships/services, and the strategic value of knowledge resources determines not only the perceived risk of knowledge leakage but also the practicality and relevance of KP mechanisms. Thus, the industry sector acts as a critical determinant in how SMEs perceive, prioritise, and implement KP.

5.4.2. Location

The geographic location of the business is another factor that appears to influence the adoption and implementation of protection strategies. The businesses selected in metropolitan Melbourne had access to all the advanced technologies and tools that were required to implement their needed protection strategies. It was evident that most SMEs were inclined towards semi-formal and informal protection strategies such as authentication, authorisation, restricted access, cabinet locking etc. Most of these methods either only required Internet access, or access to tools such as digital locks, video surveillance and physical locks which are available easily in metropolitan regions. The businesses from the regional area provided some contrast to this finding. The availability of tools, technologies, business infrastructure did not vary significantly but the external environment factors varied with respect to the geographic location of the business. It appears that the location has an impact on the adoption of KP strategies. Table 15 provides a quick summary on how location impacts KP adoption across cases.

Differences in the implementation of protection methods across the metropolitan and regional areas were shaped by a range of external factors. These included local market conditions, the maturity of technological infrastructure, and the prevailing levels of trust within business networks. Within this regional context, businesses operating in more stable and trust-based environments tended to adopt less formal or less stringent protection measures. In contrast, where competitive pressures were more pronounced or trust was lower, firms were more inclined to implement stricter and more formalised approaches to KP.

5.4.2.1. Literature

Consideration of information technology is important as it refers to the availability of IT infrastructure, tools and techniques available for the implementation of protection strategies. The availability and implementation of tools can influence KP strategies, and its success such as secure communication mediums or role-based access control helps to increase the KP capabilities of an organisation. According to the Australian Bureau of Statistics (2018), regional areas have limited access to resources such as facilities, technology and tools. Access to digital technologies is less as compared to metropolitan regions. There is often a lack of reliable access to fixed wireless networks and mobile services that hinders businesses from taking full advantage of digital technology. Additionally, limited access to digital literacy programs in regional areas reduces the availability of skilled human expertise needed to effectively implement and manage digital technologies (ABS 2018).

This study contrasts slightly with previous literature, which often suggests that businesses in regional areas suffer from limited access to IT resources (ABS 2018). In this study, most businesses operating in regional areas reported that they did not experience significant shortages in technical resources that would hinder their ability to implement protection strategies.

Instead, the findings indicate that social factors play a stronger role in shaping KP practices in these areas. Specifically, the general perception of higher levels of trust among people in regional communities means that the protection methods such as detailed documentation, cultivation of commitment and loyalty programs, and the use of surveillance technologies are not strictly enforced. Businesses in regional locations tend to share knowledge and information more openly, with relatively low concern about the risk of knowledge spillovers, which diverges from the cautious approach often described in earlier studies focusing on urban or high-competition environments. The findings are also supported by the study performed by Maskell and Malmberg (1999) that identified that in regional economies, firms rely more on localized, trust-based relationships for knowledge exchange. Formal protection mechanisms (e.g., patents) are less emphasized because of stronger social cohesion and lower perceived risks.

5.4.2.2. RBV

RBV theory is grounded in the belief that organisations possess a combination of tangible and intangible resources, such as human, physical, and organisational capital (Barney 1991; Wernerfelt 1984). According to RBV, the differences in performance between organisations within the same industry sector can often be attributed to the availability, distribution, and strategic management of these resources. The theory emphasizes that competitive

advantage and enhanced organisational performance are built not simply through possession of resources, but through the development and deployment of organisation-specific strategic assets (Peteraf 1993). The businesses studied across metropolitan and regional Australia did not see a huge variation in their possession of resources hence they could be interpreted through the lens of how firms leverage and adapt their resource configurations in response to their local environments. Rather than focusing solely on the possession of resources, RBV highlights the strategic importance of how firms develop and deploy context-specific capabilities.

Under RBV, strategic resources are those that possess four key characteristics: they must be valuable, rare, inimitable, and non-substitutable (Barney 1991). Common assets such as cash, laptops, internet devices, and cameras, while essential for operations, are not considered strategic because they are widely available and easily replicated. Strategic advantage comes instead from resources that are more deeply embedded within the firm, such as capabilities, organisational routines, and social relationships that are difficult for competitors to imitate or substitute. Geographic location can play a subtle but important role in shaping access to and use of these strategic resources. While the findings suggest an equal distribution of resources between metropolitan and regional areas, location influences how these resources are leveraged. In particular, regional settings appear to foster a set of unique social dynamics that have strategic implications. The study reveals that in regional communities, there is a general perception of higher interpersonal trust. As a result, businesses in these areas tend to adopt more informal KP practices. Rather than relying on detailed documentation, surveillance technologies, or structured loyalty programmes, regional firms often engage in more open knowledge sharing, with less concern about knowledge spillovers. This behaviour stands in contrast to firms in metropolitan areas, where higher competition typically leads to stricter KP measures.

From an RBV perspective, these social factors in regional communities, particularly trust and communal ties, may themselves constitute strategic resources. They are valuable because they reduce the need for costly formal KP infrastructure. They are rare in the sense that such deep, trust-based networks are not as common in high-turnover, competitive urban environments. These relationships are inimitable due to their path-dependent nature; they evolve over time through shared history and local social structures. Furthermore, they are non-substitutable, as no contractual or technological mechanism can fully replicate the efficiency and goodwill generated by trust. In this light, trust in regional firms can be viewed as a VRIN resource that underpins distinctive organisational capabilities, particularly in knowledge sharing and retention.

The effect of location also extends to the configuration of organisational competencies and capabilities. Businesses in metropolitan areas often require extensive external capabilities, such as formal legal frameworks, IP protections, and surveillance systems, to safeguard knowledge in a competitive environment. Conversely, the relatively low-risk environment in regional settings reduces the need for these external mechanisms. Instead, regional firms rely more heavily on internal capabilities such as long-term staff relationships, mutual commitment, and cultural cohesion to protect and transfer knowledge. These internal capabilities are often informal yet effective, representing a different but equally valid route to sustained competitive advantage.

The findings reveal that location does affect how organisations develop and deploy their capabilities. Regional firms exhibit a distinctive form of competitive advantage that is rooted in social capital and trust-based relationships. These social assets meet the RBV's VRIN criteria and provide a foundation for sustained performance. Therefore, from an RBV perspective, it is clear that location can shape not only resource availability but also the strategic configurations through which firms protect and leverage knowledge.

Table 19 Location and its impact on KP adoption

Factor	Metropolitan SMEs	Regional SMEs
IT infrastructure	Widely available	Comparable access in most cases
Technology constraints	Minimal	Minimal
Market competition	Higher	Variable
Trust levels	Moderate	Generally higher
Dominant KP approach	Semi-formal and informal	Mostly informal unless competition is high
Key driver of KP choice	Competitive pressure	Social dynamics and trust
RBV interpretation	External market pressure shapes capability deployment	Trust acts as a VRIN social resource

5.4.2.3. Summary

Overall, it can be said that the location of a business has a moderate impact on the use and implementation of KP strategies. While existing literature has suggested that capital and regional cities differ in their access to digital tools and technologies, the study findings did not support that claim. Instead, the findings highlight that the differences in market conditions and the social dynamics of the people businesses work with and serve play a more significant role in shaping KP practices. In particular, the higher levels of trust and openness commonly

found in regional areas reduce the reliance on formal protection methods, allowing for more informal and socially embedded approaches to knowledge sharing. This suggests that location influences the type of capabilities and resources businesses develop, with regional firms leveraging trust and strong interpersonal relationships as strategic assets under the RBV framework.

5.4.3. Age

The initial framework developed based on the literature did not identify the factor 'age' but it became evident from early responses in the study that the age of a business can impact its adoption of KP strategies, so the factor was included. Newer (younger) businesses in the study generally leant towards using their resources in the direction of growth and expansion. So, the majority of their financial resources were invested in attaining and retaining customers and expanding their businesses. The small size of the businesses (as previously discussed) combined with the young age of some of the businesses in the study acted as a barrier to the adoption of KP strategies. Young businesses often struggle with limited time and resources, making it especially difficult for them to track knowledge leakages or invest in costly new protection methods. An interesting finding in the study is that business growth appeared to be related to the age of the business. Over time, some of the businesses in the study grew and expanded. With such expansion their situation changed. For instance, they may realize the need to open new offices. Because of this, knowledge sharing across different locations and offices and the generation of new business knowledge during expansion required more layers of KP protection for a number of the case study businesses. Growth and expansion can involve different strategies, such as increased customer base, opening new offices in different locations and expansion in the services and products provided by the business. Each of these had a different impact on KP adoption in the study. With expansion of the customer base, the main business operations were not usually changed over time and existing KP strategies mostly still provided required protection levels. However, expansions in business size with new offices being opened at different geographic locations required some businesses to increase their knowledge sharing across different locations. In addition, the storage of products at different locations required them to expand their existing protection methods. Such expansion involved the application of the same methods (but at different locations) or new, different methods at different locations (depending on the availability and storage of different types of knowledge at different locations). Lastly, expansion occurred in terms of new products and services offered by the business. This type of expansion had a major impact on KP adoption. To offer new services and products, businesses required expansion in infrastructure that involved the implementation of more informal and semi-formal protection methods. If new products were

uniquely designed and produced by the business then they required different types of protection, such as formal protection in the form of patents or design rights.

In some cases, it was only after spending years in operation that businesses properly understood the KP issues they faced, and they realised that they needed to devote more time to the identification and adoption of KP strategies. Table 20 provides a detailed summary on how age and growth influenced KP adoption for businesses in the retail industry sector.

While growth and age are interconnected, they represent distinct factors in KP adoption. It is worth reflecting on how each contributes to a business's ability and need to protect knowledge. Although growth tends to be more visible in shaping protection strategies, age contributes to internal readiness and awareness. This distinction is considered in the broader/updated framework.

5.4.3.1. Literature

According to Radipere & Dhliwayo (2014), new firms find it difficult to enter or gain market share due to restricted access to financial capital as investors do not generally invest in young firms due to lack of credit history. To convince investors, new firms often have to create an impression of viability and legitimacy, which is not an easy task due to lack of proven track record. In their early years, businesses are more inclined towards reducing entry/exit barriers, improving access to finance, building networks, acquiring customers and building and consolidating market share. Over time, businesses start focussing on growth possibilities, expansion and innovation. Furthermore, business owners develop their skills to assess and realise the full potential of their business (Moos & Melodi 2016). Businesses accumulate and acquire more tangible and intangible resources over time. According to Moos & Melodi (2016), businesses that have been long established have more experience and better strategies to survive in the market.

These findings are consistent with the results of this study, where the young businesses in the construction, real estate and retail business faced funding issues and they had to rely on their personal informal networks to arrange the financial resources to be invested in the business. They were more focussed on getting those investments back than on growth and expansion. They also restrained themselves from spending these resources on the adoption of KP strategies. Other businesses in the study who were older demonstrated more robust growth strategies and a stronger market presence. Sometimes knowledge was also shared within the organisation but across geographic locations. A similar finding was presented by Al-Shammari & Alsharari (2023), who identified that organizational expansion can make consistent implementation of KP difficult. As organizations grow, their ability to manage, codify, and protect internal knowledge becomes increasingly fragmented.

5.4.3.2. RBV

The age of the business reflects the time that businesses have spent on performing market research, collecting data, exploring opportunities and learning how to capture the potential value offered by their strategic resources. Mostly business develop these dynamic capabilities over time, with experience.

According to RBV, the age of a business is important because it affects how well a company can use and protect its resources. As businesses get older, they gain experience, build routines, and create clear rules and systems. These help them improve their ability to manage change and protect important knowledge. The results of the study showed that older, more experienced businesses are better at protecting their knowledge. This suggests they have learned how to protect what makes them different from competitors something RBV sees as key to long-term success (Barney 1991).

As a business grows, it also becomes better at organizing and protecting knowledge. Growth brings more people, teams, and projects, which makes it more important to control who sees what information. The study found that growing businesses are more careful about managing access to sensitive knowledge. They do this by separating information, so only the right people or teams can see what they need. This helps the business protect valuable knowledge (built from sensitive information) and reduces the risk of leaks or misuse. By ensuring that knowledge is properly distributed and protected, businesses are also strengthening their internal competences and capabilities by making sure that the right expertise is supported with the right knowledge at the right time.

In short, both the age and growth of a business help it to build stronger KP strategies. Older and larger businesses are better able to manage and protect their important resources. This supports the RBV idea that a company's success depends on how well it develops, uses, and protects its internal strengths over time (Barney 1991).

Table 20 Age and its impact on KP adoption

Dimension	Younger Businesses	Older / Growing Businesses
Resource allocation focus	Survival and growth	Expansion and risk mitigation
Awareness of KP risks	Low	High
KP strategy maturity	Informal and minimal	Layered informal, semi-formal, and selective formal
Impact of growth	Triggers reassessment of KP needs	Expands scope and complexity of KP
Process change influence	Limited	Drives adoption of new KP methods

Dimension	Younger Businesses	Older / Growing Businesses
RBV interpretation	Capabilities underdeveloped	Experience builds dynamic protection capability

5.4.3.3. Summary

The age of a business appears to have a moderate impact on the adoption of KP strategies. Within this, business growth can be viewed as a sub-factor of age, as growth often accompanies the passage of time and accumulated experience. As businesses grow, whether through expansion of infrastructure, facilities, products, or services they are more likely to recognize the need for additional and more advanced protection measures. This growth drives the extension of protection strategies to new physical or functional areas and also broadens the types of methods used. With age and the associated growth and experience, companies tend to develop and apply a wider range of mechanisms such as legal protections, strategic human resource practices, cybersecurity measures, and knowledge classification to safeguard their intellectual assets. Under RBV, these KP strategies help preserve the unique value of a firm's resources, thereby sustaining its competitive advantage. In doing so, they also enhance the firm's internal competences and capabilities by ensuring critical knowledge is retained, efficiently accessed, and appropriately shared within the organization. This enables employees and teams to perform more effectively, innovate securely, and build specialized expertise that aligns with the firm's strategic goals.

5.5. KP strategies

The literature review had categorised KP methods into three categories: formal, semi-formal and informal protection methods. This categorisation is consistent with findings in works such as Zins (2007) and (Paallysaho & kuusisto 2011), which distinguish between codified/formal and tacit/informal protection mechanisms.

Formal KP methods that are generally expensive and time consuming due to the nature of their implementation were mostly ignored by the SMEs in this study. This is consistent with prior findings by Leiponen and Byma (2009), who noted that smaller firms are often resource-constrained and therefore less likely to pursue formal IP protections. The common barriers in their implementation were size, owner/manager characteristics and industry sector of the business. The smaller size of the businesses generally led to scarcity of resources (mainly financial and human) which are often required for the implementation of formal KP methods. Owner/manager characteristics also inhibited the adoption of formal protection methods, as the beliefs and perception of managers are altered. Their educational qualifications,

knowledge acquired from previous work experience and exposure to the similar industry sectors makes them believe that they can achieve the required protection with other forms of protection mechanisms, thus saving costs and time. These are consistent with previous research. For instance, Hanel (2006) and Gans et al. (2008) found that the **size of a business correlates strongly with formal IP usage**, as small firms may lack both financial capital and legal expertise. Similarly, **managerial perception and prior industry exposure**, as discussed by Cohen et al. (2000), can bias decisions toward relying on internal or informal mechanisms over formal KP systems. Lastly, the industry sector acts as a main barrier to the adoption of formal protection methods. The industry sectors selected for this study were construction, real estate, professional services and retail. These sectors use websites, social media and other digital tools to extend their customer reach, promote products and services and increase their market presence. This extended use of these marketing strategies makes implementation of protection mechanisms complex and difficult. The **industry sector's** role as a barrier is also supported by Bolisani, Paiola and Scarso (2013) study emphasising that if the business offerings are service-based or highly commoditised, formal IP is often viewed as less relevant.

Semi-formal and informal protection methods are easier to implement than formal methods. Generally, they do not require any formal application procedure or approval except those semi-formal methods require approval from the board of directors, stakeholders or the owner/manager of the business (depending on the organisational structure). These findings align with findings by Spithoven et al. (2010), who argued that SMEs often prefer flexible protection strategies such as **restricted access, secrecy, or contractual agreements** over rigid legal protections. The common enablers for the implementation of these methods in this study were business size, owner/manager characteristics, flexibility (flexible organisation structures), relationships (inter and intra organisation relationships), industry sector and age of the business. The owner/manager characteristics (especially the education qualification and prior industry experience) played an important role in the inclination towards using semi-formal and informal protection methods. Owner/managers who had qualifications in information technology, information systems or computers systems in general were more familiar with the use and adoption of most of these methods. This enabled them to implement the required methods themselves, which provided another level of protection as they did not need to share the information with external people or businesses. Methods like restricted access, secrecy, technical protection, effective sharing of information using technology were easier to implement. Similarly, sometimes the prior work experience of owner/ managers, where they have worked in a similar industry sector, also inclined them towards these protection mechanisms as they have seen the success of the comparable methods. The

influence of **managerial educational qualifications**, especially in IT and systems knowledge, mirrored findings by Keramati and Azadeh (2007), who noted that digital skills enhance the internal implementation of KP systems without third-party dependence.

The flexibility offered by the adopted organisation structure of the businesses also favoured the adoption of semi-formal and informal protection methods by SMEs in the study. Again, as these methods mostly did not require formal procedures, SMEs could adapt and implement protection strategies based on their needs and requirements. Informal protection strategies such as the division of duties, circulation of staff between tasks and effective sharing of information allowed SMEs in the study to allocate roles and responsibilities to their employees based on projects. When projects finished, new roles and responsibilities were allocated. The information shared with employees and team members also varied based on the designated roles. Earlier studies have not indicated if flexibility also impacts the adoption of KP mechanisms. Grant (1996) emphasised structural agility as a key enabler for tacit knowledge management without referring explicitly to KP adoption.

Inter and intra organisation relationships, along with the industry sector of the case study businesses, acted as an enabler for the implementation of semi-formal and informal protection methods in the study. Most of the SMEs worked with external suppliers, contractors and other businesses to provide their services to their clients. Inter organisation relationships were also influenced by the flexible organisation structure of the businesses. This factor was complex as its influence varied across businesses. Past studies have only identified that the lack of structured knowledge management makes SMEs especially vulnerable to “internal” leakages, unintentional knowledge loss that happens during everyday information sharing, emphasising the importance of balancing open knowledge exchange with protective measures (Durst & Zieba 2017; Durst & Ferenhof 2014). Adopted semi-formal and informal protection methods such as effective sharing of information, cultivating commitment and loyalty, and customer relationship management were impacted by the nature of the knowledge shared among the businesses in the study and their external partners. Businesses having long term relationships with their external partners relied on the trust and loyalty to achieve the acquired protection, whereas professional businesses acquiring audit approvals depend on customer relationships management (CRM) policies. Similarly, the relationships within organisations, especially in micro and small businesses where employees work across functional boundaries, also impacted the adoption of KP strategies. For effective knowledge sharing and to protect against knowledge leakage, various semi-formal and informal protection strategies were adopted by the businesses in the study, such as restricted access, cultivating commitment and loyalty and documentation. When employees work together on projects or are providing training to new staff etc., they

were required to share project related knowledge with their co-workers and the trainees that required protection.

Industry sector also separately acted as an enabler for the adoption of semi-formal and informal protection methods. The selected businesses for this study mostly did not conduct manufacturing, designing or innovative software or application development that required strict protection mechanism against knowledge spillovers. The required KP methods for these businesses were relatively easily achieved by protection methods such as restricted access with cabinet locking and division of duties, database protection with password protected computers. Product designs in the form of pictures, blueprints or 3D models available online were protected by copyright. This is supported by Bolisani, Paiola and Scarso (2013), who highlighted that the rate of usage of KP methods was generally low across sectors such as information and communication technology, design and communication and professional services whereas accounting or other financial services employed KP mechanisms more frequently than others.

The age of the business acted as a factor influencing the adoption of formal protection methods because in the early years mostly businesses struggled with their financial resources as suggested by past studies (Radipere & Dhliwayo 2014). Instead of spending their limited financial resources on formal protection method registration fees they relied on semi-formal and informal protection methods. This occurred in this study. In addition, young businesses lack market exposure which made them naïve in understanding the possible risks of knowledge leakage. Younger businesses are more focussed and invested on their growth and expansion rather than KP methods (Durst, Edvardsson & Foli 2023). Along with the age there is another factor that was identified in study that impacts the KP adoption and that is **growth of a business**. Some businesses that were older but did not expand kept relying on their adopted KP mechanisms without any changes, whereas businesses that were comparatively younger but had expanded their customer base or services saw a change in the adoption and implementation of protection methods. Meanwhile, younger businesses in the study that were growing tended to adjust and expand their protection strategies, suggesting that it is the direction of the business's growth, not just its age, that affects how KP is managed. This idea has not been explored in prior research and could be a new finding.

The location of the business is another factor identified by the literature that impacts KP adoption. Under location, two sub-factors were identified in the study that appeared to have an impact on the adoption of KP strategies: the availability of IT infrastructure, tools and technology; and differences in external market conditions. The availability of resources, including IT infrastructure and access to tools and technology, was relatively similar across

these metropolitan and regional locations. Therefore, the adoption of informal protection methods appeared to be unaffected by resource availability in these regions. However, differences in external market conditions such as the level of market competition, client expectations, product demand, and access to suppliers played a more critical role in shaping KP strategies. This study adds to the field by showing that even with equal IT **access**, regional firms differ in KP strategies due to competitive intensity, again suggesting a new empirical contribution.

The RBV of the firm posits that competitive advantage arises from resources that are valuable, rare, inimitable, and non-substitutable (VRIN) (Barney, 1991). When applied to the three KP approaches identified in this study, we see that each leverages different types of resources and capabilities.

Formal methods depend primarily on financial and legal resources, which many SMEs do not possess. Methods such as patents or trademarks can create strong legal protection that is difficult for others to imitate, aligning closely with the RBV idea of securing unique and inimitable resources. However, because they are costly and often inflexible, they are rarely used in fast-changing industries or by small firms. For example, a construction business in the study found it too expensive or unnecessary to patent a unique building design when layered semi-formal and informal protection methods were sufficient. Similarly, the retail businesses avoided formal protection due to cost or lack of in-house production, instead relying on informal mechanisms such as loyal cabinet locking, division of work and strong customer relationships to maintain their competitive position.

Semi-formal methods, such as contracts, restricted access to documents, or requiring managerial approval to share information, draw on internal systems and relational routines to protect knowledge. These mechanisms are less expensive than formal methods but still provide businesses with structure and control. From an RBV perspective, these methods rely on organisational processes and routines that are often path-dependent and firm-specific, making them difficult for competitors to replicate.

Informal methods such as trusting staff, fostering loyalty, rotating job roles, and embedding knowledge into everyday practice are rooted in social relationships, organisational culture, and tacit knowledge. These are developed over time and are often unique to each firm, making them highly inimitable and thus well aligned with RBV's emphasis on rare and hard-to-substitute resources. For instance, small construction firms may protect project knowledge by sharing sensitive information only with long-term, trusted employees, often complementing this with division of work or rotating responsibilities. However, because these

informal methods are embedded in social and organisational contexts, they may be difficult to enforce consistently and may not work uniformly across firms or situations.

Theoretical contribution to RBV: This thesis extends RBV by demonstrating that **knowledge protection itself can take the form of VRIN resources and capabilities**, but that *different protection approaches generate VRIN characteristics through different mechanisms*. Formal methods generate inimitability through legal enforceability; semi-formal methods generate it through firm-specific routines; and informal methods generate it through socially complex relationships and tacit norms. By showing how SMEs strategically combine and substitute these methods depending on resource constraints and industry conditions, the study highlights those internal capabilities **can emerge not only from knowledge assets but also from the ways in which firms protect those assets**. The findings therefore broaden RBV by illustrating that KP practices function as dynamic, context-dependent capabilities that contribute to sustained competitive advantage particularly in resource-constrained settings where formal mechanisms are less feasible.

5.6. KP Benefits

The results of the study suggest that some businesses believed KP brought benefits like better innovation, a stronger competitive position, more value creation, and in a few cases, help with business process outsourcing. However, not all businesses mentioned these benefits.

There were also some clear differences between businesses of different sizes and industries. Many small and micro businesses did not use formal methods to check if KP was working. Instead, they trusted their instincts, customer feedback, or general improvements in how they worked. Larger businesses in the study were more inclined to at least conduct informal reviews, but still, none of them used official tools or metrics to measure success.

5.6.1. Literature

These results match what other studies (Amalia & Nugroho 2011; Desouza 2010; Greiner, Bohmann & Krcmar 2007; Lee & Lan 2011) have found, KP can support innovation and competitive advantage. But other research also suggested that SMEs often lack formal structures, resources, and expertise to plan and evaluate IT strategies effectively, relying more on informal practices and managerial intuition (Thong, Yap & Raman 1996). This also seems to be true for KP strategies in this study. While innovation and competitive advantage were common benefits, only a few businesses mentioned business process outsourcing, and not always directly. The businesses were asked follow up questions about their IT support

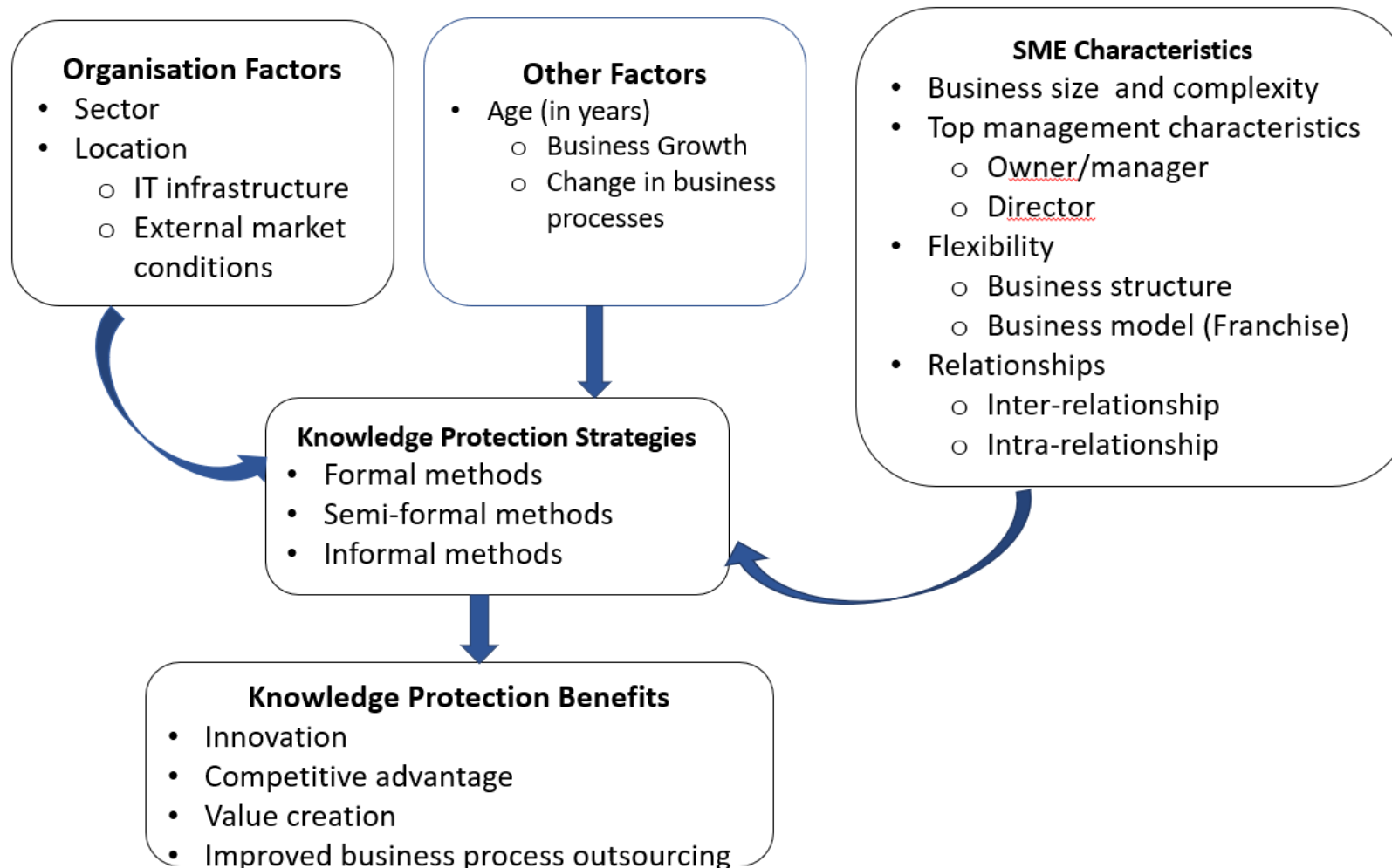
when they confirmed that most of them have been outsourcing this to save money and focus on their core activities.

5.6.2. Resource-Based View (RBV)

KP helps businesses build and protect useful resources like skills, knowledge, or internal processes that are valuable and hard to copy. These resources can help businesses stay ahead of competitors. But if businesses do not measure the results of their KP strategies, they cannot be sure these strategies are really working. Most SMEs in this study seemed to rely on guesswork or instinct rather than clear evidence when considering the success of KP strategies. This suggests that SMEs should try to find simple ways to check if their KP strategies are actually helping them. Without this, it is hard to know if the resources and skills they develop are being used well.

5.7. Final Theoretical Framework

In light of the gathered data and a deeper analysis of the research problem, the theoretical framework for this study has been revised to better align with the study's findings. This updated framework as presented in Figure 7 integrates the original categories, offering a more refined lens through which to examine the factors that enable and inhibit the use and implementation of KP strategies. The refinement addresses previous limitations, mainly the under researched area of KP in the context of Australian SMEs and enhances the explanatory power of the framework, ensuring a more robust foundation for the subsequent analysis.



Based on the literature review the factors impacting the adoption of KP strategies were categorised into two main factors, SME characteristics and Organisations and other factors. Under SME characteristics there were four main factors: business size, owner/manager characteristics, Flexibility and relationships. Organisations and other factors comprised: industry sector and location (with the age of the business added early in the study). Business size is a fundamental SME characteristic because it determines the resource base, operational capacity, and structural simplicity typical of SMEs. Owner/manager characteristics are an SME characteristic because SME behaviour is uniquely and heavily shaped by the personal attributes of the owner. Flexibility is also considered an SME characteristic because it arises from the typical structural and operational nature of SMEs. Similarly, relationships are an SME characteristic because SME success often depends on relational networks rather than formal organisational systems. On the other hand, industry sector is an organisational factor because it is an external structural attribute of the firm's operating context, not an intrinsic SME trait. Location is an organisational factor as well because it defines the environmental context the organisation operates in, not a feature of the SME's internal nature. Also, age is categorised as an organisational factor because it describes the internal structural maturity and lifecycle stage of the firm, not a fundamental characteristic of SMEs or their managers. For further refinement and based on the findings of this study some of these factors are either renamed or are further sub categorised. The details about the changes are discussed below.

Within SME characteristics, the first factor **business size** is renamed to **business size and complexity** to better reflect the dynamics observed within SMEs. Business size is mostly defined by the number of employees but the complexity of the business is defined by "what the business does". Smaller firms providing various services could be considered complex as their area of expertise expand. While smaller firms often benefit from close-knit structures that make KP more manageable, this alone does not capture the full picture. The nature of the business activities, particularly in firms that primarily buy and sell existing properties or buy or sell products manufactured by other businesses suggests that there is often minimal knowledge generated that actually requires safeguarding. This highlights that simplicity in business operations can also reduce the need for complex knowledge management strategies. Therefore, introducing **complexity** alongside **size** in the framework allows for a more accurate categorization of firms, acknowledging that smaller, simpler businesses may face very different knowledge-related challenges compared to those with more intricate operations.

Owner/manager characteristics is renamed to Top management characteristics with two sub-categories: i) **owner/manager characteristics** and ii) **director characteristics**. This

change has been made due to the factor that it is not always the **owner/manager characteristics** that influence the adoption of KP strategies. For some businesses, it the characteristics of the other people who are mainly responsible for taking the daily operational decisions about the business, such as the director of the business. This is especially in the case of small to medium sized business where the **director of the business** is responsible for the actions and decisions of the managers. Some real estate businesses have an owner/manager and director of the business where power resides with the director of the business, who is primarily responsible for providing the strategic guidance and overseeing the company's long-term direction.

Flexibility is also refined, with added sub-categories: i) **business structure** and ii) **business model**. This refinement was made to better reflect the various ways flexibility influences the adoption of KP strategies. **Business structure** refers to how a company is internally organized, including its hierarchy, decision-making processes, and the degree of centralization. A more decentralized structure often allows for quicker and more adaptable decision-making, which can support the use of informal or semi-formal KP strategies.

Business model, in contrast, refers to how a business creates, delivers, and captures value. Different models require different approaches to protecting knowledge. For instance, businesses operating under a franchise model typically need to adopt KP strategies based on their franchise contract. This is because valuable proprietary knowledge is shared with franchisees, making it necessary to use legal agreements such as non-disclosure contracts or IP clauses within franchise agreements.

Relationships is also categorised into: i) **Inter-relationships**, and ii) **Intra-relationships**. This refinement has been made to better capture the different types of relational dynamics that may influence the adoption of KP strategies. **Inter-relationships** refer to the connections and interactions that exist between the business and external stakeholders, such as customers, suppliers, partners, or industry associations. These external relationships often involve knowledge exchange and collaboration, which can expose businesses to risks of knowledge leakage. Therefore, SMEs with strong external ties may be more likely to adopt formal or semi-formal KP strategies to protect sensitive information.

Intra-relationships, by contrast, concern the interactions and communication that occur within the business, particularly among employees, teams, and departments. These internal relationships can play a significant role in shaping a company's knowledge-sharing culture and its approach to protection. Strong intra-organizational relationships may encourage informal KP strategies through trust and shared understanding, especially in smaller SMEs where communication is more direct and personal.

Under Organisation and other factors, the Age (**in years**) has been identified as another factor which is further divided into two sub-categories: i) **Business growth**, and ii) **Change in business processes**. This change recognises that the age of a business alone may not fully explain its KP behaviour. **Business age** refers to the number of years a firm has been in operation. Older businesses may have more structured KP strategies due to their accumulated experience and greater awareness of potential risks. In contrast, younger firms may rely more on informal methods due to limited resources or lack of exposure to KP issues. **Business growth**, however, provides a complementary perspective. A business that has experienced rapid growth, regardless of age, may be more likely to adopt formal or semi-formal KP methods to safeguard its expanding assets, partnerships, and knowledge base.

Change in business processes introduces another important dimension to understanding a firm's KP behaviour. As businesses evolve, they often undergo transformations in how they operate, whether through adopting new technologies, restructuring internal workflows, entering new markets, or redefining their service delivery models. These process changes can trigger a reassessment of KP needs. Similarly, businesses implementing collaborative or decentralised workflows may require new mechanisms to manage and protect shared knowledge. In essence, significant changes in business processes, regardless of the firm's age, can prompt shifts in how knowledge is valued, shared, and safeguarded, often leading to the adoption of more deliberate and structured protection measures.

Similarly, the factor **Location** is now sub-categorised into: i) **IT infrastructure**, and ii) **External market conditions**. This refinement accounts for the broader environmental context in which a business operates. **IT infrastructure** refers to the technological capabilities available in the business's geographic region, such as internet connectivity, access to digital tools, and cyber security systems. This might be more relevant in areas with poor infrastructure such as developing countries or remote areas. This is supported by Oyeyemi and Bwalya (2020) study that directly connects ICT infrastructure with knowledge management practices in developing contexts, emphasizing how limitations in infrastructure restrict the adoption of formal digital KP tools. These factors directly influence the feasibility and type of KP strategies that can be implemented. Businesses located in regions with advanced IT infrastructure are more likely to adopt digital and formal KP tools. This study found some contrasting results though, the availability of resources required for the adoption of KP strategies in both metropolitan and regional area were almost similar and hence this did not have a significant influence on KP adoption

External market conditions include the level of competition, regulatory environment, and economic stability of the business's operating location. In highly competitive markets, firms may be driven to adopt stronger KP measures to protect their innovations and maintain a

competitive edge. External market condition is placed under organisational factors because it refers to the firm's immediate competitive and market situation which is a part of its operational context and not the general business environment.

Building on earlier research on knowledge management and technology adoption in SMEs, which often focuses on technology, organisation, and environmental factors, this study develops a framework that is more closely linked to the real context of SMEs. Instead of using broad categories, the new framework separates the factors into two main groups: **SME characteristics** (business size and complexity, top management characteristics, flexibility, and relationships) and **organisation and other factors** (industry sector, location, and age). Each group is then broken down into more specific parts that help explain SME behaviour more clearly. Examples include separating owner/manager characteristics from director characteristics, dividing flexibility into business structure and business model, distinguishing relationships inside the business from those outside, and breaking age into business growth and changes in business processes.

These refinements make three main contributions to theory. First, they give a new way of understanding common factors such as size and age by adding ideas like operational complexity, business growth, and changes in business processes. These helps explain more clearly why SMEs adopt different KP strategies. Second, they improve our understanding of SME leadership and relationships by separating the roles of owners/managers and directors, and by showing how internal and external relationships relate to different types of KP methods (formal, semi-formal, and informal). Third, by breaking location into IT infrastructure and external market conditions and showing that differences in infrastructure between metropolitan and regional areas not always strongly influence KP adoption, the framework challenges the idea that ICT limitations are always the main barrier to KM or KP in less-resourced areas but is not the only factor.

5.8. Chapter Conclusion

This chapter analysed the findings of the study, through the theoretical lens of the RBV. The analysis suggested that small business characteristics such as size, owner/manager traits, organisational flexibility, and relationships play a major role in how KP strategies are adopted and implemented. Most SMEs used informal and semi-formal methods for protecting knowledge, mainly because they are easier and cheaper to implement compared to formal methods. Micro businesses faced resource limitations that made it difficult to use formal KP strategies. They relied more on trust, loyalty, and simple tools like password protection or restricted access. In contrast, other SMEs with more resources implemented some semi-

formal strategies such as role-based access or contracts. Owner/managers' characteristics also had a strong influence on the choice of protection strategies, specifically previous industry experience and education (especially in IT).

The flexible structure of SMEs helped them to quickly adapt and implement KP strategies as needed, without waiting for formal approvals. Businesses with good internal relationships and trusted external partners were more comfortable sharing knowledge, though they still took steps to prevent leakage. Industry sector also influenced KP strategies, especially in knowledge-intensive sectors like construction and professional services, where businesses tended to take more precautions to protect unique knowledge.

Although the role of location demonstrated mixed results, it became clear that both metropolitan and regional businesses had access to the basic IT tools they needed for protection. However, trust, competition levels, and customer expectations in each area influenced their KP choices in differing ways. Business age and growth also impacted KP adoption, as older and/or growing businesses tended to identify risks clearly and put in more protection layers accordingly.

Overall, the analysis suggests that KP strategies in SMEs are shaped by a mix of SME and other internal and external organisational factors. These strategies are not formally planned in most cases but grow with experience and need over time. From the RBV perspective, the informal and semi-formal KP methods helped SMEs use their resources in a way that supports competitive advantage, even if they did not always measure KP benefits formally.

Chapter Six: Conclusion

SMEs play a vital role in national economies, contributing significantly to GDP and providing a large proportion of employment opportunities. Their agility and innovation make them key drivers of economic growth and competitiveness across various industries. KP, as a crucial element of knowledge management, involves safeguarding valuable organizational knowledge from loss, misuse, or unauthorized access. It is essential for maintaining a competitive advantage, supporting innovation, and ensuring long-term business success.

This research set out to explore how SMEs in Australia adopt and implement KP strategies, and to develop a framework that explains the enablers and barriers to their use along with exploring the benefits offered by the KP adoption. The study was motivated by a critical gap in the literature, that while SMEs are increasingly recognized as knowledge-intensive and vital to national economies, there is limited understanding of how they manage and protect knowledge, especially in the context of limited resources and capabilities. This study is important because it addresses a significant gap in the understanding of how SMEs approach KP, an area often overshadowed by larger firms with more established strategies. By exploring the extent to which SMEs implement KP mechanisms, the study highlights the need for greater awareness and strategic planning in protecting intellectual assets, which are critical for maintaining a competitive edge and fostering innovation. As SMEs are key drivers of economic growth and innovation, ensuring their knowledge is adequately protected is essential for long-term sustainability.

Using a qualitative case study approach, the research involved 20 SMEs from four diverse industry sectors: construction, real estate, professional services, and retail. The study adopted an interpretivist paradigm and was guided by RBV theory, which emphasizes that competitive advantage stems from the unique, valuable, and hard-to-imitate resources possessed by firms, with knowledge being a key intangible asset. Data was collected through semi-structured interviews, allowing for in-depth exploration of participants' experiences and insights. The results were analysed through the lens of RBV theory to examine how SMEs utilize their internal resources efficiently to develop capabilities necessary for the implementation of KP strategies.

The study revealed that KP is an essential but often under-prioritized aspect of strategic management in SMEs. Most SMEs in this study used a combination of informal and semi-formal KP strategies, such as password protection, restricted access, documentation, division of labour, and trusted relationships. Only a few SMEs used formal methods like patents, trademarks or design rights, largely due to their cost, complexity, and relevance to the firm's core operations.

The research confirmed earlier studies that suggested the size of the business, owner/manager characteristics, organisational flexibility, inter- and intra-firm relationships, and industry sector all significantly influence KP adoption. Furthermore, age and growth of the business, geographic location, IT infrastructure, and external market conditions emerged as important contextual factors that influence KP adoption. SMEs also often relied on tacit methods of protection (such as loyalty and trust) and were more reactive than proactive in identifying and managing knowledge risks.

6.1. Theoretical contributions

This study makes three principal theoretical contributions. First, it refines and extends existing frameworks for understanding KP in the SME context by categorising influencing factors into firm-level (e.g., size, age, internal resources) and external/contextual elements (e.g., market dynamics, geography, and sectoral characteristics). While prior research (e.g., Durst & Wilhelm 2012; Massey et al. 2002) identified the general importance of knowledge protection in organisations, this study deepens that understanding by contextualising it specifically for resource-constrained SMEs in a developed economy.

Second, this research contributes to the theoretical development of the Resource-Based View (RBV) by demonstrating how SMEs mobilise their unique yet constrained capabilities such as managerial know-how, flexible structures, and social capital to create customised, often informal or semi-formal KP strategies. This contrasts with the formal, resource-intensive strategies typically assumed in RBV applications in larger firms (Barney 1991; Grant 1996). It reveals how even limited resources, when used creatively, can support competitive advantage through knowledge safeguarding.

Third, the research validates a three-tier typology of KP strategies (formal, semi-formal, informal), contributing to the conceptual clarity of KP mechanisms in SME literature. While earlier studies (e.g., Bessant et al. 2001; Durst 2012) discussed protection in general terms, this study empirically links these strategy types with SME-specific constraints and strategic decisions. In doing so, it provides a nuanced classification system that supports better-targeted academic and policy recommendations for different types of firms.

Together, these theoretical contributions offer a clearer and more empirically grounded understanding of how SMEs approach KP, extending existing literature that often generalises from large firms or overlooks SMEs' specific strategic behaviours.

6.1.1. Implications for Policy and Practice

6.1.1.1. *Implications for Practice*

The findings suggest that KP does not need to be expensive or overly formalised to be effective for SMEs. Many participants demonstrated the possibility of scalable approaches beginning with trust-based systems and low-cost access restrictions, which could later evolve into more structured strategies. SMEs should be encouraged to document critical processes, employ basic access control, and engage in simple awareness-raising activities among staff to enhance knowledge retention and reduce leakage.

This study also underscores the importance of balance: while knowledge sharing is crucial for innovation and collaboration, SMEs must simultaneously implement mechanisms to protect proprietary ideas, client data, and internal methods. Managers should therefore incorporate KP thinking into daily operational decision-making and embed protective practices in recruitment, onboarding, and knowledge transfer.

Crucially, informal and semi-formal mechanisms should not be seen as inferior alternatives to formal protection. Instead, they should be tailored to the firm's operational context and gradually strengthened as the business matures and resources become available.

6.1.1.2. *Implications for Policy*

From a policy perspective, there is a clear need for support programs that address the unique limitations SMEs face in implementing KP. Unlike large firms, SMEs often lack in-house legal expertise, R&D capabilities, or the financial capacity to pursue formal IP rights. Therefore, government agencies and SME support bodies should provide training, tools, and advisory services aimed specifically at smaller businesses.

Policy frameworks should prioritise the inclusion of KP within broader SME development programs, offering accessible templates, case studies, and diagnostic tools to help firms assess and improve their knowledge safeguarding practices. Additionally, policies that promote collaboration between SMEs and research institutions should be accompanied by guidance on how to protect shared knowledge outputs.

Incentives such as subsidies for initial IP filings or the development of internal knowledge systems could also encourage adoption of formal mechanisms where relevant. Ultimately, embedding KP into national SME policy could foster a more resilient and innovation-capable business ecosystem.

6.2. Study Limitations

While the findings of this study offer rich insights, several limitations must be acknowledged. First, the research focused exclusively on SMEs located in Victoria, Australia. This geographic limitation means the findings may not fully represent SMEs operating in other Australian states or under different regulatory, economic, or cultural environments.

Second, the study included SMEs from only four sectors: construction, real estate, retail, and professional services. These are not typically classified as high-tech or knowledge-intensive industries. As such, the study does not capture the KP practices prevalent in creative or technology-driven sectors, where knowledge may be both more codified and more vulnerable to replication.

Third, although prior studies (e.g., Liebowitz, 2006; Durst, 2012) provide insights into knowledge management in SMEs, many of them are situated in different national contexts or assume higher resource availability. The present study diverges from these by adopting a micro, grounded view of Australian SMEs, highlighting practical challenges that are underrepresented in the broader literature.

Additionally, the research employed a qualitative and interpretivist methodology, relying heavily on self-reported data from SME owners and managers. While this approach provided deep contextual insights, it also introduces the potential for subjective bias. Nonetheless, the inclusion of 20 case studies strengthens the validity and allows for some cross-case generalisability, especially given the consistency of the findings with previous literature.

6.3. Future Research Opportunities

Building on this research, several future avenues can be pursued. Firstly, a mixed-methods or quantitative approach could help measure the effectiveness of different KP strategies over time. Such research could track changes in KP maturity as businesses scale or face external shocks, such as digital transformation or economic crises.

Secondly, future studies could explore sector-specific dynamics, especially in high-technology, manufacturing, or creative industries, where knowledge is both core to value creation and more easily replicable. Comparative studies across sectors would allow for greater granularity in policy and practice recommendations.

Thirdly, international or cross-cultural studies could examine how institutional, legal, and cultural factors influence KP strategies in SMEs. For example, comparing SMEs in common-law versus civil-law countries could reveal regulatory influences on formal protection choices.

Finally, a recurring issue during this research was the blurring of “information” and “knowledge” in participant narratives. Future work that explicitly investigates how SMEs conceptualise and operationalise the distinction between knowledge and information protection could produce more tailored frameworks that resonate with business realities. This would also help bridge theoretical constructs with practical implementation.

Knowledge is one of the most valuable and vulnerable assets for any organisation, particularly SMEs, which depend on their people, ideas, and collaborations to survive and grow. This study suggests that while formal protection may be out of reach for many SMEs, there are practical and effective ways to protect knowledge using semi-formal and informal protection strategies that can be implemented using the resources already at hand. By understanding the strategic role of KP and integrating it into everyday business practices, SMEs can build resilience, enhance performance, and secure their competitive edge in an increasingly knowledge-driven economy.

6.4. Reflections

This PhD journey has been one of the most challenging, transformative, and deeply personal experiences of my life. It unfolded not in isolation, but in parallel with another equally significant journey of life and that is motherhood and professional career. Over the course of this research, I gave birth and raised young children, balancing the intense demands of academic work with the all-consuming responsibilities of parenting. I moved from a sessional academic to a full-time academic employee. This dual role shaped not only my schedule but also my perspective. It taught me to be patient with myself, to value small milestones, and to embrace progress even when it came in the quietest or slowest of forms.

Added to this was the impact of the COVID-19 pandemic, which brought about extended periods of uncertainty, disruption, and isolation. Like many others, I was forced to adapt to shift/postpone interviews, to navigate closures and lockdowns, and to manage research progress amidst global upheaval. It was during these times that the importance of resilience became most apparent. Completing this PhD was not a linear process. It was filled with stops and starts, emotional highs and lows, and moments of doubt. But through it all, I found strength in the purpose of the work and in the belief that this research mattered not in the field of academic but also in my personal journey.

Exploring knowledge protection in SMEs, I became acutely aware of how often knowledge is taken for granted, especially in small businesses that are simply trying to survive in competitive and volatile markets. For many of the SMEs I spoke with, knowledge is embedded in people, habits, and informal routines. It is rarely documented, formalised, or seen as something worth protecting until it is lost. This insight resonated with my own

experience: just as in research and parenting, it is often the invisible labour, the unspoken processes, and the undervalued contributions that matter most.

This PhD has not only shaped my academic identity but also changed how I see work, resilience, and value. It has taught me that meaningful research is not only about generating new theory but also about elevating the voices of those often overlooked whether they are small business owners navigating complexity, or researchers managing a thesis while raising a family during a pandemic.

Looking back, I see this thesis not just as an academic contribution, but as a testament to perseverance, purpose, and the power of continuing even when the path ahead feels uncertain. I now carry forward a deeper sense of empathy, clarity, and determination.

References

- Accenture. (2016). *Cybersecurity and Financial Services: Building Resilience in a Digital World*. Accenture Security Report.
- Ackoff, R., 1989, 'From Data to Wisdom', *Journal of Applied Systems Analysis*, vol. 16, pp. 3–9.
- Ahmad, A., Bosua, R. and Scheepers, R., 2014, 'Protecting organizational competitive advantage: a knowledge leakage perspective', *Computers & Security*, vol. 42, pp. 27–39.
- AiGroup, 2015 *The Australian Construction Industry: An Industry Report*. Australian Industry Group.
- Alavi, B., 2000, 'Human resource management information system', *Tadbir Magazine*, vol. 105.
- Alavi, M. and Leidner, D., 2001, 'Review: Knowledge management and knowledge management systems', in *Conceptual foundations and research issues. MIS Quarterly*, pp. 107–136.
- Albert, S. and Bradley, K., 1997, *Managing Knowledge – Experts, Agencies, and Organisations*, Cambridge University Press, Cambridge.
- Ali, M. and Tang, M., 2022, *Informal intellectual property protection methods: A systematic literature review. Journal of the Knowledge Economy*, vol. 13, pp. 2803–2825.
- Allameh, S.M., Zare, S.M. and Davoodi, S.M.R., 2011, 'Examining the Impact of KM Enablers on Knowledge Management Processes', *Procedia Computer Science*, vol. 3, no. 2011, pp. 1211–1223.
- Annansingh, F., 2012, 'Exploring the Risks of Knowledge Leakage: An Information Systems Case Study Approach', *New Research on Knowledge Management Models and Methods*.
- Aslam, M.S., Qammar, A., Ali, I., Yaqub, M. Z., Ahmed, F. and Mohapatra, A.K., 2024, 'Fostering innovation speed and quality in ICT firms: The role of knowledge governance mechanisms, absorptive capacity and environmental dynamism', *Technological Forecasting and Social Change*, vol. 205, 123460.
- Assosia, 2018, *Retail trends and insights: Supply chain developments and forecasting challenges*. Assosia Ltd.
- Audretsch, D. B., & Feldman, M. P., 1996. *R&D spillovers and the geography of innovation and production*. *American Economic Review*, vol. 86, no. 3, 630–640.

Australian Bureau of Statistics Jul2020-Jun2024, *Counts of Australian Businesses, including Entries and Exits*, ABS, viewed 7 August 2025, <<https://www.abs.gov.au/statistics/economy/business-indicators/counts-australian-businesses-including-entries-and-exits/jul2020-jun2024>>.

Australian Bureau of Statistics, 2017, *Australian Industry, 2016-17*. ABS Catalogue No. 8155.0.

Australian Bureau of Statistics, 2018, *Business Use of Information Technology, 2017-18*. ABS Catalogue No. 8129.0.

Australian Bureau of Statistics, 2022, *Australian Industry 2020-21*. ABS Catalogue No. 8155.0.

Australian Government, 2023, *Retail and Wholesale Trade Services*. viewed 8 April 2019, <https://business.gov.au/planning/business-structures-and-types/retail-and-wholesale-trade-services>.

Australian Small Business and Family Enterprise Ombudsman, 2024 *Contribution to Australian Business Numbers*, May 2024. Canberra: ASBFEO viewed on 7 August 2025, https://www.asbfeo.gov.au/sites/default/files/2024-05/Contribution%20to%20Aust%20Business%20Numbers_2024.pdf?

Australia, IP 2018, *Understanding Patents*, Australian Government, viewed 8 April 2019, <https://www.ipaustralia.gov.au/patents/understanding-patents/patent-basics>.

Ayyagari, M., Beck, T., & Demirgüç-Kunt, A., 2007. *Small and medium enterprises across the globe*. Small Business Economics, vol. 29, no. 4, 415–434.
Bagnoli, C. and Vedovato, M., 2012, 'Impact of knowledge management and strategy configuration coherence on SME performance', *Journal of Management & Governance*, vol. 18, no. 1, pp. 615–647.

Beaver, G., 2002. *Small Business, Entrepreneurship and Enterprise Development*. Harlow: Pearson Education.

Beaver, G., & Prince, C., 2004. *Management, strategy and policy in the UK small business sector: A critical review*. Journal of Small Business and Enterprise Development, vol. 11, no. 1, 34–49.

Becerra-Fernandez, I. and Sabherwal, R., 2010, *Knowledge Management: Systems and Processes*, M.E. Sharpe, New York, London.

Beck, T., & Demirgüç-Kunt, A., 2006. *Small and medium-size enterprises: Access to finance as a growth constraint*. Journal of Banking & Finance, vol. 30, no. 11, 2931–2943.

Belsis, P., Kokolakis, S., & Kiountouzis, E., 2005. *Information systems security from a knowledge management perspective*. Information Management & Computer Security, vol.13, no.3, 189–202.

Berisha, G. and Pula, J.S., 2015. Defining small and medium enterprises: A critical review. *Academic Journal of Business, Administration, Law and Social Sciences*, vol. 1, no. 1, pp.17–28.

Bernecker, S. and Dretske, F., 2000, *Knowledge: Readings in Contemporary Epistemology*, Oxford University Press, Oxford.

Biernacki, P. and Waldorf, D., 1981. *Snowball sampling: Problems and techniques of chain referral sampling*. *Sociological Methods & Research*, vol. 10, no. 2, pp.141–163.

Bolisani, E., Paiola, M., and Scarso, E., 2013. Knowledge protection in knowledge-intensive business services. *Journal of Intellectual Capital*, vol. 14, no.1, pp. 192–211.

Bollinger, A.S. and Smith, R.D., 2001, 'Managing organizational knowledge as a strategic asset', *Journal of Knowledge Management*, vol. 5, no. 1, pp. 8–18.

Bracker, J.S., Keats, B.W. and Pearson, J.N., 1986, 'Planning and financial performance among small firms in a growth industry', *Strategic Management Journal*, vol. 7, no. 6, pp. 503–522.

Browning, L. D., & Shetler, J. C., 2000. *Sematech: Saving the U.S. Semiconductor Industry*. Texas A&M University Press.

Bryman, A., 2016. *Social research methods*. 5th ed. Oxford: Oxford University Press.

Burns, T. and Stalker, G.M., 1961, *The Management of Innovation*. London: Tavistock.

Busch, P. and Richards, D., 2007, 'Meaning of Tacit Knowledge', *Australasian Journal of Information Systems*, vol. 1, no. 1.

Byma, J., and Leiponen, A., 2006. Can't block, must run: small firms and appropriation strategies. *Research Policy*, vol. 35, no.9, pp.1220–1232.

Cabrera, Á., and Cabrera, E. F., 2005, *Fostering knowledge sharing through people management practices*. *International Journal of Human Resource Management*, vol. 16, no. 5, pp. 720–735.

Çallı, B.A., Coşkun, E. and Özşahin, M., 2019. ICT adoption in SMEs: Determinants, levels, and influence on the organizational innovativeness. In: *Proceedings of the 12th IADIS International Conference Information Systems 2019*. Algarve, Portugal, 11–13 April 2019.

Carpenter, M. E., 2017, "Characteristics of SMEs." Retrieved 28 October, 2018, from <https://bizfluent.com/info-8714551-characteristics-smes.html>

- Castaneda, D.I. and Toulson, P., 2021, "Is it possible to share tacit knowledge using information and communication technology tools?", *Global Knowledge, Memory and Communication*, vol. 70 no. 8/9, pp. 673-683.
- Chennamaneni, A., 2006, *Determinants of Knowledge Sharing Behaviors: Developing and Testing an Integrated Theoretical Model*, University of Texas Arlington.
- Chesbrough, H., 2011. Bringing open innovation to services. *MIT Sloan Management Review*, vol. 52, no. 2, pp. 85–90.
- Child, J., 1972, 'Organizational structure, environment and performance: The role of strategic choice', *Sociology*, vol. 6, no. 1, pp. 1–22.
- Cohen, W. M., Nelson, R. R., & Walsh, J. P., 2000. *Protecting their intellectual assets: Appropriability conditions and why U.S. manufacturing firms patent (or not)*. NBER Working Paper No. 7552.
- Contigiani, A. and Testoni, M., 2023. Geographic isolation, trade secrecy, and innovation. *Research Policy*, vol. 52, no. 8, pp. 1-17.
- Cooper, P., 2010, 'Data, information and knowledge', *Anaesthesia & Intensive Care Medicine*, vol. 11, no. 12, pp. 505–506.
- Curado, C. and Vieira, S., 2019, "Trust, knowledge sharing and organizational commitment in SMEs", *Personnel Review*, vol. 48 no. 6, pp. 1449-1468.
- Curran, J. and Blackburn, R.A., 2001. *Researching the Small Enterprise*. London: Sage Publications.
- Darroch, J., 2005, 'Knowledge management, innovation and firm performance', *Journal of Knowledge Management*, vol. 9, no. 3, pp. 101–115.
- Dedeche, A., 2014, 'Protecting Organizational Knowledge: A Strategic Perspective Framework', *The University of Melbourne*.
- Denzin, N.K. and Lincoln, Y.S., 2011. *The Sage Handbook of Qualitative Research*. 4th ed. Thousand Oaks: Sage Publications.
- Dreyfus, H., 2001, *On the Internet*, Routledge, New York.
- Durst, S. and Wilhelm, S., 2012, 'Knowledge management and succession planning in SMEs', *Journal of Knowledge Management*, vol. 16, no. 4, pp. 637–649.
- Durst, S. Edvardsson, I.R. and Foli, S., 2023, 'Knowledge management in SMEs: a follow-up literature review', *Journal of Knowledge Management*, vol. 27, no. 11, pp.25–58.
- Dyer, J. H. and Nobeoka, K., 2000, Creating and managing a high-performance knowledge-sharing network: The Toyota case. *Strategic Management Journal*, vol. 21, no. 3, pp. 345–

367.

Edwards, J.S., 2005, *Business Processes and Knowledge Management*.

Eisenhardt, K.M. and Martin, J.A., 2000, 'Dynamic capabilities: what are they?', *Strategic Management Journal*, vol. 21, no. 10–11, pp. 1105–1121.

Ess, C., 2003, 'Liberal arts and distance education: Can Socratic virtue (arete) and Confucius' exemplary person (junzi) be taught online?', *Arts and Humanities in Higher Education*, vol. 2, no. 2, pp. 117–137.

European Commission 2012, *What is an SME*, Internal Market, Industry, Entrepreneurship and SMEs.

Frishammar, J., Ericsson, K. and Patel, P.C., 2015, 'The dark side of knowledge transfer: Exploring knowledge leakage in joint R&D projects', *Technology Analysis & Strategic Management*, vol. 27, no. 3, pp. 249–264.

Gillham, B., 2005. *Research Interviewing: The Range of Techniques*. Maidenhead: Open University Press.

García-Holgado, A., García-Peñalvo, F.J., Hernández-García, Á. & Llorens-Largo, F., 2015, 'Analysis and improvement of knowledge management processes in organizations using the Business Process Model Notation', in Palacios-Marqués, D, Soriano, DR & Huarng, KH (eds), *Springer International Publishing*.

Gold, A.H., Malhotra, A. & Segars, A.H., 2001. Knowledge management: An organizational capabilities perspective. *Journal of Management Information Systems*, vol. 18, no. 1, pp.185-214.

Goucher, W., 2011, 'Do SMEs have the right attitude to security?', *Computer Fraud & Security*, vol. 2011, no. 7, pp. 18-20

Grant, R.M., 1996, 'Toward a knowledge-Based Theory of the Firm', *Strategic Management Journal*, vol. 17, no. S2, pp. 109-22.

Guest, G., Bunce, A. and Johnson, L., 2006. How many interviews are enough? An experiment with data saturation and variability. *Field Methods*, vol. 18, no. 1, pp. 59-82.

Gupta, A. & Govindarajan, V., 2000, 'Knowledge flows within multinational corporation', *Strategic Management Journal*, vol. 21, no. 4, pp. 473-496.

Hakim, C., 2007, 'Research Design: Successful designs for social and economic research', 2nd edn, Routledge, New York, USA.

Hall, J., & Sapsed, J. (2005). *Influences of knowledge protection practices on innovation and performance in project-based firms*. *International Journal of Project Management*, vol. 23, no. 5, 367-377.

Hanel, P., 2006, 'Intellectual property rights business management practices: A survey of the literature', *Technovation*, vol. 26, no. 8, pp. 895-931.

Heckathorn, D.D., 2002. Respondent driven sampling II: Deriving valid population estimates from chain referral samples of hidden populations. *Social Problems*, vol. 49, no. 1, pp.11-42.

Hemonnet-Goujot, A., Ivens, B.S. and Pardo, C., 2022 'Developing dynamic capabilities through inter-organizational relationships: An empirical study', *Industrial Marketing Management*, vol. 103, pp. 1-12.

Hesse-Biber, S.N. and Leavy, P., 2011, *The Practice of Qualitative research*, 2nd edn, Sage publication, California, USA.

Jamshed, S., 2014, 'Qualitative research method-interviewing and observation', *Journal of Basic and Clinical Pharmacy*, vol. 5, no. 4, pp. 87-88.

Jarrar, Y., Schiuma, M. and Zairi, M., 2015, 'Defining Organisational Knowledge', *European Centre for Best Practise Management*, vol. 1, pp. 1-10.

Jarrahi, M.H., 2013, *Social Technologies and Informal Knowledge Sharing within and across Organizations*, School of Information Studies - Dissertations.

Jennings, P., & Beaver, G. (1997). *The performance and competitive advantage of small firms: A management perspective*. *International Small Business Journal*, vol. 15, no. 2, 63-75.

Kankanhalli, A., Tan, B. C. Y., & Wei, K. K., 2003. *Contributing knowledge to electronic knowledge repositories: An empirical investigation*. *MIS Quarterly*, vol. 27, no. 1, 113-143.

Karadag, H., 2016 'The role of SMEs and entrepreneurship on economic growth in emerging economies within the post-crisis era: An analysis from Turkey', *Journal of Small Business and Entrepreneurship Development*, vol. 4, no. 1, pp. 22-31.

Keramati, A. and Azadeh, M.A., 2007 'Exploring the effects of top management characteristics on knowledge management practices', *International Journal of Technology Management*, vol. 39, no. 1-2, pp. 91-111.

Kimble, C., 2013, 'Knowledge Management, Codification and Tacit Knowledge', *Information Research*, vol. 18, p. 557.

Kucharska, W., Balcerowski, T., Kucharski, M. and Jussila, J., 2024. How does the relationship between the mistakes acceptance component of learning culture and tacit knowledge-sharing drive organizational agility? Risk as a moderator. *Proceedings of the 25th European Conference on Knowledge Management*, [online] viewed 4 July 2025, <https://papers.academic-conferences.org/index.php/eckm/article/view/2367>

- Lee, S., Park, G., Yoon, B., & Park, J., 2010. *Open innovation in SMEs-An intermediated network model*. Research Policy, vol. 39, no. 2, 290-300.
- Lee, C., Lee, K. and Pennings, J.M., 2001, 'Internal Capabilities, External Networks, and Performance: A Study on Technology-Based Ventures', *Strategic Management Journal*, vol. 22, pp. 615-640.
- Lee, T.S., Shiue, Y.C. and Chen, C.Y., 2016. The influence of top management knowledge value on knowledge sharing practice. *International Journal of Information Management*, vol. 128, pp. 788-798.
- Leon, M., Lukandu, A.I. and Kasamani, S.B., 2011. Continuous data protection as a strategy for reduced data recovery time. *Journal of Systems Integration*, vol. 2, pp.54-69.
- Madni, A.M., 2010, 'Value-based systems engineering: A case study approach', *Systems Engineering*, vol. 13, no. 1, pp. 4-14.
- Marr, B., Schiuma, G. and Neely, A., 2002, 'Assessing strategic knowledge assets in e-business', *International Journal of Business Performance Management*, vol. 4, no. 4, pp. 279-295.
- Maskell, P., and Malmberg, A., 1999, 'The competitiveness of firms and regions: 'Ubiquitification' and the importance of localized learning', *European Urban and Regional Studies*, vol. 6, no. 1, pp. 9-25.
- Mata, M.N., Moleiro Martins, J. and Inácio, P.L., 2024, "Collaborative innovation, strategic agility, & absorptive capacity adoption in SMEs: the moderating effects of customer knowledge management capability", *Journal of Knowledge Management*, Vol. 28 No. 4, pp. 1116-1140.
- Matejun, M., 2014. The role of flexibility in building the competitiveness of small and medium enterprises. *Management*, vol. 18, no. 1, pp.154-168.
- Miles, M.B., Huberman, A.M. and Saldaña, J., 2014. *Qualitative Data Analysis: A Methods Sourcebook*. 3rd ed. Thousand Oaks, CA: Sage Publications.
- Minichiello, V., 1995, *In-depth interviewing*, Pearson, Prentice Hall, Sydney.
- Mijnhardt, F., Baars, T. and Spruit, M., 2016. *Organizational characteristics influencing SME information security maturity*. Journal of Computer Information Systems, vol. 56, no. 2, pp.106-115.
- Min, M., Zhou, X. and Zhang, Z., 2023, 'Interactive mechanisms between formal and informal knowledge governance mechanisms in predicting knowledge processes in China', *Knowledge Management Research & Practice*, vol. 22, no. 3, pp. 256-268.

Mintzberg, H., 1979. *The Structuring of Organizations: A Synthesis of the Research*. Englewood Cliffs, NJ: Prentice-Hall.

Moos, M. and Melodi, D., 2016, 'Growth and performance of young firms: The role of age, size, and experience', *Journal of Small Business Strategy*, vol. 26, no. 1, pp. 1-20.

National Business Association, 2025, *The Impact of Small Businesses on the United States Economy*. viewed 5 August 2025, <https://nationalbusiness.org/the-impact-of-small-businesses-on-the-united-states-economy/>.

Neagu, C., 2016, 'The Importance and Role of Small and Medium-Sized Businesses', *Theoretical and Applied Economics*, vol. 23, no. 3, pp. 331-338.

Nonaka, I. and Takeuchi, H., 1995, *The Knowledge-Creating Company*, Oxford University Press, New York.

OECD, 2017. *Enhancing the Contributions of SMEs in a Global and Digitalised Economy*. OECD Publishing.

OECD, 2005, *OECD SME and Entrepreneurship Outlook: 2005*, OECD, Paris, p. 17.

Olander, H., Hurmelinna-Laukkanen, P.I.A and Heilmann, P., 2009, "What's small size got to do with it? Protection of intellectual assets in SMEs", *International Journal of Innovation Management*, vol. 13, no. 3, pp. 349-70.

Olander, H., Hurmelinna-Laukkanen, P.I.A. and Vanhala, M., 2014. Mission: possible but sensitive knowledge protection mechanisms serving different purposes. *International Journal of Innovation Management*, vol. 18, no. 6, pp.1-24.

Paalysaho, S., and Kuusisto, J., 2011. Intellectual property protection and the performance of technology companies: An analysis of Finnish SMEs. *International Journal of Innovation and Technology Management*, vol. 8, no. 2, pp. 239-256.

Paasi, J., Valkokari, K., Hytönen, J., Huhtilainen, L., and Nystén-Haarala, S., 2012. *Bazaar of opportunities for new business development: Bridging networked innovation, intellectual property and business*. Imperial College Press.

Parsaye, K. and Chignell, M., 1988, *Expert Systems for Experts*, Wiley, New York.

Peteraf, M.A., 1993, 'The cornerstones of competitive advantage: A resource-based view', *Strategic Management Journal*, vol. 14, no. 3, pp. 179-191.

QBCC 2020, *Classification Summary of Buildings and Structures*, viewed 24 October 2020, <https://www.qbcc.qld.gov.au/sites/default/files/BCA%20Classes%20of%20Building.pdf>.

Radipere, S. and Dhlwayo, S., 2014, 'The role of age and business size on small business performance in the South African small enterprise sector', *Problems and Perspectives in Management*, vol. 12, no. 4, pp. 7-12.

- Roehrich, K., Selviaridis, K., Kalra, T., Van der Valk, W., and Fang, F., 2019, 'Inter-organizational governance: A review, conceptualisation and extension', *International Journal of Operations & Production Management*, vol.39, no. 9, pp. 887-917.
- Rowley, J., 1998. *Information management in the digital organization*. London: ASLIB.
- Savino, T., Messeni Petruzzelli, A. and Albino, V., 2017, "Search and recombination process to innovate: a review of the empirical evidence and a research agenda", *International Journal of Management Reviews*, Vol. 19 No. 1, pp. 54-75.
- Savlovski, L.I. and Robu, N.R., 2011, 'The role of SMEs in modern economy', *Economy Transdisciplinarity Cognition*, vol. 14, no. 1, pp. 459-465.
- Shrafat, F. D., 2018. The impact of knowledge management infrastructure on knowledge management effectiveness: A survey in the Jordanian telecommunication sector. *Journal of Knowledge Management*, vol. 22, no. 5, pp. 1055-1078.
- SME Corp. Malaysia, 2021. *SME Annual Report 2020/21: A Resilient SME Ecosystem – Anchoring the Nation's Growth*. viewed 27 July 2021, <https://www.smecorp.gov.my>
- Sellitto, C., Banks, D., Bingley, S. and Burgess, S., 2016. *Small businesses and effective ICT: Stories and practical insights*. 1st ed. Abingdon: Routledge.
- Sowell, T 1996, *Knowledge and Decisions*, Basic Books, New York.
- Seronato, K.M. and Martins, T.S., 2024. The role of SME's owner-manager decision-making styles in marketing strategies and organizational performance. *Journal of Research in Marketing and Entrepreneurship*, vol. 26, no.4, pp.612-641.
- Spithoven, A., Vanhaverbeke, W. and Roijakkers, N., 2013. Open innovation practices in SMEs and large enterprises. *Small Business Economics*, vol. 41, no. 3, pp.537-562.
- Stonier, T 1997, *Information and Meaning: An Evolutionary Perspective*, Springer, Berlin.
- Tan, S.S., Teo, H.H., Tan, B.C.Y. and Wei, K.K., 1998, *Developing a Preliminary Framework for Knowledge Management in Organization*, viewed 27 February 2019, <http://aisel.aisnet.org/amcis1998/211>.
- Teece, D. J., 1986. *Profiting from technological innovation: Implications for integration, collaboration, licensing and public policy*. *Research Policy*, vol. 15, no. 6, 285-305.
- Teece, D.J., Pisano, G. and Shuen, A., 1997, 'Dynamic capabilities and strategic management', *Strategic Management Journal*, vol. 18, no. 7, pp. 509-533.
- Tehseen, S., Sajilan, S., Ramayah, T. and Gadar, K., 2015. *An intra-cultural study of entrepreneurial competencies and SMEs business success in wholesale and retail industries*

of Malaysia: A conceptual model. Review of Integrative Business and Economics Research, vol. 4, no. 3, pp.33-48.

Thalmann, S. and Manhart, M., 2015, 'Balancing Knowledge Protection and Sharing in Networks of SME', Academy of management proceedings viewed 30 June 2025.

Thalmann, S., Ilvonen, I., Manhart, M. and Sillaber, C., 2016. Knowledge protection for digital innovations: Integrating six perspectives. *WISP 2016 Proceedings* viewed 27 June 2025, <https://aisel.aisnet.org/wisp2016/15>

Thuy, L.T.B., 2023, 'The relationship between financial resources and firm performance: Empirical evidence from small and medium enterprises', *Journal of Small Business Management*, vol. 61, no. 2, pp. 312-329.

Treem, J. W., & Desouza, K. C., 2012. The unwanted transfer of knowledge: Knowledge leakage and knowledge loss in organizations. *Organizational Dynamics*, vol. 41, no. 2, pp. 117–125.

U.S. Copyright Office, 2016, *Copyright basics* (Circular 1). Washington, DC: U.S. Copyright Office. viewed 29 July 2019, <https://www.copyright.gov/circls/circ01.pdf>

Van den Hooff, B., & de Ridder, J. A., 2004. *Knowledge sharing in context: The influence of organizational commitment, communication climate and CMC use on knowledge sharing*. Journal of Knowledge Management, vol. 8, no. 6, 117-130.

Volberda, H.W., 1996, 'Toward the flexible form: How to remain vital in hypercompetitive environments', *Organization Science*, vol. 7, no. 4, pp. 359-374.

Walsh, J. P., and Ungson, G. R., 1991, Organizational memory. *Academy of Management Review*, vol. 16, no. 1, pp. 57-91.

Wang, C. L., & Ahmed, P. K., 2004. *The development and validation of the organisational innovativeness construct using confirmatory factor analysis*. European Journal of Innovation Management, vol. 7, no. 4, 303-313.

Waribugo, S. and Ekom Etim, E., 2016, 'Organizational structure and implementation of strategy in Nigerian manufacturing firms', *IOSR Journal of Business and Management*, vol. 18, no. 2, pp. 20-27.

World Intellectual Property Organization (WIPO), 2020. *WIPO Intellectual Property Handbook: Policy, Law and Use*. Geneva: WIPO.

Yin, R.K., 2014. *Case study research: design and methods*. 5th ed. Thousand Oaks, CA: Sage Publications.

- Yin, R.K., 2018. *Case study research and applications: Design and methods*. 6th ed. Thousand Oaks, CA: SAGE Publications.
- Zack, M., 1999, 'Developing a Knowledge Strategy', *California Management Review*, vol. 41, no. 3, pp. 125–145.
- Zhou, K.Z. and Wu, F., 2010, 'Technological capability, strategic flexibility, and product innovation', *Strategic Management Journal*, vol. 31, no. 5, pp. 547-561.
- Zins, C., 2007, 'Conceptual Approaches for Defining Data, Information, and Knowledge', *Journal of the American Society for Information Science and Technology*, vol. 58, no. 4, pp. 479-493.

Appendices

8.1. Appendix One: Resource-Based View

This study was informed by resource-based view theory. This section introduces the underlying theory that guided analysis of the study results. The resource-based view (RBV) takes an 'inside-out' view or firm specific perspective on why organisations succeed. RBV defines a business as a bundle of resources. Resources generally include assets, infrastructure, capabilities, skills, processes and knowledge (Rivard, Raymond & Verreault 2006). Sometimes these resources can be categorised as physical resources (physical, technology, equipment and tools), organisational resources (formal structure, policies and procedures) and human resources (training, experience and skills). Resources that are valuable, rare, imperfectly imitable and imperfectly substitutable (known as VRIN) are the main sources of competitive advantage for sustained superior performance.

According to Madni (2010), a resource must fulfill the 'VRIN' criteria to provide competitive advantage and sustainable performance. The VRIN criteria is as below:

Valuable (V): Resources are valuable only if they provide strategic value to the firm and help in exploiting opportunities.

Rare (R): resources must be difficult to find, rare and unique to offer competitive advantage. Resources possessed by several companies cannot design or produce anything unique hence will not provide any competitive advantage.

Imperfect Imitability: Resources which are harder to copy or imitate provide a basis for sustained competitive advantage.

Non-Substitutability: Non-substitutability of resources implies that they cannot be replaced by alternative resources. Hence, competitors cannot achieve same performance by replacing resources.

Valuable resources must enable a firm to do things in a way that can lead to enhanced performance, increased revenue, and/or higher sales and implement related strategies to enhance business performance (Barney 1991).

RBV has been identified as an especially useful theory to identify the basis by which the resources and capabilities of a firm serve as a source of sustained competitive advantage. Hence, in the study the use of RBV assists in explaining why industries (usually, but not always in the same sector) vary in performance, suggesting that a business' stock of resources and their creative utilization can have a significant effect on its performance capability (Soto-Acosta & Merono-Cerdan 2008). Businesses use their resources to develop

internal competencies (for instance, competencies that enable them to introduce KP strategies) or external capabilities (such as the capability to share knowledge with other business partners) (Rivard, Raymond & Verreault 2006). The central proposition of RBV is that firms that possess and control resources that are unique, rare, valuable, imperfectly imitable and not substitutable would obtain competitive advantage and improved performance. This study will identify how SMEs use their resources to develop strategies for the protection of one of their most important resources, knowledge.

The RBV approach provides a useful framework to evaluate an organisation's internal capacities based on what is most valuable in its industry. As discussed earlier, business resources are often divided into two main categories: tangible and intangible. Tangible resources include financial capital, materials, and physical assets, while intangible resources cover areas like technological know-how, organisational culture, and customer loyalty. A company's ability to manage and use these sector-specific resources to deliver different types of services or products plays a major role in shaping its competitive strength (Eisenhardt & Martin 2000).

Madhavan & Grover (1998) found that innovation is a process of knowledge management and innovative firms are regarded as knowledge creating entities. Based on RBV, firms are considered as a unique combination of resources and capabilities. This requires the firms to build, integrate or reconfigure resources and capabilities which will ultimately lead towards long term improved firm performance (Abidi 2014).

Firm resources are heterogeneous, meaning that different firms possess and utilize varied types of resources in distinct ways (Barney 1991). While organisations may acquire similar resources, their ability to leverage these resources effectively can differ significantly due to variations in capabilities, culture, and knowledge application. The resource-based view (RBV) highlights that competitive advantage arises not just from possessing valuable resources, but from using them in ways that are rare, inimitable, and well-organised (Barney 1991; Wernerfelt 1984). Some firms may struggle to convert acquired knowledge into practice effectively, not due to the absence of resources, but because of an inability to integrate and apply them optimally compared to competitors. This disparity underscores RBV's focus on internal strengths and weaknesses as a basis for sustainable competitive advantage.

An empirical investigation into the significance of intellectual capital and strategic orientations on innovation capability and firm performance in Malaysia used RBV to develop a conceptual framework. The study identified that innovation capability is one of the most important elements of capabilities critical for the survival and success of an organisation over time. The

theoretical perspective of RBV asserts that innovation capability meets the criteria of being a source for competitive advantage (Abidi 2014). RBV has been used to successfully explain how firms achieve competitive advantage and can also sustain it over a longer period based on their bundles of resources and capabilities and their exploitation of these. The theoretical perspective of RBV has asserted that innovation capability meets the criteria of competitive advantage. Firms need capability to innovate and improve innovative performance. The study concluded that to enhance innovation performance, firms not only depend on their resource stock but also their ability to use the resources creatively (Abidi 2014).

Cataldo, Pino and Mcqueen (2020) examined the effects that different combinations of ICT have on the performance indicators of microenterprises and SMEs (MSMEs) of a developing economy. The researcher focused on two questions: First, whether the impact of ICT differs according to different ICT assets used in companies. Second, whether the effects of these combined ICT change according to the company size, especially for MSMEs in emerging countries. Based on RBV, the researcher concluded that different combinations of ICT have different effects on performance indicators of MSMEs. Results showed that the sales revenue and profitability of businesses were directly impacted with the use of more advanced and unique ICT assets (Cataldo, Pino & Mcqueen 2020).

RBV theory was also used by Tehseen et al. (2019) to understand the mediating effects of ICT based network competence in the relationship between strategic competency and firms' competitive advantage in the context of Malaysian manufacturing SMEs. The research framework was developed based on the RBV theory by integrating the concepts of strategic competency and ICT based network competence. The study argues that strategic competency is the strongest predictor of competitive advantage of SMEs, and this supports the theory of RBV that unique and rare resources generate the competitive advantage for firms (Tehseen, Yafi, Sajilan, Rehman & Butt 2019).

Based on RBV theory, the smaller sized businesses face a scarcity of resources like finances, time, infrastructure and skills to know if and how to introduce KP effectively, as well knowing how to assemble the limited resources that work together to create organisational capabilities (Soto-Acosta & Merono-Cerdan 2008).

In this study, RBV is used as a means to explore the use of participating SMEs' resources, competences and capabilities to improve their business operations and allows a comparison between and across industry sectors.

8.2. Appendix Two: Interview Questions

The interview will start with demographic questions first and then lead to questions targeted specifically on research topic of Knowledge protection strategies. The first round of interview questions that will be used to gather data are as below:

Ques1: How long has your company been in business?

Ques2: What is the size of your company? How many departments all together?

Ques3: What are the main services provided by your company?

Ques4: What are the main areas in Australia your company works in?

Ques 5: What is your title in the company?

Ques6: How long have you been in your current position?

Ques7: How important do you think is it to implement knowledge protection strategies?

Ques8: Do you hire expert knowledge managers, or your IT managers are responsible towards this?

Ques9: What type of protection methods are used by your company?

Ques10: Which of the KP strategies are used to protect Tacit knowledge?

Ques 11: Which of the KP strategies are used to protect Explicit knowledge?

Ques 12: What kind of protection methods are considered as important?

Ques13: Is there a relationship between structural characteristics and implementation of KP strategies?

Ques14: Whether the type of services provided by the company effects the implementation of KP strategies?

Ques 15: What is the effect of market competition on implementation of KP strategies?

8.3. Appendix Three: Information Sheet

INFORMATION TO PARTICIPANTS INVOLVED IN RESEARCH

You are invited to participate

You are invited to participate in a research project entitled *use and implementation of knowledge protection strategies by Australian SMEs*.

This project is being conducted by Mandeep Dhindsa and supervised by Dr, Scoot Bingley from the College of Business at Victoria University.

Project explanation

The purpose of the study is to explore the use and implementation of knowledge protection strategies by Australian SMEs. The focus of this study to identify whether Australian SMEs believe in investing to protect their organizational knowledge or not. If yes, then what practices are implemented and if not, then what are the barriers.

Based on literature review of past studies it has been found that SMEs usually do not invest in specific knowledge protection strategies. But all the studies were performed outside Australia. So, this study would like to explore Australian SMEs and identify if the story is same or different. This study is a pilot study for further investigation as part of PhD pursued from Victoria University by the researcher.

What will I be asked to do?

An invitation has been made to you to participate in this research by being interviewed. Participation in this study is purely voluntary and you can withdraw at any time of the interview by simply informing the interviewer that you wish to do so. There are no costs associated with participation in this research apart from your time. Should you agree to participate, completion of the interview will take approximately 30-45 minutes. All interviews will be documented and then transcribed ready for analysis. If you do not wish to be recorded you will not be simply informing the interviewer of this. All data that is collected from the interview process will stored in a secure area and files will be password protected this data will only be accessed by the researchers. The information you submit cannot be directly linked to you or your business, hence you cannot be identified.

What will I gain from participating?

Your participation will contribute to explore how SMEs protect their organizational knowledge from being leaked, altered or misused. What strategies are used and if companies do not invest then what are the barriers. The study will report on best strategies to protect knowledge. It is anticipated that the results of this study will be reported through academic articles/reports written by the researchers.

How will the information I give be used?

The data gathered from the study's participants will be transcribed, coded and then analysed. Your anonymity is assured and we will only report the results of this study in an aggregate (i.e. all responses) format. All collected data will be secured in a cabinet in the office of Dr Scott Bingley at Victoria University's Footscray Park Campus for 5 years. Only the researchers will have access to the data. It is anticipated that the data collected in the study will be used for writing journal articles and be the basis for academic conference presentations.

What are the potential risks of participating in this project?

There are no potential risks associated from participating in this project. Participation in the study is voluntary and anonymous. Participants are advised not to answer any questions in the interview that they are uncomfortable answering. You can discontinue from participating in the interview at any stage just indicate this to the researchers. Equally important, no business or individual will be identified in the study. Non-identifying codes or pseudonyms will be used in reporting results to ensure participants' confidentiality.

How will this project be conducted?

Your participation in this study simply requires you to be interviewed. Participation is voluntary and no business or individual will be identified in the study. The only responsibility held by you as a participant in this study is to respond to each interview question. There are no correct or incorrect responses. We simply ask that you provide your responses as honestly as you can. If at any time while completing the questions you decide you do not want to participate further, you can simply withdraw from the study. Before you commence the interview you will be asked to sign a consent form indicating that you are at least 18 years of age and that have voluntarily given your consent to participating in the study.

Who is conducting the study?

The Principal Investigator supervising this study is Dr Scott Bingley (Victoria University)

Contact address: College of Business, Victoria University, PO Box 14428, Melbourne, VIC 8001.

Phone: +61 3 9919 5049

Email: scott.bingley@vu.edu.au

Student investigator are:

Mandeep Dhindsa

Phone +61 4xxxxxxxxx

Email: Mandeep.dhindsa@live.vu.edu.au

Any queries about your participation in this project may be directed to the Chief Investigator listed above.

If you have any queries or complaints about the way you have been treated, you may contact the Ethics Secretary, Victoria University Human Research Ethics Committee, Office for Research, Victoria University, PO Box 14428, Melbourne, VIC, 8001, email researchethics@vu.edu.au or phone (03) 9919 4781 or 4461.

8.4. Appendix Four: Consent form

CONSENT FORM FOR PARTICIPANTS INVOLVED IN RESEARCH

INFORMATION TO PARTICIPANTS:

We would like to invite you to be a part of a study that examines use and implementation of knowledge protection (KP) strategies by Australian SMEs.

The study aims to capture the perceptions of small businesses in an endeavour to explore the use of knowledge protection strategies. The main research question is what knowledge protection practices are used by SME's.

The study uses a selection of small and medium businesses located in Melbourne (urban) to explore and shed light on the adoption of KP. Results of the study will help in identifying whether SMEs invest in implementing KP practices. If yes, then what strategies are adopted and if not, then what are the barriers. The study uses semi-structured interview questions to gather appropriate data from you. There are no risks associated with the study and participation is purely voluntary and you can withdraw at any time of the interview by simply informing the interviewer that you wish to do so. You or your business will not be identified in any transcripts, summary or publications that eventuate from the study.

CERTIFICATION BY SUBJECT

I, _____ of _____ certify that I am at least 18 years old* and that I am voluntarily giving my consent to participate in the study: *Use and implementation of KP by Australian SMEs* being conducted at Victoria University by Mandeep Dhindsa of Victoria University.

I certify that the objectives of the study, together with any risks and safeguards associated with the procedures listed hereunder to be carried out in the research, have been fully explained to me by:

Mandeep Kaur Dhindsa

and that I freely consent to participation involving the below mentioned procedures:

- Being interviewed in order to gather appropriate data about the study

I consent to this interview being recorded.

I certify that I have had the opportunity to have any questions answered and that I understand that I can withdraw from this study at any time and that this withdrawal will not jeopardise me in any way.

I have been informed that the information I provide will be kept confidential.

Signed:

Date:

Any queries about your participation in this project may be directed to the researcher

Dr Scott Bingley at the College of Business, Victoria University, PO Box 14428, Melbourne, VIC 8001.

If you have any queries or complaints about the way you have been treated, you may contact the Ethics Secretary, Victoria University Human Research Ethics Committee, Office for Research, Victoria University, PO Box 14428, Melbourne, VIC, 8001, email Researchethics@vu.edu.au or phone (03) 9919 4781 or 4461.

[*please note: Where the participant/s are aged under 18, separate parental consent is required; where the participant/s are unable to answer for themselves due to mental illness or disability, parental or guardian consent may be required.]

8.5. Appendix Five: Ethics approval form

Your ethics application has been formally reviewed and finalised.

- » Application ID: HRE18-108
- » Chief Investigator: DR SCOTT BINGLEY
- » Other Investigators: MRS Mandeep Kaur Dhindsa
- » Application Title: Use and implementation of Knowledge Protection(KP) strategies by Australian Information and Communication Technology Small and Medium Sized Enterprises.
- » Form Version: 13-07

The application has been accepted and deemed to meet the requirements of the National Health and Medical Research Council (NHMRC) 'National Statement on Ethical Conduct in Human Research (2007)' by the Victoria University Human Research Ethics Committee. Approval has been granted for two (2) years from the approval date; 05/07/2018.

Continued approval of this research project by the Victoria University Human Research Ethics Committee (VUHREC) is conditional upon the provision of a report within 12 months of the above approval date or upon the completion of the project (if earlier). A report proforma may be downloaded from the Office for Research website at: <http://research.vu.edu.au/hrec.php>.

Please note that the Human Research Ethics Committee must be informed of the following: any changes to the approved research protocol, project timelines, any serious events or adverse and/or unforeseen events that may affect continued ethical acceptability of the project. In these unlikely events, researchers must immediately cease all data collection until the Committee has approved the changes. Researchers are also reminded of the need to notify the approving HREC of changes to personnel in research projects via a request for a minor amendment. It should also be noted that it is the Chief Investigators' responsibility to ensure the research project is conducted in line with the recommendations outlined in the National Health and Medical Research Council (NHMRC) 'National Statement on Ethical Conduct in Human Research (2007).'

On behalf of the Committee, I wish you all the best for the conduct of the project.

Secretary, Human Research Ethics Committee

Phone: 9919 4781 or 9919 4461

Email: researchethics@vu.edu.au

8.6. Appendix Six: Data Analysis Table

	CONSTRUCTION					Overall	
Category	Factor	CON1	CON2	CON3	CON4	Sector	REL1
Organisational and other factors	Sector	Moderate impact	Moderate impact	Moderate impact	Moderate impact	Moderate impact	The business sector seems to have a
	Location	Unclear	Unclear	Probably no impact	Probably no impact	Unclear or no impact	The geographical location of business does seem to have
	Age of business (in years)	Direct impact	Direct impact	Direct impact	Direct impact	Direct impact	The age of business years is seen to be a factor
SME characteristics	Small Size	Direct impact	Direct impact	Direct impact	Direct impact	Direct Impact	The business is a medium business and
	Owner/Manager characteristics	Moderate impact	Minor impact	Direct impact	Direct impact	Moderate to direct impact	The business is managed by the director and the business experience
	Flexibility	Direct impact	Direct impact	Direct impact	Moderate impact	Likely direct impact	Flexibility offered by small size of the business
	relationships	Direct impact	Direct impact	Direct impact	Direct impact	Direct impact	Relationships with external business suppliers etc.
KP Strategies adopted (informal; semi-formal; formal)		Mix of informal and semi-formal strategies	Mix of informal and semi-formal strategies	Mix of formal, informal and semi-formal strategies.	Mix of formal, informal and semi-formal strategies.	Mostly informal and semi-formal strategies, but also formal strategies in	The business mostly adopts informal semi-formal protection methods as copy right cabinet
Evaluation							

8.7. Appendix Seven: Sample Interview Transcript

Interview Transcript METPST2

Interview was scheduled at participants office. We introduce each other on first name basis. He tells me what he knows about the interview. Interviewer again explained to the interviewee about the purpose and confidentiality about the interview.

Interviewee is the founder and the director of the company. Researcher would like to interview IT managers or knowledge managers but because business was self-owned so the company's director himself was responsible for looking after all the main functional areas like accounts, IT and Services. It services were received from an IT service provider and a contractor is hired for all required publications.

Interview Questions:

Ques 1: How long has your company been in business?

Ans: 4 years.

Ques 2: What is the size of the company? How many departments all together?

Ans: Just himself but do have contractor. Zero departments

Ques 3: What are the main services provided by your company?

Ans: Company offers compliance services covering a whole spectrum of compliance advice including Identification of compliance obligations, requirements and commitments for key compliance areas to recommendations on the design and implementation of compliance management systems. Clients range from start-ups in education industry who require comprehensive compliance consulting services to clients who have experienced rapid expansion and find that their systems and processes have not been able to cope. Consulting services to acquire compliance accreditation to higher education providers (HEP). Also help clients preparing for internal audits, internal reviews and peer reviews.

Ques 4: What are the main areas in Australia your company works in?

Ans: Focus is education industry in NSW, Tasmania, South Australian and Victoria.

Ques 5: What is your title in the company?

Ans: Founder and Director.

Que 6: How long have you been I your current position?

Ans: 4 years.

Ques 7: How important do you think is it to implement knowledge protection strategies?

Ans: Very important. As a consultant participant deals with several clients all over Australia. So, he takes knowledge protection very seriously. Information contained in compliance documents is very sensitive and confidential, so the participant makes sure that there is no leakage of information across his client base. Participant also hires a contractor for publishing client reports and he takes extra care that only required information is provided to the contractor and confidential information is handled

with extra care and responsibility. Participant gave an example where he met a client who understand RTO but had no idea about education and compliance. So the participant explained the terms without providing any direct references to any of his clients.

Ques 8: Do you hire expert knowledge managers, or IT managers are responsible towards this?

Ans: No, all the compliance documents which contain sensitive information are handled by the participant himself and only softcopies are kept which are securely saved on his laptop and personal desktop. A back copy is saved on participants drop box.

Ques 9: What type of protection methods are used by your company?

Ans: No specific formal method implemented for knowledge protection because of the small size. But informal knowledge protection methods are incorporated into daily business functions and services. For example, while working with multiple client's participant makes sure not to share information within client. Files containing confidential and sensitive information are password protected, passwords are not shared via emails rather texts or direct voice calls. Locked documents are kept at two different places, participants laptop and drop box for backups.

Ques 10: Which of the KP strategies are used to protect Tacit knowledge?

Ans: No confidential information shared with contractor. Contractor prints reports for clients which might contain sensitive information so all that is maintained by maintaining trustworthy relationships. And contractor is a trusted friend.

Ques 11: Which of the KP strategies are used to protect Explicit Knowledge?

Ans: Explicit knowledge no sharing of documents. Documents are shared with nominated parties and clients. And all documents are password protected and passwords are shared with text messages.

Ques 12: What kind of protection methods are considered as important?

Ans: Informal methods are enough at the stage, size of the business matters. Formal methods may be required in future but at this stage not really felt the need.

Ques 13: Is there a relationship between structural characteristics and implementation of KP strategies?

Ans: Size of the business effects implementation of KP strategies. Sometimes participant works as third party, so even he doesn't know the name of the client which maintains privacy. A small business example was provided by the client that a small restaurant developed a design for a noodle box whose patent was sold for millions of dollars. He was trying to shed light on the significance of KP.

Ques 14: Whether the type of service provided by the company effects the implementation of knowledge protection strategies?

Ans: Every business should consider KP, because companies work with clients so KP is important to retain your customers. Participant gave an example of a guy named Gordon Ramsay who use to work at a restaurant as a chef and then he opened his own restaurant. And to expand his business he stole the names of clients from his old restaurants booking register sitting on the reception table. He called all the clients to have a meal at his restaurant and built his customer base. And the participant said that even a booking register containing name and phone number of an employee is sensitive in this case and it should have been protected. Gordon Ramsay was later sued by old restaurant for stealing their client information.

Ques 15: What is the effect of market competition on implementation of KP strategies?

Ans: KP helps in achieving competitive advantage. Specially in Compliance business people are willing to pay big amounts of money to develop strategies. Even though information is publicly available what still hard to decide where to get that information. Laws are so broad that it not possible to define strategies just based on law. We need someone specific to look after such matters and develop specific strategies.

Ques 15: Has the participant ever used information gathered from one client for another?

Ans: Participant agreed that he does learn techniques from one client which he has used for other clients. But that did not include any sharing of confidential information about his clients. All he meant is sometimes while working with a specific client he learns some particular skill or technique to have better reports and policies then he uses that skill t develop other clients reports but not steal and share clients data.