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The Role and Contribution of Knowledge and Knowledge Management Practices in Policing. The Case of An Garda Síochána

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The Role and Contribution of Knowledge and Knowledge Management Practices in Policing. The Case of An Garda Síochána.

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Abstract

This research was undertaken in response to knowledge, and particularly knowledge management practice in policing that finds it complex, multifaceted, under researched and lacking in structure and cohesion.

This exploratory research sets out to evaluate the role and contribution of knowledge and knowledge management practices in policing, and using An Garda Síochána, (the Police Service of the Republic of Ireland), as the underlying case exemplar in this work, it will contribute to the extant literature and understanding in the area by use of a study which contains unprecedented insider access to a modern police force, practical findings for knowledge change predicated on structured methodological data analysis, and viable recommendations for knowledge in policing based on these.

Secondary data was initially collected from within and outside An Garda Síochána. This data provided the context and content for the topic list utilised to collect the primary data. Primary data was collected via in-depth interviews, which were conducted with key informants from within the organisation, and one with a key informant from the Irish Parliament. These semi-structured interviews were then analysed in a sequential three-stage data analytical process, using process coding, followed by in-vivo coding, and thematic analysis. Access to the organisation was obtained as a result of rigorous security clearance protocols and granted as the researcher is also serving police officer.

Originality and Value

This work emanates from a unique and detailed view of policing knowledge from an insider perspective. It will facilitate future research to be carried out on policing from both an antecedent and subsequent perspective, as it is situated in the transformation area of policing knowledge and the perspective of policing personnel. By positing distinct recommendations based on rigorous qualitative analysis, this work has been methodologically positioned to frame future research on policing knowledge, which will enable more pragmatic use of knowledge and knowledge resources in policing.

Findings

On Organisational Governance and Policy;

Oversight and governance processes in the organisation appear to adversely affect the organisations ability (from a knowledge management and practice perspective), to utilise knowledge (both tacit and explicit), to carry out its core functions of crime prevention and detection, and also impacts its ability to promote societal harmony.

On Organisational Management;

It would appear that there are few standardised knowledge practices in the organisation which can be leveraged across its divisions, sections, and directorates. This makes the identification, prioritisation, and importance of existing and potential knowledge difficult to utilise in practice.

Knowledge dissemination (in the absence of rigorous and well managed knowledge management practices) tends to be unstructured rather than structured and codified, which could potentially lead to sub-optimal knowledge practices and processes.

There appears to be little or no formal knowledge measurement practices in place in the organisation, consequently, it is difficult to discern the value added by rigorous knowledge collation, analysis and timely dissemination.

There needs to be more integration of knowledge management and practice between civilian and police staff, so that the sharing and reciprocity of knowledge between each can be optimised.

On Front Line Policing;

From a leadership perspective, this research finds that front line police officers in the exemplar case require more timely and relevant knowledge in many of the situations they encounter.

From a front-line perspective, it would appear that there are no formal knowledge management practice policies in place to identify, capture, harvest, or capitalise on the knowledge that individuals possess, either from education and training, or from relevant experience in a policing environment. Relevant knowledge, therefore, tends to be tacit rather than codified.

Finally, it was found that technology was regarded throughout the organisation as a key enabler of knowledge, but that timely and relevant training is required to bring this to fruition. Significant investment in proven technology and training is vital, in order to implement knowledge management "best and next practice".

Research Implications / Limitations

Knowledge is a core organisational asset and must be overtly recognised and signposted as such. The appointment of a Chief Knowledge Officer (reporting to the Chief of Police) will facilitate knowledge creation, knowledge management, and knowledge "best practice and process". Ideally, this person should have front line policing experience at some point in their career.

Technology (ICT) must be fully leveraged throughout the organisation in order to provide front-line staff with timely and appropriate knowledge and insight. Access to this technology must be coupled with access to domain experts within the organisation at the appropriate time. This will empower them to perform key boundary spanning roles that will enable effective interaction in a professional, consistent, and confident way with key stakeholders across society – on a daily basis.

Front line training and education must include greater emphasis on interpersonal proficiency and formal knowledge acquisition. This includes requisite skills education and training, and the practical inculcation of knowledge management and practice throughout the organisation, at all levels. This has major implications for the recruitment and retention of new recruits and will require recruitment practices which frontload psychological and absorptive capacity testing to identify "knowledge receptive" recruits – particularly those chosen and identified for specialist roles.

In policing, the rule of law is upheld and enforced by organisations whose primary objective is societal harmony. It is essential that this consensual relationship is underpinned (on the policing side) by knowledge and insight, adequately resourced. A resource unit is therefore suggested as an essential knowledge gathering enterprise for both primary and secondary data. The remit of this unit (reporting directly to the Chief Knowledge Officer), will be to underpin knowledge management policy and practice with key strategic and operational data, and to ensure that knowledge has a rigorous academic and evidenced based grounding. This unit should also be responsible for the evaluation of knowledge management and practice in the organisation, and this evaluation methodology should be viewed as a positive process, which will help improve knowledge management policy and practice.

This qualitative research utilises An Garda Síochána as a case study. Further study will be undertaken to assess each of the recommendations utilising the organisations modernisation and renewal programme, in consultation with the research unit of the organisation. This will also allow for validation of the recommendations and assessment of their effectiveness.

Practical Implications

The appointment of (CKO) at board level will serve to inculcate knowledge practice and knowledge initiatives throughout the organisation. This will be facilitated by the introduction of an analysis unit to increase the dissemination of evidential based knowledge practice. The introduction of cohesive technological practices including practical steps to merge technology more effectively with front line policing to make knowledge more available will make more effective use of knowledge for front line policing. More specific training paradigms aimed at specialist outcomes, for example, front line policing, detective duties, scenes of crime, etc, will enable more ingrained knowledge to be disseminated during the training process, resulting in more confident and knowledge based police personnel.

Social Implications

As policing conducts its business within a framework of complex mandates, societal acceptance of policing depends on confidence and legitimacy; this will be enhanced through more effective dissemination of knowledge to policing personnel. Symbiotically the confidence displayed by front line police personnel will engender confidence in the public which may result in more information being shared re crime and criminal behaviour.

Acknowledgements

There are a multitude of people that deserve my heartfelt thanks and appreciation and without whom this journey would have been impossible.

First, I have been privileged to have in my life four people who I would consider to be of the highest calibre, who have been instrumental in helping me to complete this journey, and more importantly, have helped make me the person that I am today. There is no specific order to this list except for one person; my father, the late Henry George Mc Evoy.

Dad, I miss you every day. I will always be grateful to you for your advice, love, and guidance and I hope I made you proud.

My original supervisor and friend, the late Professor Amr Arisha, whose support, friendship and guidance will always be with me.

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And most importantly of all, to my amazing wife Colma. Thank you for all your love and support. I could not have done this without you, and you inspire me all the time. All my love, always.

This work is dedicated to the late Henry George Mc Evoy.

"Dad, I'll be in touch."

Paul J. Mc Evoy. 2020.

Declaration

I certify that this thesis which I now submit for examination for the award of Doctor of Philosophy (Ph.D.), is entirely my own work and has not been taken from the work of others, save and to the extent that such work has been cited and acknowledged within the text of my work.

This thesis was prepared according to the regulations for graduate study by research of the Technological University, Dublin and has not been submitted in whole or in part for another award in any other third level institution.

The work in this thesis conforms to the principles and requirements of the TU Dublin's guidelines for ethics in research. TU Dublin has permission to keep, lend or copy this thesis in whole or in part, on condition that any such use of the material of the thesis be duly acknowledged.

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Abbreviations

KM	*Knowledge Management*
IC	*Intellectual Capital*
KMS	*Knowledge Management Systems*
AGS	*An Garda Síochána*
ANPR	*Automatic Number Plate Recognition*
COP	*Communities of Practice*
PULSE	*Police Using Leading Systems Effectively*
HRM	*Human Resource Management*
HR	*Human Resources*
ICT	*Information Communication Technology*
GDPR	*General Data Protection Regulations*
NYC	*New York City*
NYPD	*New York Police Department*
LAPD	*Los Angeles Police Department*
CKO	*Chief Knowledge Officer*

Chapter 1 Introduction

The dynamics of public sector organisations are complex. They are historically insular with specific and defined networks which typically consist of formal hierarchies and mechanistic sub structures. Public sector organisations today also exhibit a mix of tightly controlled bureaucratic accountability and service-oriented paradigms. These, coupled with increased pressure to account for its actions from multiple sources, make the public sector one of the most dynamic and challenging sectors in today's business environment.

Law enforcement agencies are typical examples of these public sector entities, in that they exist to provide a service, and yet have to yield to legislative, societal, and governmental mandate. This accountability is reflective of the general public sector which typically exhibits greater environments of control than the private sector but has also greater external influence involving government, exchequer and societal accountability. This complex mix can make knowledge identification, transfer, dissemination and assimilation difficult and can result in complicated and protracted decision making processes.

However, there is a lack of specific knowledge management research in particular public sector areas such as the emergency services and the military, where, historically, bureaucracy, government policy, and security have prevented access by researchers seeking to understand more about how the public sector manages knowledge.

This exploratory research sets out to evaluate the role and contribution of knowledge and knowledge management practices in policing, and using An Garda Síochána, (the Police Service of the Republic of Ireland) as the underlying case exemplar in this work, it will contribute to the extant literature and understanding in the area by use of a study which contains unprecedented insider access to a modern police force, practical findings for knowledge change predicated on structured methodological data analysis, and viable recommendations for knowledge in policing based on these.

1.1 The Context for this Research

The literature has suggested that there is a dearth of evidence on public sector knowledge management, a view echoed by Garlatti and Dumay (2015), who have observed that it is an area research scholars tend to stay away from as it is historically difficult to gain access to insular, hierarchical bodies such as police, army and government departments.

This research attempts to fill that gap and consists of a detailed case study in which a public sector entity (An Garda Síochána, the Irish Police Force) is the subject. The resultant data gathered and analysed will imbue the findings and the knowledge recommendations presented with a rigorous foundation grounded in the data and the literature.

Allowing unprecedented access to the security processes, procedures and hierarchies of the Irish police force has yielded data that has not yet been provided or available. This has given this research a unique context, and the subsequent analysis which has been undertaken has uncovered specific knowledge gaps that have not been available previously.

Massaro et.al have suggested that there is a "need for more performative and or interventionist research into public sector knowledge management" (Massaro *et al.*, 2015) and recommended that academics get their "hands dirty" in relation to the investigation of knowledge management solutions, specifically in relation to the unique set of characteristics that the public sector exhibits. This in itself is an entreatment to researchers to look at this area of knowledge in order to bring this area under scrutiny for present and future research work.

1.2 Research Question and Objectives

This study will ultimately aim to produce a body of research on public sector knowledge management through the following research question and objectives. Therefore, the main research question of this work is the following;

> **What is the role and contribution of knowledge and knowledge management practices in policing. The case of An Garda Síochána.**

This question is then broken down into the following research objectives;

Research Objective 1 - **To critically evaluate the role of knowledge and knowledge management in policing.**

Research Objective 2 - **To assess the contribution of knowledge and knowledge management practices in policing**

Research Objective 3 – **To make recommendations to police management in relation to improvements in existing knowledge and knowledge management practices, and to offer guidance to police forces) in relation to knowledge and knowledge management practices.**

Research Objective 1

In order to posit something new, cognisance must first be taken of the present. It is essential that the current state of knowledge in a given field be appraised, analysed, and noted in order that a contribution can be made (Gill and Johnson, 2010). This leads the researcher to refine the scope of the research and make objective assertions based on systemic analysis and refined requirement. The first stage in this process will be to undertake a comprehensive literature review with an aim to linearly describe the origin, progression, and current status of knowledge, knowledge management, knowledge measurement, and knowledge management assessment frameworks.

Public sector knowledge management literature will then be analysed in order to assess the nuances of its knowledge processes and compare it to the private sector. As law enforcement is a typical example of a public sector entity, the context for public sector knowledge and knowledge management equally applies to it (Davies and Thomas, 2003). The literature review will primarily include research articles published in peer-reviewed academic journals as well as conference articles and influential books in the knowledge management field. The objective of the literature review will be to identify areas of public sector knowledge management that have been under-researched and determine areas that may need to be examined further.

Research Objective 2

To assess the contribution of knowledge and knowledge management practices in policing

The differences between public and private sector have resulted in a specific stream of research, initiated by Rainey, Backoff and Levine, (1976). This research discusses the fact that particular *demands* place unique pressures on each and result in alternative practices that each have implemented (Blumenthal, 1983; Perry and Rainey, 1988). For example, public sector organisations (including policing) are viewed as being limited in their strategic making autonomy due to governmental restriction, legislative disclosure obligations, and disparate hierarchies, consisting of a mix of political and business appointees and exchequer constraints (Nutt, 2006).

The private sector on the other hand is defined by the effective utilisation of knowledge which is used to assist in the leveraging of competitive advantage (Denner and Blackman, 2013). These differences will be elaborated further in the literature review chapter; however, the idea behind this section of the research is to clearly show the specifics of the public sector and how it manages knowledge. Law enforcement has been touted as being unique when it comes to public sector knowledge, as it has a complex mandate between specific knowledge required for investigative practice and process while at the same time being influenced by government mandate and responsible for the safety of the public (Lindsay, Cooke and Jackson, 2009), and its knowledge requirements are equally diverse and complex. Knowledge, therefore, as a value proposition in the public sector will also be discussed and more specifically analysed in relation to policing.

Research Objective 3

To make recommendations to police management in relation to improvements in existing knowledge and knowledge management practices, and to offer guidance to police forces in relation to knowledge and knowledge management practices.

In order to meet this objective, a comprehensive amount of data will be gathered and analysed. This will be based on sound methodological processes and unprecedented access to a policing organisation via a detailed case study. This will imbue this work with validity and rigour and the results will be presented as a result of this detailed analysis. Having presented the literature in relation to the foundation for knowledge, knowledge management, and knowledge management practice, it is clear that public sector security areas have been relatively under-researched. Therefore, in order to make appropriate recommendations regarding knowledge and knowledge management, this research will assess the current knowledge management practices in An Garda Síochána against this backdrop.

Sharing knowledge is critical for any police force and any police employee (Lindsay, Cooke and Jackson, 2009; Griffiths *et al.*, 2016), and this in itself presents a paradox when set against typical public sector attributes of knowledge hoarding and resistance to change (Laihonen and Mäntylä, 2017). In order to make recommendations, therefore, it is crucial that this research adopts a holistic view of public sector knowledge and imbues any recommendations with an awareness of public sector nuances and idiosyncrasies and the specific types of knowledge that may be relevant to it.

1.3 Public Sector Law Enforcement

Research conducted into the public sector has led it to being described as bureaucratic, hierarchical, and accountable to multiple sectors. For example, accountability or representation is one of the key attributes of the public sector, and a topic that is seen as crucial to its existence (Perry and Rainey, 1988). The public sectors insular stance which has been documented as being centralised, rule oriented, and overly bureaucratic, as well as focused and self-protecting (Hughes, 2003), has informed policy determination which may symbiotically contribute to this insularity, as it is generally produced only for public sector implementation (Mercer *et al.*, 2005a). These and other attributes have been documented in the literature and serve to underpin the unique stance of the public sector and highlight the differences between it and the private sector.

Against this backdrop, law enforcement agencies can struggle with the sheer amount of justification needed to ensure that all decisions made are based in legislative interpretation and correct intervention. This is also reflected in police reform, which has proven very difficult in the past, particularly in developed counties such as the United Kingdom (Davies and Thomas, 2003). However, to offer any suggestions in relation to knowledge solutions with regard to law enforcement requires two levels of awareness. Number one is the ability to recognise that overall public sector specifics manifest clearly in law enforcement and must be looked at as a subset of overall public sector performance and initiatives (Fleming, 2008). Secondly, any solutions or suggestions offered have to be based on an awareness of the complexity of law enforcement and the fact that knowledge by itself, will not solve crime; however, it will provide an opportunity to decrease the level of misinformation, miscommunication and increase the levels of information sharing vital to, amongst other areas, investigative practice (Seba, Rowley and Delbridge, 2012).

1.4 Thesis Structure

Chapter One

Introduction

Chapter one will introduce the project, the research objectives and research questions, and the rationale for same. It will also outline the structure of the thesis.

Chapter Two

Literature Review

Chapter two will present a systematic literature review of the knowledge management field and review the salient literature on knowledge, knowledge management, knowledge management assessment frameworks and public sector knowledge management. Public sector knowledge management attributes will also be presented and analysed.

Chapter Three

An Garda Síochána

Chapter three will discuss the history of the Irish Police Force, An Garda Síochána, and its place in Irish Society. Comparisons will be drawn from other police forces to illustrate context. The complexity of police knowledge and police knowledge management will also be discussed. The hierarchy of the organisation will also be detailed and its varied and complex remit will be illustrated.

Chapter Four

Methodology

Chapter three will describe the research methodology used to underpin this study. A theoretical research design will be put forward based on the epistemological stance of this work. The research design will be discussed in the context of the public sector and its aims, methods and techniques will be presented as they apply to the research. The rationale for a case study will be discussed and the advantages presented.

Chapter Five

Data Analysis

The data will be presented in this chapter and the methodological approach used to analyse it will be discussed. The results of a qualitative exploratory case study utilising in-depth semi structured interviews will be presented.

Chapter Six

Conclusions and Recommendations

This chapter summarises the main findings and contributions of this project along with its implications for both researchers and practitioners. Limitations of the research are also acknowledged, and avenues for future research are suggested.

Chapter 2: Literature Review

*Please note; sections of this chapter have been presented at the tenth International Forum on Knowledge Asset Dynamics in Bari, Italy, in 2015, and the seventeenth European Conference on Knowledge Management in Ulster University in 2016. Parts of this work have also been published in the Electronic Journal of Knowledge Management Volume 15, Issue 1, May 2017, and Knowledge Management Research and Practice Volume 17, 2019, issue 1.

2.1 Chapter Structure

This chapter will commence with a description of the key drivers behind this research. However, in order to underpin the work with academic rigour, it is imperative that in a systematic literature review, the foundations of the subject matter at hand are illustrated. For example, Edge suggests that "within the public sector, knowledge management is a powerful enabler in the current drive for increased efficiency in all areas" (Massaro *et al.*, 2015). However, this can only be contextualised as part of a knowledge process that begins with a description of knowledge and moves forward from that to describe it in the proper contexts and applicability, ultimately in this case, to the public sector.

Thus, part one of this chapter begins with a methodological description of the scope of public sector knowledge management research conducted for this work. It will then examine the history of the concepts of knowledge and the main approaches and definitions of it. The chapter will then move on to the concept of knowledge management before discussing both the public and private sector dimensions to the subject.

The key differences between public and private sector knowledge management will then be presented. The chapter will then discuss public sector knowledge management classifications, including knowledge measurement practices and public sector dynamics. Knowledge

management in law enforcement will then be discussed and the chapter will conclude by illustrating the key findings from the literature.

With regard to public sector knowledge management, an initial research plan was outlined to determine the research scope and the boundaries of the literature review. Criteria for inclusion were peer-reviewed journal and conference articles retrieved from academic journals and published during the period of 2000 to 2020. Non-academic research and publications in other languages than English were not included. Database searches used the general keywords of "knowledge management" and "public sector" simultaneously. Research articles were analysed thematically with the aim of classifying the literature into clusters. An inductive approach was used to classify articles and was not based on a predefined classification (Crilly, Jashapara and Ferlie, 2010). As the review iteratively progressed, several literature sub-domains became evident and were classified under a certain category according to their content and predominant theme. The objective was to elicit trends in publications and develop a categorisation through which current public sector knowledge management literature could be envisaged (EJKM, May 2017).

As a complete review of all public sector knowledge management literature would be virtually impossible, the concept of theoretical saturation (Glaser and Strauss, 1967), was observed during the review process. This suggests that when no further pertinent data can be adduced to support a hypothesis or theory, the only remaining option is to look further afield. This is particularly true of knowledge management research, which can be found in over twenty six academic journals not ostensibly related to the subject (Serenko and Bontis, 2013), and the ubiquitous nature of knowledge management which traverses many organisational landscapes (Kalling, 2003a).

2.2 Chapter Scope

In total, this research has reviewed over 500 research articles thus far, the majority of which have been published in peer reviewed journals. This work was presented at the European Conference on Knowledge Management held in Belfast (Northern Ireland) in 2016. It was further developed and published in the Electronic Journal of Knowledge Management (Volume 15, Issue 1, May 2017). Given the limitations of KM research in the public sector as compared to the private sector (Amayah 2013a), it was felt that relevant articles from journals not directly related to public sector KM should be included in order to take into account the heterogeneous range and nature of KM (Ragab and Amr Arisha, 2013a), and the fact that there is a lack of specialised literature in the public sector KM field (Massaro *et al.*, 2015).

This work has also taken into account the grey literature in the field and includes specific references to reports such as the Police Exchange Report 2018, data from the World Data Bank, the Conroy Commission Report on Garda training and recruitment, and data from various policing information portals, including proprietary websites. This has been done in order to present a holistic picture of the literature in relation to policing and give an overview of strategy and strategic imperatives where necessary.

 While law enforcement knowledge management is relatively under-researched, this work has drawn on previous research from Gottshalk, Seba, Rowley and Fleming to illustrate the specific pressures on law enforcement agencies in relation to knowledge. This has been done in order to illustrate the salient issues in relation to knowledge management in policing and provide detail in relation knowledge complexity and inculcation in law enforcement.

2.3 Research Figures

Perhaps unsurprisingly, over one hundred articles describe knowledge sharing as a predominant theme of public sector knowledge management study. Knowledge sharing has been researched in the context of worker communication (Gorry, 2008), Information Technology (Villasana, 2012), academia, (Messeni Petruzzelli, 2008; Fullwood, Rowley and Delbridge, 2013), health (Bate and Robert, 2003a), the emergency services (Seba, Rowley and Delbridge, 2012), and knowledge sharing networks (Willem and Buelens, 2007; Fauzi *et al.*, 2019). Fifty five articles since 2000 have mentioned reform in the public sector, and these range from reform through to increases in knowledge sharing (Celino and Concilio, 2006), to awareness of tacit knowledge as a precursor to learning and successful reform (Salleh *et al.*, 2013), to educational reform (Kakabadse, Kouzmin and Kakabadse, 2001), and reform initiatives suggested as a result of direct comparison to the private sector (Chawla and Joshi, 2010a).

Research into public sector knowledge management has also been conducted in the areas of communities of practice (Jain and Jeppesen, 2013), government initiatives (Cegarra-Navarro *et al.*, 2013), environmental risk (Mercer *et al.*, 2005b), technology (Syed-Ikhsan and Rowland, 2004; Shukla and Srinivasan, 2006), governance, (Blackman and Kennedy, 2009), and government initiatives (Cegarra-Navarro *et al.*, 2013). To define the areas under consideration more specifically, there is relatively little research into public sector emergency areas such as police and military, with approximately thirty research articles discovered in this work to date. This would indicate clear scope to investigate knowledge in the emergency services, moreover, with regard to policing, engage with areas of knowledge such as innovation, empowerment, and critical thinking (Dean, Fahsing and Gottschalk, 2006).

2.4 Knowledge Scope and Context

2.4.1 Introduction

In today's business environment, knowledge has been recognised as an increasingly viable organisational resource (Randeree, 2006). There has been an exponential increase in its popularity as a topic of interest to both the business and research communities over the past decade (Ragab & Arisha, 2013a). Knowledge has been viewed as a commodity, (Abou-Zeid, 2002), a central economic support (Anantatmula, 2007), and a key organisational asset (Agarwal and Islam, 2015). It has also been linked to organisational advancement (Vittal S. Anantatmula and Kanungo, 2010). Research has also suggested that knowledge is the precursor of the relationship between organisations and their corporate performance (Yu, Kim and Kim, 2007).

Knowledge as a specific marketable asset has been conceptualised in terms of patents, copyrights and intellectual property (Zhu, 2004). It has also been credited with changing how organisations are perceived (Lee and Ahn, 2005; Shulman, 2005) and has been the catalyst that has evolved management decision making from strategic planning to strategic thinking (Spender and Scherer, 2007a). It is no longer regarded as a luxury however, but an essential ingredient of competitive advantage (Abou-Zeid, 2002). This fundamental paradigmatic shift is occurring in all organisational landscapes where knowledge has now evolved to the point where it is at the forefront of organisational strategy (Oluikpe, 2012a). As organisations progress from the classical or industrial model to a knowledge-based one, knowledge is being touted as the agent for this transformation as much as the architect of it (Ramachandran, Chong and Ismail, 2009).

2.4.2 Knowledge Development

Knowledge as a topic has been explored since the times of the Greek Philosophers, who attempted to articulate the phenomenon in order to account for human nature and thus inform human experience (Long, 1999). The rise of knowledge as a subject stemmed from this view and gave credence to a phenomenological view of the world where thinking tactilely and figuratively was seen as natural progression (Baird, 2004). The subject of knowledge has been detailed throughout history and has spurred its own branch of philosophy, entitled *epistemology*. This has its origins in science and the measurement of mathematics but has evolved as scholars debate the vicissitudes of changing philosophical stances on the subject (Quine, 1971).

One of the many complexities of knowledge however, comes not only from the myriad ways in which it can be leveraged, but the ambiguity that can surround its role and context (Spender, 2005). This ambiguity has driven knowledge principally into the ICT domain where it has historically been confused with "information" (Samiotis, Stojanovic, & Ntioudis). More specifically, the concept of knowledge has myriad connotations that may or may not be of organisational benefit, such as the role and place of knowledge sharing (Amayah, 2013b), the role of knowledge in assessing organisational success and performance (Alhamoudi, 2001) and its relevance in shaping organisational culture (Lam, 2005). But to leverage knowledge effectively, it must be understood, and the ability to "leverage" knowledge is seen by some as the most potent force in an organisational arsenal, mostly because it's increasing importance is extremely difficult to contextualise (Baskerville and Dulipovici, 2006; Rahe, 2009).

In order to look at knowledge as a resource, it requires organisation and control, which has to be undertaken if it is treated as a discernible commodity (Sørensen and Kakihara, 2002). For example, it has been shown that knowledge sharing has a bearing on performance in all organisational sectors, (Amayah, 2013a). Intellectual capital (IC) is a fundamental construct of organisational performance and arises as a result of the diffusion of knowledge throughout organisations (Johnson, 2007), and the externalisation of tacit knowledge to explicit (Haldin-Herrgard, 2000), are all attempts to bring clarity to the complexity and understanding of the topic.

2.5 Formalising Knowledge

Thus, attempts to formalise knowledge and use it as a resource have resulted almost in its declassification, and the definition by Davenport and Prusak (1998) of knowledge as *"fluid"* gives an indication of the difficulty in articulating it. The nature of knowledge is multifaceted and fluxional, which therefore makes its management a challenging endeavour (Erwee, Skadiang and Roxas, 2012). Moreover, sole focus on codifying knowledge can bring state of information which may undermine its relevance and potentially reduce its effectiveness (Samiotis et al). Knowledge also has a part to play in assessing organisational success and performance (Alhamoudi, 2001) and is relevant shaping organisational culture (Lam, 2005).

2.5.1 Knowledge, Data and Information

To situate knowledge, it must be viewed in context. To this day, there is confusion over what actually constitutes knowledge, and as a result, how to measure its degree of relevance (Firestone, 2008). There are, however, clear delineations in relation to knowledge such as the trichotomous distinction between data, information, and knowledge (Grundstein, 2013). It has been contended that they are inextricably linked, however, data and information both act as

precursors to knowledge (Rowley, 2007), a view shared by Prusak, who states that "*data is a set of discrete, objective facts about events endowed with relevance and purpose*". Information is "*data in motion*", and knowledge adds the "*consequences and reasoning*" to information, which suggests a flow from one state to the next.

Davenport and Prusak suggest that linkages between knowledge, data, and information happen as a result of a series of "transformational processes". They have authored perhaps the most well-known definition of knowledge in their seminal work "Working Knowledge, How Organisations Manage What They Know." (B. T. H. Davenport, Prusak, & Webber) , by defining knowledge as a "*fluid mix of framed experience, values, contextual information and expert insight that provides a framework for evaluating and incorporating new experiences and information.*" This again describes the nature of knowledge as a "flow" and the catalyst that underpins the functionality of data and information (Ackoff, 1989). Rowley suggests that knowledge is a "combination of data and information", and they act as contributions to it, also suggesting a flow of these attributes into knowledge as a specific endpoint (Rowley, 2007).

2.5.2 Tacit and Explicit Knowledge

The notion of *tacit knowledge* first proposed by (Polanyi, 1966), gave rise to the most famous dichotomy in knowledge research, that of tacit and explicit knowledge, and spawned the subsequent creational model on dynamic knowledge synergy (Nonaka and Takeuchi 1994, 1996). Tacit knowledge is a subjective epistemological interpretation of knowledge that lies in an individual's ability to interpret and contextualise it (Tuomi, 1999). Explicit knowledge is codified, articulated knowledge, stored in documents, books or digitised and stored electronically (Rowley, 2007).

2.5.3 Knowledge Comparisons

There is also an explanation of knowledge that stands between tacit and explicit, and that is implicit knowledge, viewed as practical knowledge, or "knowing in action" (Rix and Lièvre, 2008). This is essentially the conversion of tacit knowledge (or part of it) to explicit. It is suggested that only some knowledge is suitable for this transformation (Frappaolo, 2008), but for implicit knowledge to be articulated, it is necessary to be manifest in a specific situation or circumstance (Yanow and Tsoukas, 2007). The tacit & explicit dichotomy is one of many in the literature. Heisig (2009) and Blumentritt et.al (199), for example, describe further dichotomies and taxonomies of knowledge. These are detailed in appendix 5.

Despite the seemingly endless connotations and articulations of knowledge, it is generally thought of as emanating from or residing in the individual. Social Cartesianism espoused by Collins investigates the uniqueness of human ability with regard to externalising knowledge and using it to conform to societal norms (Roberts, 2015). The simple method of demonstration for example, has confounded all attempts to objectify the knowledge contained in the process and make it explicit and thus usable by more than one person (MacKenzie and Spinardi, 1995).

This points to the importance of knowledge flow between the individual and the group or the organisation, although knowledge cannot become explicit, and ultimately "organisational" without first being expressed by the individual (Myers, 1996). Explicit knowledge, however, may be more complicated than just the articulation of the tacit. J.C. Spender has posited that it is entirely possible for explicit knowledge to reside in the individual, and this "objectified" knowledge is subconsciously held by the person and manifest in explicit paradigms such as organisational procedures and processes etc. When this occurs in a social context, it becomes organisational knowledge or intellectual capital (Spender, 1996). This leads to a proposed

pluralist epistemological stance, proposed by Spender, which distinguishes between four potential knowledge types:

Conscious knowledge: Explicit knowledge codified by individuals.

Objectified knowledge: Explicit knowledge shared throughout the organization.

Automatic Knowledge: Tacit knowledge of individuals living their experience or judgments.

Collective knowledge: Group tacit knowledge of collective experience and informal routines created by synergy between individuals.

Within this matrix. knowledge is fluid and created in the interaction between the individual's conscious activity and the firm's explicit knowledge practices (Spender, 1998). Von Hayek (1945) first suggested the difference between knowledge that individuals *have access to* and the situational knowledge or context in which to evaluate it objectively (Hayek, 1945). The concept of organisational knowledge, therefore has its roots in knowledge *about* the organisation (Roberts, 2015), as a *resource* within the organisation (Grant, 1996), and in interactions between the individual and the firm (Spender, 1998).

2.5.4 The "SECI" Model

The process of transforming individual knowledge into collective and organisational knowledge has been expressed in the seminal SECI Model proposed by Nonaka & Takeuchi (Nonaka and Takeuchi, 1995a). This model investigates possible adaptive paradigms of knowledge conversion from tacit to explicit using four conversion possibilities and utilises Polanyi's (1966) tacit & explicit dichotomy for its epistemological foundation (Roberts, 2015). The four conversion processes are:

Socialisation (S) - conversion of tacit knowledge into socially objective knowledge through elements such as bounded rationality and constructivist agentic dialect.

Externalisation (E) - conversion or articulation of tacit knowledge into explicit knowledge, this can occur through codification, articulation and can be used to disseminate contextual knowledge from individuals to groups.

Combination (C) - conversion of disparate types of explicit knowledge through organisational processes such as codification and documentation. This results in the generation of viable organisational knowledge.

Internalisation (I) - conversion of explicit knowledge into tacit knowledge which is distinct from the original.

<div align="right">Adapted from Nonaka and Konno (2005)</div>

Figure 1 The SECI Model
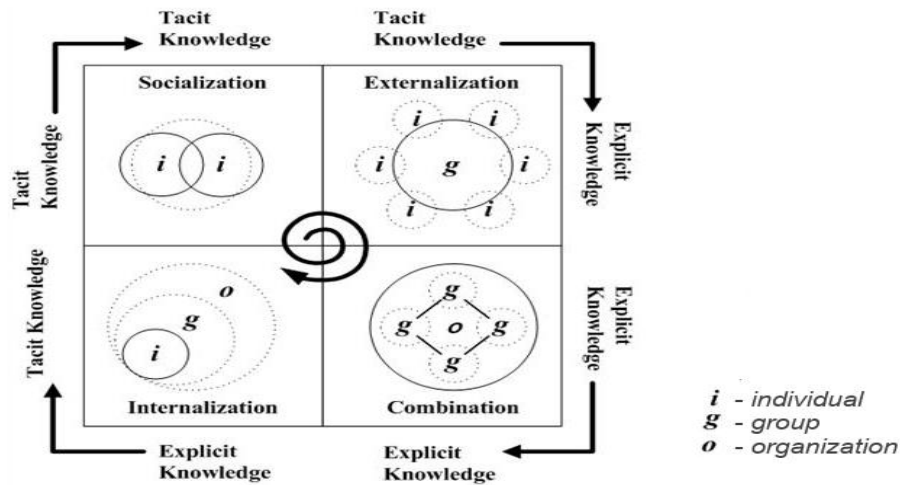
<div align="right">Adopted from Nonaka and Konno (2005)</div>

The "SECI" models detractors include Abdullah, who, for example, suggests that it is too philosophically oriented to be practical (Abdullah and Date, 2009), and Gourlay, who has suggested that the empirical evidence base for the model does not withstand scrutiny (Gourlay, 2006b), more specifically, it has not produced a unified definition of tacit knowledge.

In relation to modes of knowledge conversion proposed by the SECI model, Gourlay has suggested that the subjectivity involved in the example provided by Nonaka (that of baking bread) is in itself subject to scrutiny due to the level of subjectivity that is assumed in the example (Gourlay, 2003). Gourlay has also suggested that Polanyi's concepts of understanding tacit knowledge may not be as robust as they appear (Gourlay, 2006b). This is primarily because of the complexity of tacit knowledge and the requirement to ultimately utilise it as organisational (Ambrosini and Bowman, 2001; Johannessen, Olaisen and Olsen, 2001).

Tacit knowledge is thus described as the source of knowledge (Gourlay, 2006b), and in critiquing the SECI model, Gourlay invokes the multifaceted nature it and suggests that even though it is made explicit, by implication, the original portion of that which is tacit cannot easily be ascertained because it is then incomparable to the original (Gourlay, 2006b).

2.6 Knowledge and the Knower

To distinguish between individual and organisational knowledge, cognisance must first be taken of its potential further dilution, i.e., separating knowledge between *knowing* and *the knower*. There have been two principle historical approaches in the development of dichotomous philosophical knowledge standpoints: an objectivist & positivist approach, and a subjectivist & interpretivist one (Marr, 1992). The objectivist standpoint views knowledge as separate from the knower and attempts to explain who can consider it impassively and not just interpret it. This approach also looks at the dichotomous nature of tacit and explicit knowledge but suggests that explicit, codified knowledge is essential if repeatable processes are to be observed. Some scholars however, suggest that to move beyond dogma is essential if research regarding this dichotomy is to be advanced (Howe, 1988).

A large proportion of KM research however, follows this standpoint, which is reflected in the codification of knowledge through the use of information technology, which is becoming increasingly apparent. However it has also been suggested that knowledge and the management of it is not fundamentally an information technology issue (Cleveland AB, 1999).

Conversely, the interpretive standpoint looks at knowledge as a combination of knowledge and knowing, with the knower becoming actively involved in constructing meaning from the phenomenon under scrutiny. Advocates of this approach view knowledge as a human construct and suggest that it should be embedded in tacit routines and processes, socially manifest and rooted in cultural norms (Hislop, 2013). This standpoint also rejects the dichotomous approach of the objectivist viewpoint, arguing that all knowledge is tacit to a varying degree, and explicit knowledge is merely information. This, by implication, it is

argued, makes tacit knowledge the only relevant type of knowledge, and thus, difficult to manage (York, 1989).

Nonaka, in attempting to situate knowledge between the two views of tacit and explicit, has suggested that by codification externalisation and socialisation processes, knowledge can vacillate between tacit and explicit (York, 1989). This would suggest that it is unlikely therefore, given the complexity of knowledge, for a unified knowledge perspective to emerge from the literature.

This view is supported by Jacquinet *et.al.* who suggest that there is no clear research objective on the tacit dimension of knowledge and knowledge management (Jacquinet *et al.*, 2017), and Venkitachalam, who suggest that the literature suggesting the accumulation of implicit knowledge does not do it justice as it fails to account for all of its intangibility (Venkitachalam and Busch, 2012). Roberts further alludes to the complexity of tacit knowledge by suggesting that the distinction between tacit and explicit knowledge can only be explicated if the degree to which the tacit component can be made explicit is examined (Roberts, 2015). Therefore, it is extremely difficult to understand the inimitable characteristics of tacit knowledge as they are as subjective as the individual's propensity to interpret them (Alwis and Hartmann, 2008). However, it is essential that the tacit component of knowledge is recognised and nurtured in order to allow the interpretation of somatic and ostensive knowledge (Collins, 2001, 2007). The following table presents the salient views on tacit knowledge. This table is presented to illustrate the variety of views on the subject and underline its complexity.

Table 1 Tacit Knowledge Standpoints

Proponent	Year	Publication	Position
Bhardwaj & Monin	(2006)	Journal of Knowledge Management Vol.10 pp. 72-85	Embedded articulation of stories
Gherhardi and Nicolini	(2000)	Organization, Vol. 7 No. 2, pp. 329-48	Exists on a collective social level
Collins HM	(2001)	What is tacit knowledge? In The Practice Turn in Contemporary Theory pp 107–119, Routledge, London	Speaking acceptable phrases
Nonaka, Ikujiro	(1997)	Nonaka; Four Modes of Knowledge Conversion	Tacit knowledge is subjective and experience based knowledge that cannot be expressed in words.
Visvalingam & Singh	(2011)	Journal of Knowledge Management Vol. 15 No 3 pp.462-477	Unarticulable and intuitive and is part of an individual's cognitive thought and perception.
Venkitachalam, and Busch.	(2012)	Journal of Knowledge Management Vol.16 No 2 pp 357-372	It is clearly contextual
Sternberg and Hedlund	(2002)	Human Performance, Vol. 15 No 1/2, pp. 143-60.	Tacit knowledge is procedural knowledge of relevance to daily life
Gourlay	(2006)	KMRP 2006 pp 60-69	Where the knowledge in question could be stated (articulable knowledge). Where there is was evidence of action or behaviour of which the actors cannot give an account

Conclusion

This section has examined knowledge in the context of its scope and development and introduced some of its nuances. Whilst it impossible to discuss every aspect of knowledge within the scope of this work, the salient aspects are presented in order to present the background, range, and context of the subject and scope of the literature in relation to it. The following section of the chapter will examine the concept of knowledge management and the various processes and procedures used in disseminating knowledge.

2.7 Knowledge Flow

The dichotomy between tacit and explicit forms of knowledge has led researchers to discuss its intra-organisational dynamics, and as a result of this, the real practicality of sharing knowledge (Grippa, 2009). As an asset, knowledge can either be codified or reside within individuals in its tacit form. As an organisation evolves, knowledge flows asynchronously between the individual and the organisation, and between tacit and explicit forms (Ragab and Arisha, 2016). Knowledge flows also have the ability to influence the creation of "knowledge stocks" as knowledge accumulates in certain parts of the organisation (Bontis, 1999). Knowledge also flows primarily as a consequence of knowledge sharing through formal and informal social structures, and this occurs through initiatives and practices such as social networks, intranets, and communities of practice (Fong and Kwok, 2009).

For example, Grippa has discussed knowledge flow in universities using social network analysis and found the impact depended on geographic location, background and previous knowledge (Grippa, 2009). The success of knowledge flow in an organisation can be judged by the amount of impediments to it and obstructions in its path. These impediments have been discussed by Szulanski (1996), who has identified four sets of variables that can inhibit knowledge transfer. Table 2 is presented in order to afford the reader a context around the potential of knowledge flow and illustrate its potential barriers (including tacit). These barriers serve to illustrate that knowledge does not flow smoothly in all cases as its conversion from tacit to explicit (to a greater or lesser extent) is inevitable.

Table 2 Knowledge Flow Barriers

Characteristics of the knowledge transferred	Characteristics of the source of knowledge	Characteristics of the recipient of knowledge	Characteristics of the context
Causal ambiguity	Lack of motivation	Lack of motivation	Barren organisational knowledge
Unprovenness	Not perceived as reliable	Lack of absorptive capacity	Arduous relationships
		Lack of retentive capacity	

Adapted from Szulanski (1996)

2.8 Knowledge Management; Scope and Context

2.8.1 Introduction

Having discussed knowledge in the context of its various epistemological distinctions, typologies, and dichotomies in the previous section, it is now perhaps relevant to address the evolutionary perspective of managing this phenomenon. The word "manage" is dated to around the sixteenth century and stems from an Italian verb "*maneggaire*" which means to control or handle (Roberts, 2015). Managing knowledge has become a phenomenon in its own right commensurate with the rise in awareness of knowledge as a substantive resource and precursor to competitive advantage (Voronchuk and Starineca, 2014).

It is also intrinsically linked with the concurrent rise in the ability of Information technology to store and process information (Moffett, McAdam and Parkinson, 2003). Managing knowledge in organisations is a complex task and one that is historically linked to the resource-based view of the firm (RBV) initially proposed by Wernerfelt (1984) and Barney (1991). This gave rise to the knowledge based view of the firm (KBV) proposed by Grant in 1996, which placed knowledge at the forefront of strategic management and was in line with the recognition of knowledge as an intangible asset and pointed to its inimitable characteristics.

One of the most important areas to have evolved from the realisation of knowledge as an organisational asset is the recognition of the importance of organising it (Kianto, Andreeva and Pavlov, 2013; Kianto *et al.*, 2014; Roberts, 2015). In fact, the ability to manage knowledge is seen by some scholars as a prerequisite to organisational existence (Ford and Angermeier, 2004).

The rise of KM has attracted wide interest among researchers, and is reflected in the rapidly growing number of publications in the field. There is, on average, one new KM & IC-centric and one KM & IC relevant journal launched annually (Serenko and Bontis, 2009). Moreover, between 1994 and 2008, there were over 3000 KM authors affiliated to over 1400 institutions (Serenko *et al.*, 2010), while in 2013 there were over 25 KM journals in existence and over 26 that are not involved in KM directly, but publish KM topics (Serenko and Bontis, 2013).

Nevertheless, with the growing recognition of the value of knowledge, a paradox has ensued (Agarwal and Islam, 2015). Because it is such an important organisational resource, the ability to measure and manage the value of knowledge is essential (Bolisani and Oltramari, 2012), but at the same time, the measurement and ultimately, the control of it is inherently difficult given its intangible nature. Accordingly, knowledge cannot be managed in isolation of the *knower*, but rather effective KM entails the effectual management of individual knowledge *holders* (Zhu, 2004). And as with any resource, the fundamental management principles of co-ordinating, controlling, and allocating knowledge resources are paramount to organisational success.

The following table sets out the main definitions of knowledge management as discussed in the literature. This table illustrates the many different definitions of knowledge and affords the reader some context and clarity around the diverse explanations of the topic. This further serves to illustrate the difficulty in articulating the subject and the multifaceted approach that should be taken in order to understand it.

Table 3 Knowledge Management Definitions

Author	Definition
Hedlund (1994)	Knowledge addresses the generation, representation, storage, transfer, transformation, application, embedding, and protecting of organisational knowledge.
Pettrash (1996)	Getting the right knowledge to the right people at the right time so that they can make the best decisions.
O'Dell and Grayson (1998)	Managing the organisation's knowledge by creating, structuring, disseminating and applying it to enhance organisational performance. A conscious strategy of getting the right knowledge to the right people at the right time and helping people share and put information into action in ways that strive to improve organisational performance.
Brooking (1999)	The process by which we manage human centred assets. The function of knowledge management is to guard and grow knowledge and by individuals and where possible transfer the asset into a form could be more readily shared by other employees in the company.
Alavi and Leidner (1999)	A process to acquire, organise, and communicate knowledge of employees or others may be more effective in their work.
Loudon and Loudon (1998)	The process of systematically and actively managing and leveraging the stories of knowledge in an organisation.
Hubert (2000)	A conscious strategy of putting both tacit and explicit knowledge into action by creating context, infrastructure, and learning cycles that enable people to find and use the collective knowledge of the enterprise.
Groff and Jones (2003)	The tools, techniques, and strategies to retain, analyse, organize, improve, and share business expertise.
Jennex (2007)	The practice of selectively applying knowledge from previous experiences of decision making to current and future decision-making activities with the express purpose of improving the organisation's effectiveness.
Firestone (2008)	KM refers to activities aimed at enhancing knowledge processing. These activities are interventions designed to affect how knowledge processing is done.
Stankosky (2011)	Leveraging relevant knowledge assets to improve organisation performance, with emphasis on improving efficiency, effectiveness, and innovation.

(Compiled by Author)

2.8.2 Assumptions in Knowledge Management

 In 1979, Burrell and Morgan set out four "distinct sociological paradigms", which they claimed could be used in order to define an array of social hypotheses (Burrell and Morgan, 1979), and ultimately allow for the analysis or placement of all social theory. This framework has been adapted by Schultze and Stabell to allow for four distinct paradigmatic approaches to be taken to the knowledge management literature. These approaches have their bases in both epistemological and ontological foundations and have (according to Schultze and Stabell), allowed scholars to classify knowledge management approaches through a philosophical lens (Schultze and Stabell, 2004).

Figure 2 details the specifics of the matrix and illustrates what is detailed as key "assumptions" in relation to knowledge management research. These have a basis in propositional and acquaintance knowledge attributes that attempt to situate knowledge in a somatic or ostensive context (Roberts, 2015). However, by their own admission, this is not an attempt to "distil" knowledge management literature into specific quadrants, rather an attempt to look at the theories in deference to the conceptualisation of each type of approach. For example, the framing of each of the four quadrants against a backdrop of the dichotomy between *duality* and *dualism* suggests that there is dialectic grounding between the two and that they should be utilised coherently.

2.8.3 Four views on Knowledge Management

The *neo functionalist* approach suggests that knowledge is a specific commodity that can be utilised and that the dualisms of "knowledge and the knower", "tacit – explicit", and "individual – collective" (Kogut and Zander, 1992; Creation *et al.*, 1997) all belong to the neo functionalist school if they are strictly dichotomous,(Schultze and Stabell, 2004).

The constructivist approach suggests that knowledge is a cumulative entity born of the combination of individual ability, cognitive function, and the transferring of these functions into action (Tsoukas, 1996). This indicates that knowledge cannot be managed easily, but does instead suggest that synchronized action is achievable if individual knowledge is recognised. This approach imbues a lot of research hypotheses with substantiality as the objective is to allow for individual knowledge to not only be recognised, but be leveraged effectively via human capital and succession planning.

The third social paradigmatic approach is the critical discourse approach, which is based on a dialogic dichotomy. This is characterised by opposing stances and the dissonance or tension between them relating to knowledge. On the one hand, knowledge could be interpreted as empowering individual professionalism (Drucker, 2014), and opposing that, the suggestion that knowledge as an enabler of individual assertiveness could be a militant attribute and ultimately become the motivation for individual liberation, which in turn can lead to knowledge loss. Critical social theorists would suggest that knowledge is a tool that can be used to foster socialist ideology and therefore encourage its mal-appropriation.

The dialogic discourse is concerned with viewing knowledge as an antecedent to it potential polarity (Deetz, 1996). Knowledge provides the ability to be powerful, yet it can allow the exercise of its control that cannot occur if it is not knowingly discovered or discoverable (Schultze and Stabell, 2004). This would imply that organisational knowledge is not just an attribute but can potentiate organisational leverage and it has to be managed. Some degree of normative intervention is therefore required in order to capture and disseminate knowledge effectively before it leaves the organisation, ostensibly via empowered individuals who can then become a direct competitive threat to the environment that afforded them the knowledge in the first place. Figure 2 below captures Schultze and Stabell's paradigms to present the reader with a crystallised view of their contentions.

Figure 2 Theoretical and philosophical grouping of knowledge management theories.

	Duality	Dualism
Dissensus	Dialogic Discourse Metaphor of Knowledge: Discipline Role of knowledge in organisations: Deconstruction of totalising knowledge claims. Theories: Post – Structuralist and post-modern.	Critical Discourse Metaphor of Knowledge: Power Role of knowledge in organisational underclass: reformation of social order. Theories: labour process.
Consensus	Constructivist Discourse Metaphor of Knowledge: Mind Role of Knowledge in Organizations: coordinating action, shared context, recovery of integrative values, and generation of understanding. Theories: structuration theories, theories of practice,	Neo-Functionalist Discourse Metaphor of Knowledge: Asset Role of Knowledge in Organizations: prediction, reduction of uncertainty, optimal allocation of resources. Theories: resource-based view of firm, transaction cost theory, contingency theories

(Adapted from Schultze and Stabell, 2004)

2.9 Schools of Knowledge Management

Earl has attempted to compartmentalise knowledge management into specific sections or "schools" which gather together knowledge-based approaches and categorise their relevance. Earl titles the first three schools "Technocratic" (Earl, 2001), and they consist of the systems, cartographic and engineering schools of KM. They are primarily driven by technology and information systems. However, these knowledge management systems utilise information to deliver "support" to individual knowledge workers. The second section of Earl's taxonomy consists of the "Commercial" school of KM, and this looks primarily at the economic benefits of utilising knowledge in a practical context, such as quantifying knowledge assets. The third section is the behavioural section, and this consists of three schools, organisational, spatial and strategic. These are primarily concerned with the social and networking side of knowledge and propose that tacit knowledge and socially exchanged knowledge should be encouraged and maximised.

The Systems School

The "Systems" school of KM is, according to Earl, based on the collective and aimed at capturing organisational knowledge by utilising expert opinion and making best use of it. This process is similar in nature to the "SECI" model in that it has knowledge conversion at its core (Nonaka and Takeuchi, 1995b). Earl further suggests that the knowledge conversion process offers more of a broader benefit to the organisation than information sharing which is at the heart of the majority of management information and executive support systems (Peppard and Ward, 2003). A typical example of what Earl titles the systems school is the Skandia Navigator, where a database of information was built up over a period of years and utilised in order to provide a systemic view of company performance.

However, systemic views of knowledge have been criticised for being narrow in focus and not generalisable, and in order to be effective, knowledge has to be strategic in nature and applicable to the organisation as a whole (Laihonen and Mäntylä, 2018). A further concern is that codified knowledge needs to be validated and verifiable before it can be absorbed into organisational processes (Earl, 2001).

The Cartographic School

This school of KM is primarily concerned with "collecting" knowledge and mapping its efficiency so that it can be used to best effect (Earl, 2001). Examples of this would be intranet and expert information systems that aim to identify key knowledge holders and utilise their skills to best effect. Andreeva discusses "corporate knowledge directories" or company " yellow pages" in the same way, with the aim of improving access to knowledge (Andreeva and Kianto, 2012a). This idea has also been reflected in the literature concerning communities of practice, and KMS (knowledge management systems) that do not point to knowledge per se, rather point to those who hold it and how best to gain access to these key individuals (Begoña Lloria, 2008).

Earl describes an example of the cartographic school as a "people finder" database, the premise of which is the identification of knowledge holders and the ability to "lead" people who need to find information to these holders (Earl, 2001). Knowledge mapping has also been used in the identification of business opportunity (Garnett and Haydon, 2005), while Rosendaal has suggested that the ways in which knowledge is mapped can have a direct bearing on organisational learning (Rosendaal, 2006). There are many other examples of knowledge mapping in the literature, including the provision of knowledge mapping schema in academic libraries (Daneshgar and Parirokh, 2007) and mapping the flow of knowledge through organisational processes and teams (Behrend and Erwee, 2009).

The Process School

The Process school of knowledge management has two distinct ideologies behind it. The first is a drive to ensure that knowledge, once identified, can be successfully inculcated into organisational practice and optimised so that the relevant knowledge is given to the right people at the right time (Earl, 2001). The second is the recognition that knowledge practices need to be specific (in a management context), and this places an onus on the organisation to provide "context specific" information in order to allow management to optimise decision making processes (Earl, 2001). This school of knowledge management presupposes that there is a timely flow of knowledge (via relevant technology systems etc), and is essentially more concerned with the correct application of this knowledge then the processes that emanate from it (Earl, 2001). However, this is not as simple as Earl suggests; for example, Henneberg suggests that different knowledge processes require different capabilities and resources and that markets are not that clearly delineated as to cater for a universal knowledge solution (Swart and Henneberg, 2007).

What is also clear about this school is the fact that it is predicated on information technology, which has a somewhat complex relationship with knowledge management, as it is based on correct codification and relevant interpretation (Gau, 2011), and the complexity increases as the levels of knowledge requirement increase (Swart and Henneberg, 2007).

The Commercial School

The Commercial School of Knowledge Management is primarily focused on the effective utilisation of knowledge assets (Earl, 2001). If knowledge is viewed as a linear process, then managing it, by implication, could be most effective if treated in the same fashion (Cordeiro-Nilsson and Hawamdeh, 2011). This is also imperative if the intention is to exploit knowledge assets to their full potential, as this can lead to sustainable competitive advantage

(Moustaghfir, 2009; Karamat *et al.*, 2019). Davenport has suggested that that managing knowledge is synonymous with recognising the requirement to manage it (Davenport and Prusak, 1998). This is a view echoed in pragmatism, which suggests that the awareness of the practicality of an asset or attribute is justification for its usage (Goldkuhl, 2012).

The commercial school of knowledge management has been reflected most closely in the conglomerate landscape where yielding knowledge as a competitive "weapon" has resulted in effective development of intellectual property rights (Earl, 2001). Companies such as IBM and Texas Instruments have profited greatly from licensing patents and intellectual property (Earl, 2001), and this has resulted in substantial growth of both organisational capability and performance.

The Organisational School

This school of knowledge management suggests that effective pooling of knowledge resources leads to sharing of experience, effective problem solving, and more practical networking (Earl, 2001). Communities of practice, expert knowledge systems and intranets etc, all serve this purpose (Bate and Robert, 2003b; Soekijad, Huis int Veld and Enserink, 2004). Collaboration brings knowledge, knowledge holders and knowledge seekers together (Earl, 2001), and this, in turn can accelerate knowledge flows throughout organisations.

The Spatial School

This school of knowledge management is concerned with optimising the tacit nature of knowledge. Earls suggests the social aspect of knowledge needs to be encouraged, and this in turn will generate tacit knowledge through increased levels of discussion and exchanges of ideas (Earl, 2001). Several high profile organisations have opted for more collaborative workspaces with "breakout" areas, communal meeting rooms, and open plan office space to

encounter and facilitate social behaviour. Organisations such as Google have invested vast sums in spatial workplace design that facilitate and promote idea generation and knowledge sharing.

The Strategic School

Utilising knowledge constructs to their optimum generally occurs after knowledge practices are in place (Earl, 2001), and sustaining growth through effective utilisation of knowledge assets requires a strategic imperative if the advantages are exploited to create sustained value (Coakes and Young, 2007). In order for knowledge practices to create continual value, it is essential that they be articulated, but as Spender points out, how do you make tangible the intangible? The making of implicit or tacit knowledge can depersonalise it and while making it corporate, it is at the behest of the individual to share (J.-C. Spender, 2006a). Spender further contends that as knowledge is "handed over." it becomes increasingly difficult to extract value from it as it requires continual monitoring and management (Spender and Scherer, 2007b).

Summation

There have been many attempts in the literature to present knowledge and knowledge management as frameworks, systems, processes, procedures, and sequential flows. Earl's work in attempting to map knowledge management initiatives into meaningful groups is very valid; however, it does have distinct correlation with the cyclic manufacture, interpretation, inculcation and exploitation of knowledge that is detailed in Nonaka's seminal framework (Nonaka and Takeuchi, 1995a). Thus, it proposes that knowledge is more beneficial when it is delineated, but this particular taxonomy principally allows for *identification* of knowledge possibilities, and from there, it is up to individual organisations to optimise these. The next section of this chapter will discuss some of these knowledge processes in further detail.

2.10 Managing Knowledge Processes and Practices

Introduction

In order to harness the knowledge potential in an organisation, researchers have attempted to map the status of organisational knowledge and contextualise it by proposing models, frameworks, processes, and tools to manage knowledge, and structure its contribution to organisational efficiency. Amongst the many definitions of frameworks is the one by Heisig, who defines it as a "holistic and concise description of the major elements, concepts, and principles of a domain, which aims to explain a domain and define a standardised schema of its core content as a reference for future design implementations" (Heisig, 2009).

 A knowledge management framework can also be described as a framework that explains the world of KM by naming the major KM elements, their relationships and the principles of how these elements interact. It provides the reference for decisions about the implementation and application of KM (Osterloh and Grand, 1995; Weber *et al.*, 2002; Heisig, 2009). Knowledge Management Systems (KMS) are essentially designed to support and formalise knowledge processes which take place within organisational knowledge dynamics. The frameworks discussed thus far are imbued with process but it is important to articulate knowledge processes specifically as they are the key drivers of frameworks, hypotheses, and knowledge solutions.

Authors have proposed different sets of knowledge processes, starting from the creation of knowledge until its utilisation in driving organisational performance. For example, Schiuma and Marr (2001), illustrate knowledge processes through the design of a "cycle" of seven specific activities which are described as the "levers" of KM. This model is entitled "The Knowledge Process Wheel" and is illustrated in figure 3.

Figure 3 The Knowledge Process Wheel
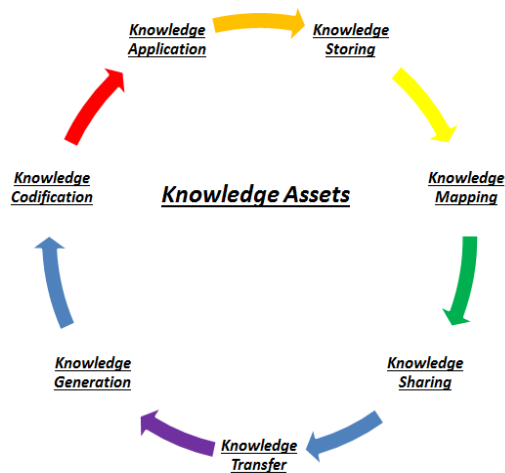
Source: Schiuma and Marr (2001)

This process-based view of knowledge makes a distinction between *knowledge transfer* and *knowledge sharing*, suggesting the former may be more unidirectional while the latter, omni-directional, a view echoed by Jennex (2006) and King (2008). Heisig (2009) has identified 160 KM frameworks with a diverse array of knowledge processes, which he grouped into six "most frequently discussed groups of KM activities", which are detailed in table 4, (Heisig, 2009). This table is presented to illustrate the myriad uses that knowledge as a topic can be utilised for. It serves to distil Heisigs frameworks into a subset of overarching headings which encompass broad directions of KM frameworks

Table 4 KM Activities

KM Activities	Sub-set
Share	Transfer. Distribution. Knowledge Communication. Collaboration. Diffusion. Dissemination. Allocation. Network and Cooperation.
Create	Generation. Development. Innovation. Building and Sustaining. Further Development. Production. Experimentation. Evolution.
Use	Application. Action. Leverage. Reusability. Exploitation. Value Derivation. Capitalisation.
Store	Retention. Capture. Codification. Packaging. Securing. Archiving. Maintenance. Protection. Accumulation
Identify	Organisation and Classification. Structure. Analysis. Reviewing. Locating. Investigation. Discovering. Screening. Mapping.
Acquire	Collecting. Importing. Providing. Sourcing. Gathering.

Adapted from Heisig (2009)

Knowledge processes can also be grouped under the following main activities; (1) Knowledge Creation and Acquisition, (2) Knowledge Storage and Retrieval, (3) Knowledge Transfer and Sharing, and (4) Knowledge Application (Leidner, 2000).

2.11 Knowledge Codification and Personalisation

A seminal distinction of KM frameworks is the one between codification and personalisation (Hansen, 1999). This classification has influenced KMS design and spawned methodological approaches to strategising and processing knowledge on foot of its creation (Denner and Blackman, 2013). The *codification* of knowledge is concerned with its capture, transfer, and storage in electronic format and its availability as an electronic resource by way of computer, database, or cloud application. This tends to favour explicit knowledge and attempts to capture it and make it available for others (Mimnagh, 2002). In contrast, the *personalisation* approach suggests that knowledge is transferred through cooperation and networking (Bosua, 2013), and this is further added to by knowledge sharing and dissemination approaches, which have shown to be conducive to tacit knowledge sharing (Massa and Testa, 2009).

2.12 Organisational Knowledge

As discussed, knowledge management as a phenomenon has been the subject of much scholarly attention and to examine the entire subject in detail would be outside the remit of this research. However, to set the context for public sector knowledge management, it is prudent first to examine organisational knowledge and the propensity for it to be in principal, socially constructed (Roberts, 2015).

Organisational knowledge has been referred to as the accumulation of knowledge in conjunction with the rise of the management of it as a commensurate phenomenon (Roberts, 2015). It has been subject to comparison with Grant's knowledge-based view of the firm (Grant, 1996), and has cumulatively been defined as "the knowledge embedded in the organisation's assets, databases, intellectual property rights, routines, processes, practices,

and norms, as well as in the organisation's members, both as individuals and as communities"
(Grant, 1996; Roberts, 2015).

The well-used phrase "knowledge is power" suggests a deep connection between individualism and collectivism, and looking at individual's in the context of organisational knowledge management, there has historically been a tendency for individuals to "keep" or "hold on" to knowledge which can bestow a sense of proprietariness and control on not just the knowledge held, but the possessor (Peng, 2013). There is an awareness among individuals that to "lose knowledge" can lessen their chances of employment progression, privacy, perhaps leave them with an exposure to legal action, and lessen job security (Damodaran and Olphert, 2000). As knowledge loss is a key factor in all organisations it is essential that its role be understood in order for it to be objectified. Raudeliūnienė has suggested that in the armed forces, for example, it is essential to retain knowledge and examine this against personnel otherwise it could potentially lead to organisational decline (RAUDELIŪNIENĖ, DAVIDAVIČIENĖ and PETRUSEVIČIUS, 2018).

2.12.1 Knowledge Sharing Culture

A knowledge-sharing culture if inculcated into an organisation can assist in knowledge dissemination, and research has indicated that knowledge sharing is generally rewarded in complex ways such as motivation (intrinsic, extrinsic, and hedonic), (Lindenberg, 2001), and opportunities for collaborative practices (Lam and Lambermont-Ford, 2010). Organisational knowledge, once identified as such, has essentially been branded as "learning" (Roberts, 2015).

For this "organisational learning" to take hold and become inculcated into routines and practices, it must be *derived* from the developmental and adaptive foundations of knowledge (Mirvis, 1996). This leads to the concept of "organisational learning" which originally stemmed for work by Cyert and March (1963). They posited that as organisations grow and adapt, they learn by default in order to survive (Roberts, 2015).

2.12.2 The Learning Organisation

In contrast, the idea of "*the learning organisation"* surfaced in the 1980s, with Garratt's seminal work in the field. This concept was popularised by the publication of Peter Senge's "The Fifth Discipline" which contextualised the learning organisation as a place where existential learning took place due to the latitude given to individuals to "think freely" (Senge, 1997). One of the main tenets of Seng's work is the idea of "systems thinking." which is based on a holistic view of a problem. It attempts to understand not just the problem itself but the phenomena surrounding it, such as the correlation between the organisation, the environment, the problem, and the proposed solution (Senge, 1991, 1997).

The concept of the learning organisation has not garnered as much attention in the literature as organisational learning, and this is perhaps due to the fact that the literature referring to it has been relatively limited, possibly due to a slow take up on the concept by North American academics (Easterby-Smith and Lyles, 2011; Roberts, 2015). It is also potentially more difficult to introduce into organisations as it focuses on individual learning, which can be harder to measure than collective organisational learning (Roberts, 2015).

2.12.3 Communities of Practice and Types of Communities of Practice

Communities of practice (COP) have been synonymous with knowledge management since the term was formalised in 1991 by Lave and Wegner. A community of practice is a name given to a process or function that facilitates knowledge sharing by allowing individuals to assess, distribute, and build on knowledge that may be tacit or explicit. In the process of so doing they can develop their own interpretative stance on the knowledge discussed (Klein, Connell and Meyer, 2005).

Wenger et al. (2002) defines communities of practice as "*groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis*" (Wenger, McDermott and Snyder, 2002). Communities of practice are not synonymous with knowledge however, they have been used to pool resources in information system development (Ward, Griffiths and Whitmore, 2002), and were originally intended to promote learning via structured social theories of participation framed by constructivist paradigms (Klein, Connell and Meyer, 2005).

Communities of practice have somewhat of an emergent thematic form insofar as they tend to develop wherever expertise accumulates (Brown and Duguid, 1991). However, paradoxically, they do not exist just because groups are engaged in amalgamated learning environments (Klein, Connell and Meyer, 2005).

What makes communities of practice relevant to knowledge and knowledge management is that nearly all of the activities engaged in by practitioners are related to or evolve from the movement of knowledge. Klein (2005) suggests that there are essentially two types of COP, *knowledge sharing* and *knowledge nurturing.* Knowledge sharing COP, as the name suggests, involve some or all of the members sharing knowledge, whereas knowledge nurturing COP

suggest a repository like structure where the environment is conducive to knowledge creation. Klein contends that this leads to a matrix type structure which allows for a taxonomic breakdown of four types of communities of practice developed from knowledge sharing and knowledge nurturing communities of practice. The table below serves to illustrate the sub-headings which detail the types of COP with their commensurate knowledge foundation. The purpose of this is to illustrate the potential complexity of COP and suggest that a one size fits all COP can be difficult to initiate.

Table 5 Knowledge activities and Communities of Practice

Knowledge Activity		
	Knowledge Sharing Communities of Practice	*Knowledge Nurturing Communities of Practice*
Stratified	**Advanced grades share knowledge with less advanced grades. Knowledge flows down through community.** **Community knowledge fixed and slow to change.**	**Knowledge development experiences sequentially arranged.** **Knowledge development controlled by control of experience.** **Community knowledge changes slowly but develops pluralistically.**
Egalitarian	**All grades share knowledge with each other.** **Knowledge flows up and down through community.** **Community knowledge changes quickly.**	**Knowledge development experiences not sequentially arranged.** **Knowledge development not controlled.** **Community knowledge changes quickly and develops pluralistically.**

Adapted from Klien (2005)

Communities of practice have been placed at the forefront of organisational success with organisations such as Shell Oil and Mc Kinsey and company, relying on the technical expertise and business acumen that accrues from their utilisation (Wenger, McDermott and Snyder, 2002). Wegner further asserts that COP's can offer organisations a link between knowledge and business opportunities, problem solving, and communication.

Spender argues against this position somewhat and suggests that while COP have a role to play in organisational routines or processes, ultimately KM is more concerned with extracting meaning from the information generated from data than just collaborating with the intent of multiplying content (J.-C. Spender, 2006a).

Conclusion

This section has examined the literature in relation to the management of knowledge as an organisational asset. It has also introduced the main schools of thought on the subject and organisational knowledge and the concept of communities of practice, which are an invaluable aid in the facilitation of knowledge sharing (Klein, Connell and Meyer, 2005). The next section of this chapter will discuss the measurement of knowledge, itself a complex subject, and will introduce the predominant ways of classifying and assessing its efficacy.

2.13 Evaluating knowledge assets in organisations

Introduction

Due to the intangible nature of knowledge, perhaps one of the most difficult issues associated with it is the issue of classifying or measuring it accurately. Whilst this research will examine the question of the identification and practical application of knowledge management practices, it is also necessary to take cognisance of the various ways of measuring knowledge. This will be done firstly in an organisational context and then in an individual one, as the knowledge recommendations proposed in this work may be utilised in the Irish Police force. This makes its efficacy potentially subject to measurement, such as a reduction in knowledge loss, improvement in communication, and a reduction in unstructured information silos.

Knowledge measurement is a complex issue, and due to its indefinable nature, it has historically been difficult to achieve (Kankanhalli and Tan, 2005). Some researchers have labelled transactional knowledge as "sticky" and "fluid" (Coakes, Sugden and Bradburn, 2003), and suggest that organisational processes generate this type of knowledge through individuals as they have made their mark on it (Hildreth, Kimble and Wright, 2000). With regard to knowledge being seen as a process or flow, it is often seen initially as an enabler of intellectual capital, which is almost a starting point for knowledge generation. Some research has suggested that intellectual capital is "defined as the sum of all knowledge that organisations utilise for competitive advantage" (Subramaniam and Youndt, 2005).

But it is more often described as an amalgamation of assets such as structural, relational, and human that assist in the derivation of competitive advantage (Schiuma, Lerro and Sanitate, 2008). However, the knowledge that people hold has been the prime driver of intellectual

capital (Gorry and Westbrook, 2012) and a measure of the "stock" of knowledge an organisation holds at any particular time (Radaelli *et al.*, 2011).

2.13.1 Knowledge as a Valuable Enabler

Increased and effective utilisation of knowledge is a generally accepted way to add value to a business, but only if it is augmented with a knowledge-sharing climate (Radaelli *et al.*, 2011). This aids the accumulation of intellectual capital which itself is difficult to measure as it is primarily intangible in nature (Bontis, 1999). This gives managers a two-fold dilemma, that of managing *and* measuring two key organisational assets that are inextricably linked and inherently difficult to measure (Coakes and Bradburn, 2005). There is a view that intangible assets need to be addressed and measured in order to ultimately measure organisational value (Lev, 1997), but these assets need to be "exploitable" (Hussi, 2004), and this is difficult given the lack of clarity around intellectual capital, strategic alignment and the distribution of knowledge assets (Edvinsson, 1997a). The literature offers an abundance of detail on various knowledge management metrics, but they can essentially be grouped into three main areas, Interpretational, fiscal, and IC scorecard methodologies.

2.13.2 Interpretational methods of knowledge measurement

The first group of knowledge measurement approaches discerned from the literature are the interpretational methods. Despite the many frameworks that have been put forward in an effort to measure knowledge, there still remains the difficulty of capturing the intangible nature of it (Wiig, 1997; Zyngier and Venkitachalam, 2011; Atherton, 2012). Essentially, a different approach is to try and capture the *result* or impact of knowledge on organisational performance, which can essentially lead to a more productive and tangible outcome (Andreeva and Kianto, 2012b).

A distinction can then be made by looking at the key differences between knowledge management processes and practices (Gold, Malhotra and Segars, 2001). There have been many scholars who have concluded that knowledge adds value to an organisation,(J.-C. Spender, 2006b; Mehta, 2007; Schiuma, Carlucci and Lerro, 2012), but that "value" element can be difficult to quantify (Ibrahim and Reid, 2005). Studies have also indicated that although knowledge management can bring change to an organisation to exploit its effectiveness, an amalgamation of methodologies has to be initiated, including codification and reciprocal sharing techniques (Dixon, McGowan and Cravens, 2009). This collaborative viewpoint is echoed by Ruggles, who suggests that a systemic approach to the measurement of knowledge management is required in order to maximise competitive advantage (Ruggles, 1998).

2.13.3 Measuring KM Practices

A small percentage of executives have reported that their organisations are adept at measuring the impact of KM practices (Harlow, 2008), and an equally small percentage report that due to the differences between performance and absorptive capacity, it is difficult to measure the impact of knowledge effectiveness despite increases in both (Wu and Chen, 2014). This points to the relevance of a dualistic approach taken by the literature which is reflected in the frameworks for performance *and* process-driven initiatives that have been driven by KM.

Process-driven frameworks or methods evaluate the progress of knowledge and illustrate progress by offering feedback and monitoring, which can be anything from measuring costs, quantity, production periods and investigating the minutiae of process development (Vestal, 2002). Process-driven metrics (according to Vestal) should be made clear from the outset, and this gives a more objective stance to the portion of success that can be attributable to knowledge-driven practices. However, even using a methodological approach such as this

(and utilising critical success factors and key performance indicators to measure progress) (Ward, Griffiths and Whitmore, 2002), will still not guarantee to capture specific advantages that knowledge can bring (Kalling, 2003a).

2.13.4 Qualitative Fiscal and Non-Fiscal Performance Indicators.

Obvious financial indicators that can be used to measure financial performance, such as simple ratios, levels of capital investment, and stock indicators etc. can become difficult to measure when knowledge is added to the equation. The impact of KM on a firm's financial performance is circuitous at best (Andreeva and Kianto, 2012a). The literature suggests that unless managers can identify a specific connection between KM and financial indicators, there will continue to be a tenuous link between KM and financial returns on investment (Massingham and Massingham, 2014a). In the world of knowledge measurement, the most prevalent way to realise organisational progression is to measure it against a defined set of fiscal standards, i.e., profit, sales, expenditure etc. ROI (return on investment), value dissemination, and cost benefit analysis.

These metrics are of value when looking at the gap between current and future performance and investment (Langfield-Smith, Thorne and Hilton, 2006). Massingham et al. posit that the value accrued as a result of KM processes can be presented against specific areas or outcomes, (Massingham and Massingham, 2014a), and this level of specificity is relevant to managers who require tangible fiscal links with KM processes. For example, Boudreau presents a framework for evaluating KM which is based on ROI, and consists of stocks and flows. This framework tests linkages between KM and competitive advantage (Boudreau, 2002).

The attempt to measure knowledge in fiscal terms is complex, and it can be broken down into the value it can bring to each part of the organisational value chain (Chyi Lee and Yang, 2000). The major difficult for KM is to map it directly to areas such as cost benefit analysis (Massingham and Massingham, 2014b), and ROI. Powell (2007) has derived a model for ROI, which, according to Massingham is "useful" for KM because it allows for the measurement of "financial and non-financial costs".

There have been numerous attempts in the literature to match KM performance to business processes, such as sales growth, increases in output, efficiency, customer satisfaction (Nold, 2011), and other quantitative performance metrics such as technology indicators (Vestal, 2002). But these indicators cannot take into account such attributes as proficiency, behaviour, management style, and ultimately the identification of the "knowledge source" (Garavelli, Gorgoglione and Scozzi, 2004), which leaves a difficulty in ascribing increases indefinable metrics to specific quantitative initiatives. While fiscal methods have been discussed, the wide variety of non-fiscal methods to measure KM performance has also been well documented.

Ultimately, Andreeva's view that the impact of KM on fiscal progress is circuitous points to the fact that there is no fundamental agreement on the impact of KM on a business. The extent of this impact is almost impossible to discern without recourse to some other business performance metrics (Andreeva and Kianto, 2012a) such as product enhancement (Kiessling *et al.*, 2009), customer awareness, and organisational standards (Zack, McKeen and Singh, 2009).

2.13.5 The Balanced Scorecard Approach

The balanced score-card is one of the most utilised performance measurement tools in the world. It has been estimated that it is employed by over 60% of Fortune 1000 organisations (Niven, 2011). Authored by Kaplan and Norton, it offers a multidimensional view of organisational direction and focuses on quantitative, qualitative, and fiscal measures to offer a link between organisational performance and the ability to quantify it. However, it does not measure knowledge directly (Andriessen, 2006), but can be adapted to account for knowledge measurement, firstly by aligning it to strategy, and then using the results to implement relevant decisions. It can then be used to align organisational KM resources with business strategy (Alhamoudi, 2001).

The balanced scorecard approach has been utilised in many examples, including the Fulton County Schools Example as discussed by Prochnik (Prochnik, Cristina and Ferreira, 2006), the New Zealand local Government study by Northcott (Northcott, 2012), and local Government in North Carolina, USA (Niven, 2011)

This would typically involve the implementation of a knowledge "audit", to attempt to find out who owns the knowledge capital, who created it, and where the gaps are (Lee, Cheung and Wang, 2010). It is also used as an intellectual capital scorecard methodology in its own right (Da Conceição Marques, 2005). The balanced scorecard has also been adapted to public sector use, for example, in the Education Authority in Texas, where it has been utilised to investigate performance (as an adaptive entitled the public sector scorecard). This has included service parameters such as student success, accountability, and effective business operation in their definable metrics (Moullin, 2002; McAdam, Hazlett and Casey, 2005).

2.14 Measuring Knowledge Quantitatively

There is a branch of knowledge measurement that is concerned primarily with obtaining statistical information principally from financial results. Even though KM has been shown to positively affect organisational financial performance (Durant, 2012), it is closely linked with information technology in terms of the recording and analysis of its effectiveness. This can then be used to improve financial performance, although there have still been calls for clearness and straightforwardness in the process (Mitchell and Boyle, 2010). This aim for specificity is mirrored in the next section, where financial metrics will be discussed in the context of KM.

Tobin's Q

This measurement instrument, developed by James Tobin in 1969, which, according to Edvinsson can be expressed in terms of a simple ratio of "market value to book value" (Edvinsson, 1997b), and the difference between the two, defines the measure of intellectual capital accruing to an organisation at any one point. If the difference is high or the "Q or quotient is higher than a referenced value, then the company is said to be rich in intellectual capital (Bontis, 2001b).

Economic Value Added (EVA)

The link between knowledge and intellectual capital is synonymous, and it has been mentioned in the literature as a possible starting point to indicate the status of IC, however, it is an indirect measure at best (Coakes and Bradburn, 2005). Adding value to any organisation is a difficult proposition; EVA attempts to do this by taking account of up to 164 adjustments in financial statements in order to attempt to account for the intangible elements such as IC and KM (Stern, Stewart III and Chew, 1995).

Value Creation Intellectual Coefficient (VAIC)

This is an evaluation method used as a measurement to link financial and intellectual capital and measure their respective efficiencies through value creation (Pulic, 2000). It utilises a series of metrics aimed at evaluating value through IC monitoring, such as capital employed, structural capital, and value creation intellectual coefficient (M. A. F. Ragab, & Arisha, 2015), but it requires a complimentary measurement metric in order to realise its full potential (Skyrme, 2000). Research has also suggested that the output from the VAIC would not necessarily add relevance to knowledge measurement as it would not measure access and frequency over time (Coakes and Bradburn, 2005).

2.14.1 Intellectual scorecard methodologies

The third group of KM metrics to consider are the measurements based around intellectual capital, which attempt to address the issues of uncertainty of financial metrics, in that they divide "value" into financial and intellectual capital and then "present" the findings in the form of an evaluative scorecard. Intellectual capital has been described as "packaged, useful knowledge" (Stewart, 2007), and the measure of IC can go a considerable way to approximating the usefulness of knowledge and KM (Luthy, 1998; Ragab *et al.*, 2015).

IC has been further classified by its principal components, which were originally proposed by Stewart in 1995. These are structural, relational, and human capital (Edvinsson and Malone, 1997), and have been part of the overall fabric of intellectual capital since its inception.

2.14.2 Intellectual Capital Components

Structural Capital

Structural capital ostensibly refers to the "capital allocated to the structure of an organisation" (Santos-Rodrigues *et al.*, 2013) and has been defined as the "knowledge, skills, experience and information institutionalized, codified, and used by databases, patents, manuals, structures, systems, routines and processes" (Youndt, Subramaniam and Snell, 2004). It has also been described as a framework and requisite support for human capital planning (Edvinsson and Malone, 1997). The objective behind the measurement of structural capital is to create a sense of the knowledge value of human capital and to allow organisations to capitalise on it (Stewart and Ruckdeschel, 1998). This view of structure being intrinsically linked to human capital is echoed by Schuller, who defines it as having the propensity to fundamentally change the measurement of human capital (Santos-Rodrigues *et al.*, 2013).

Relational Capital

Relational capital refers to organisational interaction with the outside world, typically consisting of customers, investors, and any other outside agencies (Roos, Edvinsson and Dragonetti, 1997), and is produced as these interactions become more complex and throughout the organisational life cycle. Researchers have also used value proposition to define relational capital through the generation of knowledge as the organisation grows and becomes more inventive (Santos-Rodrigues *et al.*, 2013), so it is important that relational capital is considered as a knowledge generation tool, albeit a collective one. This is important to understand as organisational relational interactions prosper the emphasis is placed on external interaction with economic forces (Bontis, 1996). The main processes that underlie intellectual capital and knowledge generation are symbiotic, with customer feedback forming an important part of knowledge generation. This in turn, feeds into relational capital and the generation of new knowledge, which can be used to enhance customer experience (Shelton,

Davila and Brown, 2005). Relational capital can also be extended through organisational expansion via agreements, partnerships and, conglomerative practice (DeNisi, Hitt and Jackson, 2003).

Human Capital

The term "human capital" is used to refer to human resources that are used to generate organisational worth (Viedma Martí and Enache, 2008). It is generally thought to have been encapsulated in the pioneering models of Schultz (1961) and Becker (1962), which focused on a dynamic set of human attributes and thus made the concept non-proprietary to organisations (Santos-rodrigues *et al.*, 2013). Human capital can be defined as "the combination of skills, qualifications, and expertise that provide individual character" (Bontis and Dragonetti, 1999), and is reflected in the knowledge that people have, which represents capability, intelligence, and innovation (Edvinsson and Malone, 1997). However, studies have indicated that knowledge generation within individuals, although crucial, does not always lead to increased levels of competitive advantage (Santos-Rodrigues, Dorrego and Jardon, 2010). But the appraisal and recognition of the importance of human capital as an asset is necessary to enhance knowledge collaboration and maximise public value (Agranoff, 2008).

2.14.3 Succession Planning

Often talked about in the same vein as knowledge sharing (Peet, 2012), succession planning is a successor of human capital that can allow an organisation to reflect how best to demonstrably transfer knowledge assets and devolve knowledge decision-making (Nadler-Moodie and Croce Jr, 2012). It has also been described as the identification of key positions and key data, which can allow the leveraging of performance and staff improvement. It can also allow appropriate decisions to be made vis a vis replacement personnel (Rothwell, 2010; Nadler-Moodie and Croce Jr, 2012).

Succession planning is predicated on the fact that a productive human capital audit has been undertaken, and resources have been identified (Nadler-Moodie and Croce Jr, 2012). It is also intrinsically linked to knowledge sharing and arguably demonstrates a further link to knowledge loss, as knowledge that is not shared could potentially be lost to employee disengagement, transfer, retirement or resignation (Peet, 2012).

2.15 Knowledge Management Qualitative Measuring Indicators

Skandia Navigator

One of the most popular frameworks ever put forward to measure intellectual capital was the Skandia Navigator. It was developed by Lief Edvinsson in the 1960s and was an attempt to measure intellectual capital through an amalgamation of both human and structural components through financial (tangible) metrics such as the company's balance sheet, and IC (intangible) metrics such as consumer and innovative capital (Chen and Zhu, 2004). However, the model has been criticised for only offering a "moment in time" view of knowledge throughput (Range, Issue and Roos, 1997) and for a lack of specific knowledge appraisal. For example, it assumed that employees were by virtue of work, automatically generating and sharing knowledge (Chen and Zhu, 2004).

Technology Broker

According to Bontis, the technology broker model offers organisations the chance to measure intellectual capital through the use of four metrics, "market assets, human-centred assets, intellectual property assets, and infrastructure assets" (Bontis, 2001a). Developed by Brooking in 1996, it offers three separate modes of measurement in order to calculate a measure of intellectual capital capacity, and an explanation of intellectual capital as consisting of four distinct types of assets. Market assets equate to relational capital, human capital assets relate to the intangible attributes that beget individual behavioural and skill patterns, intellectual property assets refer to issues around patents, legal obligations, and copyright legislation, and infrastructure assets refer to the mechanisms for quantitative metrics such as finance, information, relational databases, and risk appraisal (Brooking, 1996).

Intangible Assets Monitor

The intangible assets monitor, developed by Sveiby in 1997, puts the person at the heart of the IC development process and posits that all non-financial capacity estimation is the prevue of the human. This would suggest that all operational output from organisational processes are a direct result of human influence (Sveiby 1997), and ultimately "human action" is the reason for organisational knowledge.

Mc Luhan suggested that humans mainly use their abilities in a macro and micro environmental capacity, either dealing with relational (outward focusing) interactions or organisational (inward focusing transactions), (McLuhan, Fiore and Simon, 1967). This contention was built upon by Sveiby, who proposed that "individuals in organizations create external and internal structures to express themselves" (Sveiby 1997). The intangible assets monitor is broken down into three sections; employee competence, internal structures, and external structures. The employee competence area introduces specific performance metrics such as educational level, costs of, and length of time spent in the employ of the organisation. The internal and external metrics allow for views to be taken about the external "health" of the organisation and also monitor its internal status, via management information systems.

Intellectual Capital Index

Developed by Roos in 1998, the IC index is a consolidatory model that attempts to amalgamate all of the disparate IC components into one measurable index (Roos, Edvinsson and Dragonetti, 1997; Ragab *et al.*, 2015), and from this, it attempts to portray a picture of an organisations intellectual capital. It suggests that all organisational activities can be "grounded" into five major categories, monetary, competence, physical, organisational and relational. The value component is realised when the components are categorised into existing IC components, human, structural, and relational.

IC Rating

This approach is based on what Jacobsen describes as the gap between what knowledge can produce for an organisation and what the financial metrics show (Jacobsen, Hofman-Bang and Jr, 2005). The IC rating builds upon work done by Sveiby in that it takes the three main components of IC (human, structural and relational capital) and adds what Jacobsen calls a "business recipe" to it. This is composed of the business mission and vision, strategy and environment (Jacobsen, Hofman-Bang and Jr, 2005). This model, however, does not take account of an organisations value creation characteristics and its individuality (Roos, Bainbridge and Jacobsen, 2001).

The IC rating tool, which is based on the IC rating model and developed by Hofman et al, attempts to assess an organisations intangible assets from three different perspectives, effectiveness, risk, and renewal. Combined, these three metrics attempt to overcome the limitations of the "snapshot" view-point by looking at risk against current and future effectiveness and renewal and expansion of current effectiveness.

Value Chain Scoreboard

The value-chain scoreboard is based on a three step model which looks at intangible assets using the value chain model. There is a correlation between this model and the IC model in that value is adduced from the discovery and exploitation of organisational effectiveness. However, this model examines innovation by way of a process which begins with discovery and learning, which consists of internal renewal, acquired capabilities and networking, then implementation, which consists of Intellectual property, technological feasibility and the use of online processes, and finally commercialisation which consists of customers, performance and growth prospects (Lev and Daum, 2004).

Intellectual Capital Statement

According to Mouritsen, intellectual capital statements are forms of reporting aimed at administering KM processes in an organisation (Mouritsen, Larsen and Bukh, 2001). They are produced in the same way as financial statements in order to facilitate the production of an organisations intellectual capital standing. With intellectual capital being described as the "knowledge and knowing capability of a social collective" (Nahapiet and Sumantra, 1998), it is suggested that intellectual capital statements can form a nexus of knowledge measuring ability because they incorporate "assets", and attempt to engage employee knowledge and abilities. These are coupled with organisational paradigms such as technology and business methodologies (Mouritsen, Larsen and Bukh, 2001).

However, intellectual capital statements espouse a methodology akin to a mixed methodological research one, in that there is a "combination" of tangible and intangible, in the case of the intangible what Mouritsen calls "a story-line", or a "knowledge narrative",

which serves to present a reflection of the organisations knowledge capabilities (Mouritsen, Larsen and Bukh, 2001).

This is an interpretation of an organisational KM strategy, based on the tangible measurement of strategic imperatives and resources available to meet them (Ragab *et al.*, 2015). These are then used to inform a series of management challenges, which are measured through what Mauritsen calls the "Intellectual capital accounting system".

2.16 Human Capital (IC) Methods of Knowledge Measurement

The crux of measuring knowledge lies in the premise that knowledge is generated by the individual (Roberts, 2015). This would indicate that in order to be competitively advantageous, knowledge residing in the organisation has to be shared, extrapolated, pooled, or transferred between individuals and ultimately become the property of the organisation (Mclean, 2002). In essence, the most effective way of measuring knowledge then is to examine the knowledge held within the individual and look for a suitable method of sharing or transferring this knowledge to increase organisational strategic advantage. Human capital measurement indexes focus on the human element of intellectual capital, and from this standpoint, attempts to measure the knowledge that is generated, stored, disseminated, shared, and transferred within and between individuals (Ragab *et al.*, 2015).

As a barometer of knowledge measurement, human capital is critical (Boudreau, 2002). It can augment and complement financial measurement, and symbiotically, the knowledge gained from human capital can be used to inform decisions in relation to employee retention and divestment, which can have a financial impact on the organisation (Cappelli, 2000). Cumulatively, to measure the worth of human capital with regard to knowledge, it must be looked at in terms of how the knowledge that is generated by individuals can be *successfully* translated into competitive advantage.

Human Capital Index

The human capital (HC) index is a quantitative methodological approach to discovering how to correlate organisational value with the intangibility of human capital. A longitudinal study developed by Watson Wyatt identified this correlation and analysed the data over six "key links" between separate dimensions, rewards, flexibility, retention, communication,

technology, and resource utilisation (Ragab *et al.*, 2015). The HC index utilises compound regression analysis to inform the level of effectiveness between human capital and value creation (Watson Wyatt Worldwide, 2002). This enables a direct comparison to be made between the two. The key contention of the analysis of the human capital index is that "data over time illustrates that human capital practices lead to value creation" (Watson Wyatt Worldwide, 2002). The HC index also strongly indicates that the rewards structure should be emphasized in the workplace in order to encourage knowledge creation and retain knowledge talent.

Human Capital Monitor

The human capital monitor was developed by Mayo and links three areas of measurement, knowledge that people give to an organisation and the value that is accrued to the organisation as a result, the quantifiable fiscal and non-fiscal value that is produced as a result of this process, and the dedication and enthusiasm of people. This, according to Mayo, will increase if the environment is conducive to knowledge sharing (Mayo, 2001). Mayo suggests that if the person is to be categorised not just as an asset, but valued also, then it is imperative that an organisation considers the metrics that are relevant to the person and not just what they are capable of. With this in mind, the human capital monitor was developed to look at people as assets, and Mayo proposed a value entitled the "Human Asset Worth" or (HAW), which consists of EC (employment cost) × IAM (individual asset multiplier) x 1,000 (Mayo, 2001). The employment cost (EC) consists of Base Salary plus the value of benefits, plus employer taxes (Ragab et al., 2015).

Human Capital Hierarchy of Measures

Developed by the Civil Aviation Authority in the UK in 2006, the Human Capital Hierarchy of Measures was set up in response to attempts to measure human capital. Using a combination of the balanced scorecard approach, coupled with a bespoke methodology, it first attempted to define what constituted human capital, based around three separate criteria;

- External customer perception of performance

- Goal attainment

- Assessment of staff skills and competencies.

Adapted from Robinson (2009)

The "Hierarchy of Measures" stresses the value of human capital measurement by alluding to the value created not just by people, but as a result of the amalgamation of strategy and goal alignment (Robinson, 2009). This theme of marrying the intangible nature of human knowledge ability with tangible goals and goal setting is echoed in the "hierarchy of needs" (Robinson) with a flow process that goes between four levels from level 1, workforce data, to level 2 operational data, level 3, outcome measures, and level 4, performance metrics (Robinson, 2009).

Human Capital Readiness

This indicative measure was developed as a result of the extension of the balanced scorecard and led to it being referred to as the "HR Scorecard" (Norton, 2001; Ragab *et al.*, 2015). Human capital readiness examines the suitability of positions in the organisation to the strategic rationale behind organisational goal congruency between people and competencies (Kaplan, R., y Norton, 2004). This leads to the development of what Norton et.al describe as "job profiling" or "competency profiling." This profiling allows the organisation to assess

what level of knowledge and skills are required by individuals to successfully carry out their roles (Kaplan, R., y Norton, 2004). This has the added benefit of allowing the organisation to create role profiles for both potential job applicants and existing employees transitioning into new roles. It also serves to evaluate the level of strategic alignment between disparate organisational strategies.

The table presented overleaf is included in order to give the reader a summation of the models presented in this work and present details of the salient positions and validity of each. Researchers will be able to avail of this table as a quick reference guide to knowledge measurement indicators, and it serves to crystallise the discussion on knowledge measurement metrics.

Table 6 Principal Models of Classification of Intellectual Capital

Framework / Model	Author	Type of Intellectual Capital	Metric Aggregation	Financial Validity	Observations
Skandia Navigator.	Edvinsson / Malone (1997).	Human Capital. Structural Capital.	Over 100 metrics evaluating a component of IC, and concurrently measuring financial health. The model combines financial values into a unified value and combines them into an "efficiency indicator".	The overall financial value of IC is then equal to the efficiency indicator multiplied by the unified financial value.	Does not offer a linear measurement, rather a "snapshot" that does not take account of knowledge flow. There are inherent assumptions in the metrics.
Balanced Scorecard.	Kaplan / Norton.	Human Capital. Structural Capital. Relational Capital.	Financially Measurable. Client Centric. Internally based for Knowledge Generation. Based on Organisational Progression and strategic alignment.	Strategic "translation". Only if strategy is "translated" and training is administered. Metrics liked together through causal aggregation and assumption.	Relies on a "causal" relationship between the various sections and does not provide for future predictions if strategic links are not clearly articulated.

IC Index	Roos et.al (1998)	Human Capital. Structural Capital. Relational Capital.	Five areas, weighted to assess their relevance, and combined into a single index.	Does not give a specific financial value.	Organisation specific, so the results are not generalisable.
IC Rating	Jacobsen (2005)	Human Capital. Structural Capital. Relational Capital.	Assessment completed through the evaluation of over 200 indicators, which are measured through interviews. Reviewed through a "grading" system, but no financial indicators.	Linked with an overall indication of knowledge sharing.	Not adaptable to individual organisations.
Value Chain Scoreboard	(Lev, 2001)	Structural Capital Relational Capital.	Quantifiable knowledge aligned with strategy.	Financial specifics such as revenue, market share, and royalties etc, aligned with knowledge and strategy.	Results may not be generalisable to individual organisations.
Intellectual Capital Statement	Mouritsen et al. 2001	Human Capital Structural Capital Relational Capital.	Incorporate the "human element" as a resource and attempts to align it with knowledge and provides its own "accounting system" to measure strategy.	No specific financial indicators, however, it looks at KM from a "process" standpoint and informs a series of "narratives which are then used to predict and assess org goals.	There is a risk of bias in the writing of the statements as they are authored by individual managers.

(Source Compiled by Author)

2.17 Individual Knowledge Measurement

It is clear from the literature that attempts to measure knowledge are based around holistic and composite measures that try to capture its intangible nature by either aligning or marrying its perceived usefulness with specific performance, fiscal, and IC methodological approaches. The difficulty, however, lies in attempting to map it directly to these areas, for example, either cost benefit analysis (Massingham and Massingham, 2014b), building a process around the utilisation of specific performance metrics to incorporate knowledge (Ward, Griffiths and Whitmore, 2002) or attempting to measure the outcome of a knowledge process in an added value context and align it to business strategy (Alhamoudi, 2001).

This has disadvantages, however, as the nature of any attempt to introduce intangible data into a quantitative process can lead to errors, such as the possibility of "response bias" (Gold, Malhotra and Segars, 2001), the lack of clarity around knowledge distribution, (Edvinsson 1997a), and the difficulty in expressing KM benefits or value in monetary trems (Sveiby 1997).

Valuing Individual Knowledge

Perhaps the ultimate difficulty for organisations to overcome in terms of managing knowledge is the argument that it is impossible to "separate knowledge from the knower" (Ray and Clegg, 2005), and therefore it is impossible for individual knowledge to become organisational knowledge (Massingham, 2014). This is an empiricist viewpoint and one that attributes little value to the proposition of capturing and storing knowledge. Therefore, the *value* that can be captured and articulated is the aim for most knowledge management scholars, and many of the measurement tools that have been discussed attempt to inculcate elements of what Massingham describes as the "KM Toolkit" in order to assess knowledge.

This can be done by either valuing it (Andriessen, 2004), adding or aligning metrics (Massingham, 2013), and articulating the potential risks involved in managing organisational knowledge (Massingham, 2010).

Given its importance, the measurement of individual knowledge is clearly then the most relevant area of knowledge measurement and one which to which attention is now turned. The areas of human resource management and psychology, ergonomics, sociology, and philosophy are all intrinsically related to human cognition, but in terms of the measurement of organisational progress and value, the first two perhaps make the most cogent contribution to the area of human capital and individual knowledge measurement. The success or other wise of this process depends on a number of antecedents, including the "absorptive capacity" of the individual (Cohen and Levinthal, 2000), knowledge aggregation and expression (Grant, 1996), and the ability to implement it through practice (Kogut and Zander, 1992), by transforming it from tacit into explicit (Wu, Senoo and Magnier-Watanabe, 2010).

Performance and rewards

Performance (and the rewards offered for it) account for a vast proportion of basic intrinsic and extrinsic motivational decisions made by individuals in organisations. Motivation is a complex issue, but according to Lin, in a KM context, it includes " interaction, interpersonal trust, openness in communication, and social reciprocity" (Lin, 2011). Motivation affects performance, and ultimately the ability to engage with organisational processes through empowerment and job enrichment (Lin, 2011). Ultimately, humans operate on an implicit costs benefit analysis when deciding on a course of action (Osterloh and Frey, 2000), and if the benefits outweigh the costs, then the course of action will continue (Kelley and Thibaut, 1978).

Knowledge is another, (albeit important manifestation) of this multifaceted and complex transaction that will engage a person if they perceive the benefit of it (Kankanhalli, Tan and Wei, 2005). In order to offer an appraisal of how well a person is engaging in a process, assessment of their performance is undertaken in organisations in a variety of ways (Ragab *et al.*, 2015), as goals and accomplishment enjoy a somewhat symbiotic relationship (Fletcher, 1997). This can be implemented by way of fiscal reward or career progression / promotion etc. In order to offer rewards, an organisation has to appraise the performance of the employee, and this is usually undertaken by way of evaluation, feedback, interviews, or questionnaires (Boice and Kleiner, 1997; Prowse and Prowse, 2009).

Performance and Motivation

In order to encourage people to develop, divulge, and share their knowledge, motivational aspects of performance can and should be taken into consideration (Ragab *et al.*, 2015). If the organisation does not reward people directly for their adaptability and initiative, then there is a possibility of poor efficiency gains, which can lead to knowledge loss as a result of the lack of transfer of knowledge and the possible transfer of the knowledge holder to another organisation (Whelan and Carcary, 2011a). Competence or competency-based evaluation cover specific elements of causality between motivation and reward as they are based on an evaluation of individual adaptation and behaviour (Usoro *et al.*, 2007).

The term "competence" can be used to illustrate the extent of a person's knowledge, or, the extent of a person's knowledge to complete a specific task (Von Krogh and Roos, 1995). This would indicate that a person's knowledge of a task and the knowledge of how to complete it are synonymous; moreover, that competence emanates from distinct knowledge in relation to task completion (Godbout, 2000).

Conclusion

The foregoing section of this chapter introduced the various ways and attempts to measure knowledge while also discussing the literature in relation to individual knowledge measurement. This important distinction is made as it is imperative both from the standpoint of knowledge generation and the effectiveness of knowledge, that the individual's propensity to generate knowledge is discussed both from a motivational and organisational perspective. The following section will introduce the concept of public sector knowledge and knowledge management and measurement, and the key differences between the public and private sector with regard to both. This section will also introduce a public sector taxonomical framework which has been published in the literature which will aid current and future research by consolidating the literature in relation to public sector knowledge specifics.

2.18 Public Sector Knowledge

Introduction

The rise of knowledge and knowledge management as a separate research domain has happened concurrently with increasing academic interest in the field (Roberts, 2015). However, research into knowledge and the management of it has mainly been confined to private sector organisations, with relatively little investigation into the public sector (Garlatti *et al.*, 2014). This is due to the comparatively insular nature of public sector organisations, which have somewhat divergent reporting parameters, goal setting, and more bureaucratic, structural rigidity than their private sector counterparts (O'Riordan, 2005). Therefore, attempting to bring a knowledge management culture into the public sector is considerably more difficult than in the private sector (McAdam, 2000a). The public sector also displays a limited number of research contributions investigating the identification, valuation, and management of its knowledge resources (Garlatti *et al.*, 2014), which is interesting given that it is an essential element in any society, and its decision-making largely affects societal interests.

As the conduit for governmental decision-making, public sector success or failure can effectively determine public viability (Wiig, 2002). Governmental organisations exhibit tendencies towards unusual and bureaucratic cultures mired in hierarchical structures, which create peculiar challenges that can make knowledge management implementation efforts difficult. Historically, the public sector has been reticent in exploring the advantages of knowledge management strategies, and there is a lack of evidence and research on public sector knowledge management in general (Edge, 2005a). This can make it difficult to understand the nature of knowledge in the public sector and effectively evaluate its efficacy (Massaro et al., 2015), and difficult to analyse its linearity (Nordin, Pauleen and Gorman, 2009a)

Research has also indicated that innovation in the private sector is slow to be adopted in the public sector (Da Conceição Marques, 2005), and this is due in no small part to its cloistered nature and lack of specific accountability. Some research has indicated that the differences between the public and private sector mitigate the effective adoption of KM practices from one sector to the other (Cong and Pandya, 2003a). This may be due in part to the uniqueness of the public sector in terms of its hierarchies, as mentioned, but also the disparate goal setting, revenue generation, and political and legislative compliance frameworks that accrue specifically to most public sector contexts. (Cong, Li-Hua and Stonehouse, 2007). Some literature also suggests that effective knowledge management practices can improve private and public sector performance equally (Al Ahbabi *et al.*, 2019); however, most public sector organisations exhibit greater foci of control than their private-sector counterparts and are subject to ongoing peripheral scrutiny by way of government mandates and public expectations (Chawla and Joshi, 2010a).

This can make public sector performance difficult to measure, as it is subject to scrutiny by constantly changing political, legislative, and societal oversight. Performance measurement is also difficult given these changing contexts, and this has necessitated the adoption of existing methodologies and models, for example, the balanced scorecard, in order to measure public sector effectiveness (Northcott, 2012). However, this landscape is changing as the public sector is coming under increased pressure to reform and improve its effectiveness (O'Riordan, 2005). New public management, for example, is attempting to bridge the gap between public and private sector accountability and performance measurement by applying private sector values to the public sector, principally amongst them privatisation and de-bureaucratisation (Siddiquee, 2010). All of this makes the public sector an ideal candidate for research.

According to Druker (1995), the collective knowledge residing in the minds of its employees, customers, suppliers, etc., is the most vital resource of an organisations growth, even more than the traditional factors of production, i.e. land, labour and capital (Chawla and Joshi, 2010a). Knowledge has been recognised as a valuable resource from a strategic perspective and a foundation for competitive advantage in today's business environment (Ragab & Arisha, 2013c). However, despite the increase in the awareness of its potential, there is an apparent lack of clarity in relation to recognising knowledge and the management of it as a discipline in the public sector due to the disparate nature of public service delivery and ever changing service orientation parameters that make policy implementation complex (Cong and Pandya, 2003a).

These complexities are further exacerbated by the fact that the public sector also experiences more delays in dealing with the concept of knowledge management than the private sector (Bretschneider 1990). Moreover, the public sector faces difficulty in expressing its goals clearly (Chun and Rainey, 2005). Without a clear strategy and clear aim, KM initiatives are historically more challenging to inculcate in public organisations (Kim and Lee, 2004). Employees in the public sector generally view knowledge (particularly tacit) as personal intellectual property, and historically, government organisations have specific incentives and divergent reporting parameters when compared to private companies in relation to the management of knowledge (O'Riordan, 2005). For example, Gorry undertook two case studies in the public sector (in client services and school teacher communicative practice) and found that technology can have a positive effect on knowledge sharing, even though the complexities of the public sector can make this a complicated endeavour (Gorry, 2008).

2.18.1 Public Sector Statistics

According to the World Bank, the cost of effective governance and the provision of essential public services – such security, health, education, government services, basic utilities, and provision of essential structural maintenance and social policy, has cost on average, twenty five percent of global GDP between 1973 and 2010 (Figure 4). This places a huge burden on governments to ensure that the cost of providing all of these services is justified because the public sector is not only a key employer but a consumer of large amounts of tax revenue (Linna *et al.*, 2010). In some egalitarian countries, Sweden, for example, the public sector is such a proliferate employer that its workforce outnumbered its private-sector counterpart post 1980 (Hogan and Feeney, 2012).

Figure 4 Public Sector Expenditure as a Percentage of GDP
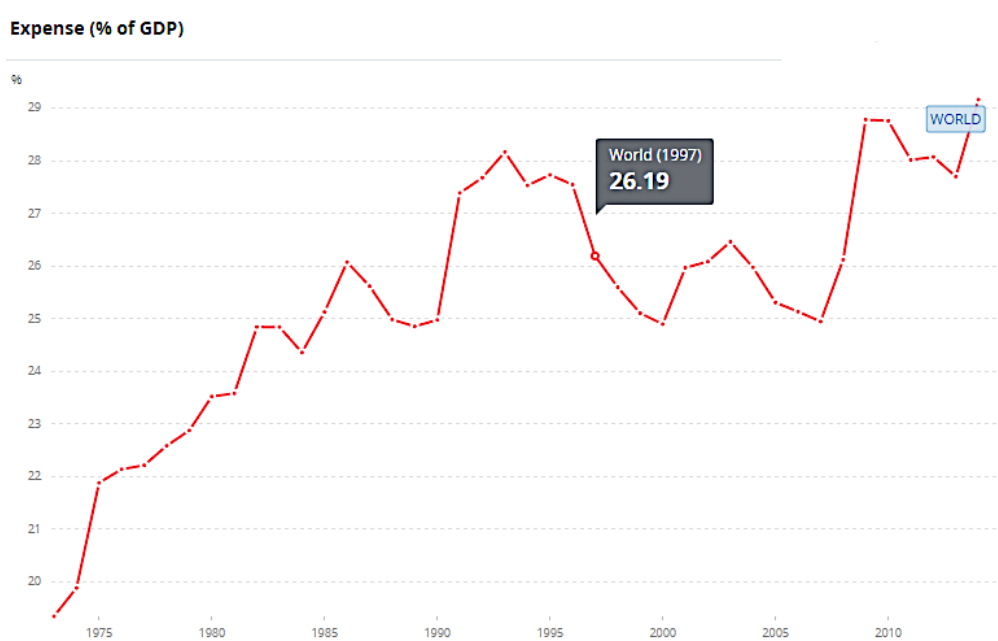
(Source; World Data Bank)

Today's public organisations are confronted with considerable challenges to operate within the global knowledge economy and have to continuously adapt to shifts in societal needs, behaviour, and expectations (Abdullah and Date, 2009). To keep pace with global trends and new public demands, public sector organisations have had to initiate new paradigms that place the management of intangible assets at the core of their strategies.

With knowledge being the most "recognised" intangible, ironically, recognising the vital role of knowledge resources in driving organisations can lead to better performance. The idiosyncratic nature of governmental institutions creates peculiar barriers to attempts to manage knowledge within the public domain (Cong, Li-Hua and Stonehouse, 2007). Public organisations tend to be highly bureaucratic and cloistered in rigid hierarchies; hence they require knowledge management strategies that are able to address their specific context and equally consider their unique cultural and legal implications.

2.18.2 The Public Sector and Knowledge Management

The public sector provides a particular context of analysis for KM since it has mainly intangible objectives, and consequently, provides some services that are intangible in nature (Garlatti *et al.*, 2014). Although there are considerable research efforts in other KM areas, there is a dearth of evidence on conclusive change brought about by KM initiatives in the public sector (Luen and Al-Hawamdeh, 2011). There is also a lack of awareness of the impact and relevance of KM on the performance metrics of public sector organisations as compared to their private-sector counterparts (Cong & Pandya, 2003).

Due to increasing government accountability and commensurate budgetary constraints, the public sector is also under increased scrutiny to echo its private-sector counterpart in terms of productivity and service quality. This has brought a new urgency to public sector research in relation to recognising the role of knowledge and engaging in KM endeavours to achieve

strategic goals (Parker & Bradley, 2000). For example, by implementing and improving knowledge sharing processes in the public sector, service provision in areas such as healthcare and education will commensurately improve (Gorry, 2008). Productivity in the public sector has also come under scrutiny in recent years in terms of the difficulty in measuring it (Linna *et al.*, 2010), as the problem lies in a lack of discernible transactional processes for providing services to the public (Boyle, 2006).

Hence, managing knowledge ranks highly on many governmental agendas (Cong and Pandya, 2003a). Some of the reasons for this were made explicit in the Organisation for Economic Co-Operation and Development (OECD) survey for Ministries and Departments of Central Government in Member Countries in 2003. The OECD made the following observations with regard to the management of knowledge in the public sector;

1. Knowledge is an essential construct of public sector performance measurement. Service delivery and orientation are fundamental public sector tenets, and competition from private sector organisations is increasing in areas such as education and health. This has placed an onus on governments to ensure that knowledge and communication strategies from a significant part of policy implementation.

2. Increasing market competition has placed more pressure on public sector agencies, particularly in the service provision sector. As a result of this increasingly competitive environment, the public sector is under more scrutiny than ever before with regard to value creation and delivery.

3. Knowledge loss is a crucial factor for the public sector, as departing employees cause particular issues around knowledge depletion. This is exacerbated by hierarchical structures bereft of efficient communication channels and a lack of identification of critical knowledge.

4. Public sector organisations need to embark on initiatives to retain knowledge, or it will adversely impact on their service delivery ability. They also need to imitate some of the successful practices in use by their private sector counterparts in order to maximise market opportunity.

<div align="right">**(Source; OECD, 2003).**</div>

2.19 Key differences between Public and Private sector

The differences between public and private sector organisations have been presented (on the part of the public sector) as an internal duality between the motivation of the sector to affect societal benefit, implement change, enact exchequer policy, and shape public value on one hand, and the altruistic propensity of the individuals that comprise it to affect this change (Sean T . Lyons, Linda E . Duxbury Carleton, 2003). Motivation can thus be posited as an initial value in illustrating the potential differences between the public and private sector (Frederickson and Hart, 1985). This is particularly evident given the inability of the public sector to contend with the private sector in terms of extrinsic reward structures (Alonso and Lewis, 2001) and offer clearer career options to employees (Argyriades, 2003).

The role of *values* has been somewhat different between public and private sector organisations as historically, private sector performance has been inherently discernible and measurable (Peter and Waterman, 1982). This is reflected in the rise in research around topics such as organisational culture, corporate value, and managerial performance which echo private sector value creation ideals (Anderson, 1997). The public sector, conversely, views values as decision enablers and policy enhancing tools, which allow them to convert government decisions into policies which serve the public (Tait, 1997 ; Van Wart, 1998).

Decision Making

Decision-making processes vary greatly between the public and private sectors, and this is due primarily to the unique demands placed upon each (Nutt, 2006). The most influential aspect of decision making is context, as this has the effect of placing a particular agency in a role that dictates its mandate (Papadakis, 1998). For public and private sector organisations, roles are key in dictating management approaches to authority, devolving responsibility, and dealing with stakeholders and customers (Chaffee, 1985).

Due to the fundamentally different approaches in the way public and private sector organisations deal with stakeholders, customers, and clients, context influences decision making ability in each and makes them unique (Mintzberg, 1973).

The differences between the public and private sector have resulted in a specific stream of research, initiated by Rainey Backoff and Levine, (1976). This research has uncovered the fact that particular *demands* place unique pressures on each and result in alternative practices that have been suggested and implemented (Blumenthal, 1983; Perry and Rainey, 1988). For example, public sector organisations are viewed as being limited in their strategic making autonomy due to governmental restriction, legislative disclosure obligations, disparate hierarchies consisting of a mix of political and business appointees, and exchequer constraints (Nutt, 2006). Table 7 is presented in order to illustrate the key differences between the public and private sector and afford the reader clarity around key issues that have knowledge relevance.

Table 7 Public and Private Sector Key Differences

Factors	Private Sector Organisations	Public Sector Organisations	Impact on Strategic Decision making
Environmental Market	The buying behaviour of people defines the market.	Oversight bodies make up the market.	Decision-makers are obliged to seek out views of people in oversight bodies in public sector organisations.
Cooperation Versus Competition	Competition among organisations that offer a given service.	Collaboration among organisations that offer a given service.	Competition shifts to collaboration in public organisations, so key players must have a role in suggesting alternatives.
Data Availability	Performance and intelligence data available.	Performance and intelligent data limited.	Limited availability of performance and intelligent data declines in public organisations.
Constraints	Autonomy and flexibility limited only by law and the need for internal consensus.	Mandate and obligations limit autonomy and flexibility.	The need for consensus increases in public organisations.
Political Influence	Political influence indirect and internal.	Political influence stems from the authority network and from users and stakeholders.	More time is required to balance user needs with demands of oversight bodies in a public organisation.
Transactional Security	Can sequester the development of ideas.	Cannot sequester the development of ideas.	Alternatives are more apt to be disclosed as they are identified in a public organisation.
Ownership	Ownership vested in stockholders whose interests are interpreted using financial indicators.	Citizens act as owners and impose their expectations about organisation's activities and the conduct of those activities.	More people are involved in decision making in a public organisation.
Organisational Process Goals	Goals often clear and agreed upon; efficiency.	Goals can be shifting, complex, conflict ridden, and difficult to specify.	Clarity about the desirability of an alternative declines, increasing the time to make decisions in a public organisation.
Authority Limits	Power vested in authority figures.	Stakeholders beyond the authority leaders' control influence.	Search time and resources are more limited in a public organisation.

Adapted from Nutt and Backoff (1993)

2.19.1 Public Sector Pressures

The role of KM in any organisation is a complex one (Sense, 2007) as has been illustrated in the foregoing sections of this chapter. To suggest that the inculcation of KM practices in an organisation immediately bestows competitive advantage is simplistic, and it may not occur if the complexities of KM, people, processes, and technology) are not understood (Sense, 2007). Within the public sector, KM has the ability to enhance development (Amayah, 2013b) and capture knowledge that may be lost due to staff turnover, transfer, or retirement (McAdam and Reid, 2000). However, the public sector has a mandate to deliver services for societal development; ergo, the *delivery* of knowledge and management of knowledge as a product is unique to it (Denner and Blackman, 2013). This is a view shared by Popa who suggests that knowledge processes are positive in the public sector but can be mitigated by the quality of (in the case of healthcare, for example), the health care system itself, which can affect the delivery of that knowledge (Popa and Ștefan, 2019).

Citizens expect service delivery collectively through relevant public sector departments or individually through individual knowledge workers who deliver the information they need when required (Denner and Blackman, 2013). The disparate levels of public sector service delivery dictated not only by mandate but complexity calls for levels of knowledge and expertise around each (Abdullah and Date, 2009). This also implies value insofar as knowledge is needed to deliver services in a pragmatic and cohesive manner, and timely knowledge is necessary in order to engender societal approval of public sector performance (Laihonen and Kokko, 2020).

The uniqueness of the public sector with regard to knowledge also lies in its ability to share its collected knowledge, not only with its customers and stakeholders but with other public sector entities that can benefit (Denner and Blackman, 2013). This can be done by creating knowledge sharing environments that echo either communities of practice (Soekijad, Huis in't Veld and Enserink, 2004), knowledge networks (Lincoln, Gerlach and Takahashi, 1992), or intranets (Stoddart, 2001; Grunig and Dozier, 2003), all of which act as vehicles for knowledge which can be assimilated into organisational processes and procedures.

Notwithstanding the distinctiveness of the public sector, creating knowledge, and ultimately sharing it is also a difficult issue (Abrudan *et al.*, 2011). Primarily, there appears to be a lack of perception in the public sector about the value of KM; consequently, accessible knowledge, if not identified as such, may not utilised correctly (Veenswijk, 2006). The formal structures that beget complexity in the public sector can account for delays in the implementation of KM initiatives (Bretschneider, 1990), and its multifaceted nature can make knowledge execution difficult (Kim and Lee, 2004). In this context, the following sections discuss a number of themes that received particular attention from KM researchers when investigating the public sector.

2.19.2 Technology and Knowledge in the Public Sector

The role of technology in the KM field is a complex one. The codification of knowledge can reverse its effectiveness and bring it to an information state which can belie its role and importance (Gau, 2011). There is a symbiosis between KM and technology, which is based in the enabling capacity of IT to facilitate communication across knowledge networks, yet it does not necessarily promote it (Hendriks, 2009). Nevertheless, the use of technology as an enabling mechanism for knowledge dissemination is of vital importance for public sector organisations (Booth, 2000).

For example, the emergence of e-government as a dominant paradigm in public sector reform has enabled new perspectives for KM (Jain, 2009). However, it is contended that without a knowledge sharing culture, technology will not be enough to stimulate knowledge flow (Syed-Ikhsan and Rowland, 2004); moreover, the appointment of Chief Knowledge Officers (CKM) in some organisations is seen as a positive step towards codifying knowledge effectively (Jain, 2009). Research into KM in the public sector with technology as a predominant theme has indicated that it has a multifaceted role to play in the generation, dissemination, and personalisation of knowledge (Pentland *et al.*, 2012).

The literature suggests that there is a relatively small amount of public sector KM research with technology as a dominant theme. This may have its roots in the subjective nature of knowledge (Spender, 1998), as the objectivity of technology may mitigate against its popularity in the research. It has even been suggested that knowledge should be dichotomous from technology and removed from the ICT domain where it is too often confused with information and data (Samiotis, Stojanovic and Ntioudis, 2014), nevertheless there is a mandate for the public sector to provide information to its stakeholders and ICT is the most effective catalyst for this to occur (Bučková, 2015).

The explosive growth in information technology, fuelled primarily by the internet and the proliferation of social media, has compelled most public sector organisations to utilise technology for information exchange and even employ chief knowledge officers as mentioned, whose primary remit is the implementation of knowledge management practices through technology (Kannabiran and Pandyan, 2010).

However, technology alone should not be responsible for the success of KM processes rather, according to Tsui, a potential stimulator for the implementation and alignment of knowledge management practices with business processes (Tsui, 2005). Interestingly however, the literature also has opposing views on the role of technology with Holsapple, for instance, suggesting the very arguments that scholars engage in with regard to separating KM from ICT are detracting from the relevance of its potential contribution (Chi and Holsapple, 2005), and Alverenga arguing that KM could support the techniques for the overall transformation of digital government strategy (Alvarenga *et al.*, 2020).

2.20 Knowledge Transfer and Knowledge Sharing in the Public Sector

Studies have shown that many individuals are reluctant to share knowledge or to engage with knowledge management initiatives (Goldfinch, 2007). Some perceive knowledge as power and are hesitant to share for fear it may weaken their own authority (Sohail and Daud, 2009). This situation is exacerbated in the public sector due to its hierarchical mechanistic structures, which can be less incentivising and provide fewer opportunities for collaborative working environments than its private-sector counterpart (O'Riordan, 2005). There also appears to be a lack of perception in the public sector about the value of knowledge and knowledge management. Consequently, accessible knowledge, if not identified as such, may not be utilised correctly (Veenswijk, 2006).

Laihonen also refers to a "need" for knowledge transfer within the public sector, as collaboration is all-important, not just inter-departmentally, but between various public sector entities, such as local government agencies involved in policy dissemination (Laihonen and Mäntylä, 2017).

Knowledge Sharing can be defined as "the transfer of knowledge from a source to a recipient" (Berends, 2005). The transfer of knowledge once generated is of paramount importance to organisational knowledge management (Monavvarian and Kasaei, 2007), and it is more effective to have employees transfer knowledge voluntarily rather than bureaucratically (Armistead and Meakins, 2007). This concept is perhaps the most important issue in successful KM, as knowledge exchange is essential for KM success (Davenport and Prusak, 1998) and the effective codification of this exchange is vital in building successful knowledge repositories for future sharing and collaboration (Cress and Martin, 2006).

Knowledge sharing also enables the dissemination of best practices and leverages knowledge between different parts of the firm, ultimately improving overall organisational performance (Amayah, 2013). The sharing of knowledge is a vital part of the process of KM, and it is critically important in the public sector because its client focus places a specific emphasis on continuous knowledge sharing, which is required between public workers and the public (Gorry, 2008).

A common challenge that emerges in the discussion of knowledge sharing is individual's reluctance to share knowledge with others due to a potential self-serving bias stemming from the perception of knowledge as a source of power and unique value (Sohail and Daud, 2009). Knowledge sharing in the public sector has been researched in terms of cultural diversity, individuals, and management, and has been carried out in areas such as the factors affecting individuals capacity to share knowledge in public sector organisations (Amayah, 2013b), and the ability of extrinsic and intrinsic motivational factors to enhance knowledge sharing among managers, (Tangaraja *et al.*, 2015).

Research has also explored knowledge sharing barriers which impede the transfer of knowledge among employees due to either organisational or individual issues. The main challenges to successful knowledge sharing in the public sector include lack of management recognition, few rewards for knowledge sharing behaviour, and inadequate organisational IT infrastructure (Denner and Blackman, 2013).

Kumaresan for example had conducted knowledge-sharing studies in public libraries in the Middle East and found that culture and language account for a lot of the impediments to knowledge sharing (Kumaresan and Swrooprani, 2013). Tangaraja *et.al* in a study of Malaysian public sector managers, found that motivation and organisational socialisation plays a key role in the propensity to share knowledge (Tangaraja *et al.*, 2015).

Moreover, there are some areas of the public sector that are more conducive to knowledge sharing than others, such as areas of higher education (Mohayidin *et al.*, 2007), where knowledge creation and dissemination is almost a function of their productivity (Metaxiotis and Psarras, 2003). Other areas of the public sector are more difficult to engender cultures of knowledge sharing and individual knowledge identification, such as bureaucratic, pseudo-military organisations, for example, the police and military (Gottschalk, Holgersson and Karlsen, 2009).

Perhaps unsurprisingly, over one hundred articles in the literature describe knowledge sharing as a predominant theme of public sector knowledge management study. Knowledge sharing has been researched in the context of worker communication (Gorry, 2008), Information Technology (Villasana, 2012), academia (Messeni Petruzzelli, 2008; Fullwood, Rowley and Delbridge, 2013), health (Bate and Robert, 2003a), emergency services (Seba, Rowley and Delbridge, 2012), and knowledge sharing networks (Willem and Buelens, 2007).

Fifty-five articles since 2000 have mentioned reform in the public sector, and these range from reform through an increase in knowledge sharing (Celino and Concilio, 2006), to the awareness of tacit knowledge as a precursor to learning and successful reform (Salleh *et al.*, 2013), to educational reform (Kakabadse, Kouzmin and Kakabadse, 2001), and reform initiatives suggested as a result of direct comparison to the private sector (Chawla and Joshi, 2010a).

2.20.1 Public Sector Knowledge Loss

Knowledge loss is intrinsically linked to individual employees as it is generally believed to be congruent with the expenditure involved in replacing not only the employee but the knowledge they hold (Eugene Jennex, 2014). There is usually a large outlay for an organisation in replacing workers (Drucker, 2006), who have left due to retirement, resignation, or transfer.

One of the major challenges facing the public sector today is the issue of employee loss. Whilst not specific to the public sector, the fact that knowledge as an organisational asset has to be protected is of critical importance. This protection stems from the requirement to protect intellectual assets and capital (Choo and Bontis, 2002).

The knowledge (particularly tacit) that is synonymous with personal experience leaves the organisation with the retirement or transfer of personnel. In the public sector in particular, the health service (globally) is facing a crisis of expert personnel shortages (Morgan, 2005). One of the key challenges for the modern public sector is how to capture knowledge in an ageing workforce (Jain, 2009), and how to retain the intangible/tacit attributes that knowledge has once attempts are made to articulate it (Boateng, 2008).

2.20.2 Knowledge Retention in the Public Sector

Within organisations, knowledge transfer is paramount but in the public sector, this transfer of knowledge is particularly underexplored. Seba and Rowley suggest that UK police forces for example, the need to develop knowledge management strategies for managing both implicit and explicit knowledge and the processes associated with the transfer between these types of knowledge.

If knowledge is not retained, organisations will not be able to learn from past experiences and will have to continually reinvent the wheel, unless appropriate knowledge resides within the organisation and is easily accessible to the right people to enable them to do their jobs (Du Plessis, 2003).

Public Sector knowledge loss has been closely linked to the rationale behind calls for increased scrutiny and accountability. There have been calls for increased awareness and organisation of public sector information structures and management of tacit and explicit knowledge held by employees (McNabb and Barnowe, 2009). This is due to the anticipated high retirement figures across global public sectors in the next quarter of a century (Massaro *et al.*, 2015). It is therefore crucial to capture this knowledge before the departure of the relevant personnel (Tangaraja *et al.*, 2015).

There is also the issue of knowledge sharing being seen as a reduction in importance within individuals in the public sector (Chiem, 2001), and a lot of public sector employees view knowledge sharing as a loss of power in itself (Seba and Rowley, 2010). This can make for an interesting link between the phenomena of knowledge sharing, knowledge loss, and culture, which can act as a barrier to knowledge sharing (Yao, Kam and Chan, 2007).

2.21 The Role of the Individual in the Public Sector

Having examined the phenomenon of knowledge loss in the public sector, this chapter will now look at the specifics of individual knowledge holders and will examine the key differences between private and public sector employees with regard to knowledge. Individuals in the public sector differ from their private sector counterparts in a myriad of ways, including mandate, structure, hierarchies, accountability, and responsibility (Taylor, 2010).

In any organisation, the knowledge residing in the individuals that comprise it should be channelled, utilised and maximised in order for it to be effective. However, if people are not encouraged to share knowledge, this will not occur (Ardichvili, Page and Wentling, 2003). Motivation plays a key role in the decision of the individual to share knowledge (Amayah, 2013a), and this has to be set against organisational climate and structure which if conducive to knowledge sharing will be strong positive motivators (Zarraga and Bonache, 2003). In the public sector, it has been shown that the culture does have a moderating effect on knowledge sharing (Hooff and Ridder, 2004), as does the level of trust in the work-place (Dirks and Ferrin, 2001).

2.21.1 Perry and White's Model

Perry and White (1990) identified a classification of typical values that espouse public sector individual behaviour and reflect key public sector cultural and hierarchical norms;

Rational motives are based on individual utility maximisation

Normative behaviour is based on social values and norms

Affective motives are characterised by a desire and willingness to indulge in altruistic behaviour

Attraction to policymaking and commitment to public interest

It is not altogether correct, however, to assume that these behaviours are specific to the public sector. Private and not-for-profit organisations can also offer individuals the opportunity to behave pro-socially or altruistically (Perry and Hondeghem, 2008). Motivation aside, research suggests that the majority of public sector employees are oriented towards intrinsic rather than extrinsic reward (Taylor, 2010). Taking the knowledge that resides in individuals and making it accessible requires more than reward, however, it necessitates investment in individuals to ensure that they recognise the worth of their own knowledge and are able to contextualise it and be willing to share it with the organisation (Cong, Li-Hua and Stonehouse, 2007).

2.21.2 Benefits from KM for the Individual and the Organisation

The most important aspect of individual knowledge is the *recognition* of it, and as a consequence, the recognition of the ability of the holder to be able to share it. The promotion and identification of knowledge does not guarantee its sharing, what will greatly enhance it however, it is recognition of cultural structures, barriers and enhancements to knowledge sharing such as I.T systems, people, processes, leadership, and reward systems (Al-Alawi, Al-Marzooqi and Mohammed, 2007). Another key area is the *identification* of knowledge holders. The ability to recognise key knowledge holders and place them in positions of effectiveness is of paramount importance in the pursuance of knowledge objectives (Whelan and Carcary, 2011b).

Research has also explored knowledge sharing barriers which impede the transfer of knowledge among employees due to either organisational or individual hindrances. The main challenges include lack of management recognition, lack of reward for knowledge sharing behaviour, and inadequate organisational IT systems. On a personal level, lack of time, interaction and communications skills were observed as the most prevalent obstacles (Sandhu, Jain and Ahmad, 2011).

Analysis has shown that the public sector knowledge management benefits may occur at either the individual or organisational level. For individuals, a proper knowledge management paradigm could allow them to cultivate and enhance their skills by sharing knowledge with others and deriving learning experiences from them (Cong and Pandya, 2003). At the organisational level, there is increased output following improved performance of employees (Seba and Rowley, 2010).

2.21.3 The Role and Nature of Public Sector Workers

Drucker has suggested that knowledge is "*embodied in a person; created, augmented or improved by a person, applied by a person and used or misused by a person*" (Wright, 2005). Placing the individual at the heart of the knowledge creation process is essential as it forms a cycle of knowledge creation, transfer, dissemination, and repatriation (Gourlay, 2006a). Knowledge is created, interpreted, shared, and ultimately actioned upon by individuals, and through the experience gained in particular roles, individuals can become experts in particular fields.

In the public sector, knowledge-intensive organisations can benefit immensely from the proliferation of experts in health, education, the emergency services, and the military. The application of knowledge management principles can be unique to each area. however, and this can make knowledge sharing less relevant and more difficult in the public sector due to its multi-sectorial stance (Schulte, Sample and Travis, 2006).

2.21.4 Challenges to Sharing Knowledge in the Public Sector

Communities of practice and knowledge transfer systems have been suggested as facilitators which can enable collaboration in the public sector (Bordoloi and Islam, 2012), and some research has suggested that the transfer of knowledge within the public sector is *dependent* on the setting up of frameworks such as these. Thus, public sector agencies need to leverage the potency of knowledge frameworks in order to effectively facilitate knowledge diffusion (Addicott, McGivern and Ferlie, 2006). However, issues of knowledge hoarding (Delany and Donnell, 2005; Cong, Li-Hua and Stonehouse, 2007), and lack of communication and trust (Cong, Li-Hua and Stonehouse, 2007), have been cited as challenges to knowledge initiatives.

Reige (2005) has suggested that there are over thirty-six challenges to sharing knowledge and has stratified them according to individual, organisational and technological (Amayah, 2013a). Sharing knowledge notwithstanding, individual knowledge is "highly mobile", and this makes the importance of capturing it even more urgent as it is more protectable when it becomes corporate knowledge (J.-C. Spender, 2006b).

There are social constructs that are associated with "symbolic capital" which may accrue to an individual if he or she is perceived as a key knowledge asset (Schutte, Barkhuizen and Africa, 2014). This may make it difficult for an individual to share knowledge, and this difficulty is recognised as being more than a mere reluctance to share knowledge; it may go beyond reticence and becomes insular and synonymous with social status (Johnson and Bourdieu, 1993). This is particularly true of the public sector, where, in the absence of fiscal rewards, socio-cultural identity is seen as having a direct bearing on individual knowledge accumulation (Schutte, Barkhuizen and Africa, 2014).

2.22 Public Sector KM Taxonomic Framework

The next section of this chapter will discuss public sector knowledge management through a taxonomy proposed and published as a result of examining the literature. This taxonomy was published in 2019 in "Knowledge Management Research and Practice" (Volume 17, 2019, issue 1). It is comprised of six areas that have been discerned in the literature as being unique to the public sector. They are presented as follows;

Figure 5 Public Sector KM Taxonomic Framework

(Source; Compiled by Author)

2.22.1 Public Sector Culture

In the public sector, culture is seen as complex and often not supportive of initiatives that can lead to knowledge sharing and dissemination (Amayah, 2013b). Public sector culture is also linked to its structured hierarchical nature, formal processes of decision making, and bureaucratic tendencies (Parker and Bradley, 2000). Public sector knowledge has also been linked to the culture of "knowledge hoarding" (Syed-Ikhsan and Rowland, 2004).

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This has led to reticence in sharing knowledge (Edge, 2005b), and presents further challenges for management who wish to foster collaborative practices in public sector organisations (Sveiby and Simons, 2002).

Perhaps the strongest argument for the relationship between culture and knowledge management in the public sector lies in the fact that the literature is heavily influenced by it. This research has thus far uncovered more than fifty articles that suggest culture in the public sector is a predominant feature and one that can influence knowledge creation and sharing.

Some of the reasons for this lie in the complexity it presents to knowledge scholars. For example, the uniqueness of public sector structures coupled with the siloed insularity that emanates from disparate departments in different jurisdictions (Denner and Blackman, 2013), mean that large parts of the public sector are grounded in a "need to know" culture (Deverell and Burnett, 2012) which can act as an impediment to knowledge sharing.

The idea of culture and KM has also been highlighted by Bučková, who suggests that it has a direct bearing on knowledge sharing in the public sector, more specifically, collaboration, learning and development, and management buy-in (Bučková, 2015). Interestingly, Cranfield and Taylor contend that the culture in Higher Education Institutions supports diverse opinion and encourages thought formation and sharing. They further suggest that the "academic community should have a sharing culture."

Kuang and Marshall echo the collaborative theme of Jaroslova and suggest that public sector culture should "evolve" over time, which would result in a culture that is conducive to knowledge sharing. It has also been suggested that not only is knowledge sharing a pre-requisite to public sector progress; it should be "championed" within the public sector (Amayah, 2013b). This would result in a culture of knowledge sharing, which would cyclically feed the generation of knowledge (Riege and Lindsay, 2006).

The relationship between culture and knowledge sharing has also been found to be conducive to knowledge generation in a military context. This is interesting given the propensity of the military and security sections of the public sector to display autocratic control structures (Marlène *et al.*, 2005) which ironically are not based in the sharing of knowledge. The issue with culture in the public sector is that given its disparate nature, it tends to augur disparate cultures, even within similar sections, such as the US Navy and Air Force displaying "process driven cultures" while Marine and Army sections tending to be "more flexible to adapt to changing environments" (Jones and Mahon, 2012).

Gottschalk has also looked at police culture as a specific subset of culture in the public sector and its link with the concept of the "learning organisation". He contends that police culture has to be analysed vis a vis its relevance to police behaviour and practice, particularly in a leadership context (Glomseth, Gottschalk and Solli-Sæther, 2007). Christensen and Crank suggest that police culture (historically) has elements of "secrecy, self-protection and violence" (Christensen and Crank, 2001) and Filstad has also presented a framework for police culture which, it is suggested, will provide an understanding of how a policing organisation can become a learning one (Filstad and Gottschalk, 2010).

2.22.2 Accountability

The key to accountability lies in the premise that democratically elected representatives act in the interest of the people, and as a result of specific mandates (Przeworski and Stokes, 1999). To this end, the term *representation* can be used hand in hand with accountability as it is assumed that elected representatives will echo the voice of the electorate as a result of the mandate they have been given (Mill, 1861). Accountability or representation is one of the key attributes of the public sector and a topic that is seen as crucial to its existence (Perry and Rainey, 1988). Through effective policy initiation, politicians and public sector bodies attempt to transform policy into effective action, principally by way of knowledge led initiatives (Riege and Lindsay, 2006)

Accountability in the public sector is hierarchical in nature with a devolutionary aspect that flows from elected representatives to public sector managers and on to public sector workers (Mulgan, 2008). Political accountability can often bestow complication on public sector managers who have to be able to change direction or organisational edicts in response to changing political pressure. Thus, accountability in the public sector presents somewhat of a moving target, with controls and behaviour not just subject to public scrutiny, but political support (Scott, 2001).

Accountability and Mandate

Complex mandates make for goals that can be varied and intangible in nature, which can place pressures on public sector internal communication (Perry and Rainey, 1988). Accountability varies with mandate and is fundamentally different in the public sector than the private (Cong, Li-Hua and Stonehouse, 2007). This is perhaps why it is difficult to mirror private sector values in the public sector as it is not easy to find parallels with regard to public sector complexity and linkages (Perry and Wise, 1990).

This is not to say that accountability comparisons cannot be made (Seng, 2011), as obligations to report on progress and outcomes are a staple part of management remit in both public and private sectors (Bottomley, 2001). Research suggests however that accountability is more stringent in the private sector, and there is a suggestion that authority has mitigated the effects of accountability in the public sector as there is a case to be made for reducing the hierarchical structures inherent in public sector constructs (Chawla and Joshi, 2010a).

This level of complexity makes it difficult to apply knowledge management practices in the public sector as the reporting structures are complex and have the potential to change quickly and without warning (Edge, 2005a). The paradox of expectation in public sector knowledge management has also been highlighted, with societal pressures demanding more open communication as a result of increased knowledge awareness, but the rigid bureaucratic hierarchies mitigating against this (Riege and Lindsay, 2006).

2.22.3 Government Intervention

The rationale for government intervention in the public sector has been well documented and has presented some interesting arguments for public sector existence (Hughes, 2003). Some researchers have argued for a free market style public sector that can compete directly with the private sector, as the presence of government acts as a layer of abstraction between the public sector and its customer obligations (Musgrave, 1989). Others have argued for government intervention suggesting that the "market alone cannot perform all economic functions" (Hughes, 2003) and that the effective management of knowledge can provide governments with strategic advantage (Gaffoor and Cloete, 2010). It also bestows an onus on governments with regard to the optimisation of knowledge assets that accrue from the vast amounts of information gathered in the course of public service transactions (Schutte, Barkhuizen and Africa, 2014).

Government intervention in the public sector is all-encompassing, from policy formulation to specific policy direction, and it forms the nexus of public sector decision making (McNabb, 2007). Research has also indicated clear links between the success of knowledge management initiatives and government intervention, with the public sector widely regarded as being "knowledge-intensive", and "ideal" for interventions, particularly in the e-government area (Samiotis et al.). It is also vital for public sector areas to display proficiency around service delivery and public awareness, and this suggests a clear mandate for government intervention with regard to knowledge decision-making ability (Samiotis et al.).

2.22.4 Security and Provisioning

The public sector has a unique role to play in the provision of services to the public. To do this effectively, it must have entrusted to it many forms of personal data, from health records to housing register information, legal and personal information, educational history, employment and taxation records, legal records, welfare records, and business details. If the practicality of providing access to information from an on-line perspective is added to this (Sanchez and Fuentes, 2002), then by implication, the storage, retrieval, dissemination and integrity of this type of data is, by inference, one of the key responsibilities of the public sector (McNabb, 2007).

Policy implementation in the public sector also contains elements of security in terms of state records and information (Mulgan, 2008). Research has also indicated that managers in the public sector are more conscious of potential data leakage than their private sector counterparts (Khojasteh, 1993)

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It has also been suggested that the success of some knowledge management systems have depended solely on the ability of security paradigms, particularly in the healthcare industry (Lin, Yang and Chiou, 2013). Thus, there is an onus on public sector bodies to court awareness of knowledge management initiatives in order for security paradigms to be effective (Khilji and Roberts, 2013).

Access to sensitive military information, for example, can create another paradigmatic issue for public sector bodies as there is an inherent dualism both in the rigour of security of military knowledge and the security of the state the military force purports to represent (Marlène *et al.*, 2005). This also holds true for the police, where for example, data gathered by Gottschalk suggests information gathered in the context of a police investigation is subject to security paradigms born of legislative obligation, but also that of electronic threat from an IT perspective (Gottschalk, 2006b). The security factor is also something that also needs to be addressed in terms of a key public sector attribute, that of security of employment.

The public sector has traditionally been an advocate of the lifetime employment paradigm, and this has resulted in detailed cultural implications around individual's disposition to knowledge (Sharkie, 2005) and knowledge sharing. This has implications for organisational culture, and given the uniqueness of public sector culture, "knowledge hoarding." rather than "knowledge sharing" is the predominant public sector knowledge practice (Cong, Li-Hua and Stonehouse, 2007). The security of information has huge implications for the public sector, however, and this is exacerbated by this culture, as knowledge needs to be reused in order to enhance security (Lindemann, Schäfer and Koch, 2011).

2.22.5 Insularity

The difficulty for the public sector lies in the absence of suitable metrics to define, measure, and contextualise its productivity, knowledge ability, and managerial sub-contexts. This is due to its unique or insular stance (Bryson and Crosby, 2014) which has been documented as being centralised, rule-oriented, and overly bureaucratic, as well as focused and self-protecting (Hughes, 2003). Policy determination may contribute to this insularity as it is generally produced for public sector implementation (Mercer *et al.*, 2005a). Historically, bureaucratically viewing the public sector as insular is something that has contributed to the lack of research in the area when compared to the private sector (Massaro *et al.*, 2015). To date, this research has uncovered just fewer than two hundred articles that are directly related to public sector knowledge management, as opposed to over two thousand in the private sector.

Insular thinking in the public sector can manifest in a "siloed" mentality, even between disparate public sector departments (Evans, 2012), and can also lead to a failure to recognise outside comparisons, concerns, or shifts in market or societal demands (Mercer *et al.*, 2005b). There are also cases where insularity is necessary, for example to protect sensitive information, or criminal & crime details during investigations (Tong, 2005). Conversely, there are cases where working insularly can be counterproductive to some aspects of criminal investigations (Lindsay, Cooke and Jackson, 2009). Knowledge management paradigms in the public sector can be difficult to implement due to their insular nature, even between specific sections, where the needs and demands for knowledge are entirely different (Gottschalk, Holgersson and Karlsen, 2009).

2.22.6 New Public Management (NPM)

New Public Management encompasses a set of statements, assumptions, targets, and conceptions about public sector organisations, designed around how they should be led and operated (Diefenbach, 2009; Vukonjanski, Vasilijević and Miti, 2018). At the core of NPM is a set of ideals that are aimed at bringing the public sector in line with the private sector and incorporating private sector market values and demand cycles via cost-effectiveness, performance and accountability improvements (Deem, 2004; Gruening, Gernod (Arbeitsbereich Public Management, 2001).

The concept of "New Public Management" dates back to the 1970s (Wilenski, 1988; Clarke and Clegg, 1999) and according to Diefenbach (2009), the premise behind NPM is that public sector organisations should become more knowledge-oriented, be able to deal with market-driven pressures (Ellis, 1998) and compete with the private sector in a business-oriented manner (Newton, 2003).

New Public Management encompasses the following attributes;

1. It has been introduced across all public sector sections, governmental, local government, higher education institutions, health services, criminal justice systems, police forces, the military, legal, and public service sections (Kirkpatrick, Ackroyd and Walker, 2005).

2. New Public Management is global in its reach and has been adopted in public sector organisations across Europe, the USA and Canada, Australia and New Zealand, Asia, and Africa (Mascarenhas, 1993; Haque, 1999). Table 8 is presented in order to provide a succinct breakdown of the major issues in NPM so the reader can conduct further research in the area if necessary.

Table 8 New Public Management

Business Area	NPM Objective
Business environment and strategic objectives	• Assumption of strong external pressure, of a much more challenging and changing business environment. • Conclusion that there is a need for a new strategy and that there is no alternative for the organisation but to change according to larger trends and economic forces. • Market orientation, commodification of services under the slogan of "value for money". • Stakeholder orientation, meeting the objectives and policies of strong external stakeholders. • Cost-reduction, downsizing, competitive tendering, outsourcing, privatisation of services.
Organisation Structures and Processes	• Decentralization and re-organisation of organisational units, more flexible structures, less hierarchy. • Concentration on processes, that is, intensification of internal cross- boundary collaboration, faster decision-making processes and putting things into action. • Standardisation and formalisation of strategic and operational management through widely accepted management concepts.
Performance Management and Measuring Systems	• Systematic, regular and comprehensive capturing, measurement, monitoring and assessment of crucial aspects of organisational and individual performance through explicit targets, standards, performance indicators, measurement and control systems. • Positive consequences for the people working with and under such systems such as increased efficiency, productivity and quality, higher performance and motivation.
Management and Managers	• Establishment of a 'management culture': management is defined as a separate and distinct organisational function, creation of (new types of) managerial posts and positions, emphasizing the primacy of management compared to all other activities and competencies. • Managers are defined as the only group and individuals who carry out managerial functions.
Employees and Corporate Culture	• Empowerment, and subsidiary staff are expected to develop 'business- like', if not entrepreneurial, attitudes. • Idea of leadership and a new corporate culture.

(Diefenback, 2009)

Two key tenets underpinning the ethos of NPM are increases in "efficiency and productivity" and "cost-effectiveness" (Diefenbach, 2009). New public management is also concerned with increased levels of productivity in the public sector. This is essential for KM initiatives if they are to be successful and if the public sector is to be successfully aligned with the private sector in terms of market-driven expectation and economic competition.

2.23 Knowledge measurement in the public sector

Having discussed a wide range of metrics for measuring knowledge, the next section will focus on issues of measuring knowledge in a public sector context. Given the established nuances of the public sector, it is not surprising that certain metrics have to be adopted or adapted to illustrate ways of measuring its performance in a knowledge context.

Given, as mentioned, the specifics of the public sector, the suitability of intangible measurement is of importance. This is relevant for instance, when discussing the difficulty in measuring non- profit driven enterprises. The IC scorecard methodologies previously discussed can form a "bridge" between private and public sector knowledge management by focusing on efficiencies and effectiveness. The key differences lie in public sector nuances described in this chapter, which form a nexus of specificity that make public sector knowledge management unique, and, commensurately (or antecedently), the measurement of that knowledge, particularly on an individual basis.

The provision of oversight, for example, to scrutinise increased performance and accountability in the private sector by way of performance metrics such as profit, sales, and expenditure (Massingham, 2014), is echoed to some extent by the provision of scrutiny in the public sector by way of new public management (Patrick and French, 2012).

Fiscal indicators that are effective in the private sector still have to be conjoined with knowledge management processes in order to account for the intangibility of metrics such as "value" and "organisational performance" (Massingham and Massingham, 2014a), in a co-variate type analysis where the constant is the relatively stable financial metrics and the variate is the, and as a result the measurement of knowledge is a more complex process. intangible result from knowledge-driven practices. However, fiscal indicators are not as relevant in the public sector as it is driven essentially by societal mandate (Wiig, 2002)

2.24 IC Methodologies

The IC methodologies discussed are eminently more suitable to public sector knowledge measurement as they focus on the intangible nature of knowledge and how it can be assessed or "packaged" (Stewart, 2007). However, given public sector specifics, knowledge measurement in the public sector has to be assessed against issues such as service delivery and exchequer mandate (Cong and Pandya, 2003b). A key assumption is that the intangible nature of knowledge remains a relative constant, whether it is measured against fiscal processes, service delivery orientation, and/or governmental mandate.

The absence of suitable metrics to define knowledge assets in the public sector are evident; however, they do not rule out direct comparison with the private sector, rather they serve to reduce the pace of efforts to measure it effectively (Bryson and Crosby, 2014). Awareness of social, ethical, and environmental consciousness, for example, is currently en-vogue in both private and public sectors, however, private sector organisations see this primarily as an expense, whereas the public sector approach to this phenomenon is generally guided by societal mandate (Da Conceição Marques, 2005).

Intellectual capital methodologies, as mentioned, have been used to measure knowledge output in the private sector with a relative degree of success, primarily because they attempt to cater to its intangible nature, or, more specifically, the elements of causality that cause it to be intangible, including, for example, value creation (Lev and Daum, 2004). However, the variant nature of IC methodologies lend the most relevance to the public sector in terms of their ability to capture its knowledge output. For example, structural capital, as defined by Santos Rodrigues, examines the "knowledge, skills, experience, and information" used throughout an organisation, and acts as a foundational structure for human capital planning (Edvinsson and Malone, 1997). This sense of creating a "value" of human capital planning

does not refer to specific metrics, rather, a need to cater to the intangibility of human capital measurement, which is essential in public sector analysis.

Relational capital refers to a systematic view of an organisation and primarily an outward interactional stance, which (in the case of the public sector) invariably entails knowledge generation through systemic interaction with private sector organisations. However, if there is no perceived value in this interaction, the principle of negative entropy, which can prevail which can result in stasis, with no tangible benefit. This is why new public management and general reform of the public sector has been heralded as a much-needed paradigm in order to ensure that this transaction does occur to the benefit of both (Katz and Kahn, 1978). Siddiquee suggests that this "bridge" between public and private can be reduced by applying public sector values to the public sector, including de-layering, outsourcing, and increasing opportunities for privatisation (Siddiquee, 2010).

Human capital is perhaps the most important aspect of the IC environment, as it is crucial in order to get a sense of human ability in all of its forms, capability, ingenuity, and cognitive awareness (Bontis and Dragonetti, 1999). This essential element of IC measurement, from a public sector perspective, is crucial, as it reflects, according to Niven, one of the crucial areas that accrue to a high "yield" in terms of productivity (Niven, 2011). Niven also suggests that there is a positive correlation in the public sector between performance and overall goal attainment. This would suggest that optimising human capital; particularly in terms of knowledge generation is a specific attribute that can lead to public sector performance improvement.

2.25 Key differences in Knowledge Measurement between Public and Private Sector

The key differences between the public and private sectors have been well documented in the literature. In relation to knowledge measurement, the baseline metrics in the private sector are evident, particularly in relation to fiscal methodologies such as profit, sales, return on capital and investment, etc. These imbue the private sector with tangible relative values with which to measure the relative *intangible* nature of knowledge against, and at least, in part, allow for a measure of the success of knowledge and knowledge management initiatives.

Goal alignment, therefore, principally by way of strategy, is a natural similarity between the public and private sectors, however; goal *outcome* is almost diametrically opposite (Mitre-Hernández *et al.*, 2015). This is where the knowledge management measurement paradigms used in the public sector divert from the private sector, however there have been attempts to measure their effectiveness in terms of decreases in crime, reductions inpatient waiting lists, and decreases in ambiguity and inefficiency in government services (Tung and Rieck, 2005). These measures can have a commensurate effect on public acuity as the public perceive faster and more efficient bureaucratic processes and confidence in governmental initiatives rise as a result (Vittal S Anantatmula and Kanungo, 2010; Mbhalati, 2013).

New public management, for example, continues to attempt to measure public sector performance by way of accountability and the application of quantitative metrics to public sector. These include tracking spending patterns and increases in accountability, by engaging in more processes designed to measure increases in efficiencies such as crime statistics, employee engagement, energy certification and purposeful goals (Patrick and French, 2012).

2.25.1 Creating Knowledge

Given all of the intrinsic and extrinsic nuances specific to the public sector, and the dearth of research in individual knowledge, it is contended that the *measurement* of its knowledge initiatives lie at the heart of the maximisation of its knowledge return (Mc Evoy, Ragab and Arisha, 2018). Boudreau echoes the importance of knowledge measurement by stating that knowledge measurement articulates and strengthens the "connection between knowledge and competitive advantage" (Boudreau, 2002). Creating knowledge does not allow for the maximisation of its potential effect (Boudreau and Ramstad, 1997). However, it does serve as a marker for efficiency gains and increases in knowledge awareness, which is at the heart of public sector reform initiatives and continues to drive it towards a "results" oriented state which engenders not only cultural change but superiority in service delivery and performance oriented budgeting (Siddiquee, 2010).

2.26 The literature on Public Sector Knowledge Management Initiatives

The literature on public sector knowledge management, whilst sparse in comparison to the private sector, does comprise of a variety of suggestions, appraisals, and recommendations for knowledge. For example, Cong and Pandya have examined a conceptual KM framework for the public sector based on three elements, people, processes, and technology. They have also suggested that in order to bring about change, awareness of the benefits of knowledge management must be increased in conjunction with a more caring culture, leadership advancement, and a remuneration paradigm that encompasses knowledge sharing (Cong and Pandya, 2003a). Koolmees has examined the idea of a "knowledge management scan" which focuses on external environmental interaction (ostensibly with and between private and public sectors) and also suggests the idea of a knowledge-sharing platform in the public sector coupled with the increased use of IT resources (Koolmees, Smeijsters and Schoenmakers, 2008), to measure the effectiveness of knowledge management.

Parker and Bradley have proposed a survey instrument to investigate public sector culture, and this has looked at change that has been brought about by reform in the Australian Public Sector, principally by the implementation of new public management paradigms. But this does not present an overarching process with which to measure public sector efficiency improvement (Parker and Bradley, 2000).

Girard and Mc Intyre have looked at public sector knowledge measurement by utilising an existing framework titled the "Inukshuk" framework, which is a Canadian model for KM. They have adapted it for public sector use in conjunction with the seminal "SECI" model proposed by Nonaka and Takeuchi (1995).

As one would expect, the SECI model has been adapted for public sector use and as a measurement for public sector knowledge management rationale by several authors, including Mir and Rohamen (2003), Oluikpe, (2012), and Sindakis (2015).

The "service delivery" dimension of the public sector has also been the subject of research into measuring the effectiveness of knowledge management, for example, Laihonen and Silanpaa (2014) have investigated process measuring measures to assess the effectiveness of public welfare services. This process approach is also echoed by Jing (2012), who merges two models; one of supply chain and one of KM, to improve the quality of KM design.

The education environment has also reflected several authors' attempts to measure public sector KM. The formative and summative assessment criteria used to measure educative progress can be "mapped" on to knowledge practices perhaps more easily than in areas such as law enforcement, security or governmental mandate. For example, Ranjan has proposed a framework to study the parallel issues of knowledge sharing and the design of educational materials in higher-level education. Metaxiotis has discussed the value of HCI (Human Computer Interaction) and its applicability to KM, and puts forward the idea of educative institutions benefitting from increased KM applicability.

In an overall context, Zeppou has proposed the use of the "MATE" (Management, Training, and Evaluation) to inculcate strategic management processes and measure effectiveness vis a vis specific NPM goals such as increasing staffing levels, levels of flexibility and training, and overall accountability. Amayah has studied the effect of culture on knowledge sharing, rewards, and motivation in the public sector and found that knowledge sharing will aid performance if a conducive environment exists or is developed through positive cultural practice (Amayah, 2013a).

It is evident from the literature that knowledge and knowledge management, particularly in the public sector, is complex, (Massaro, Dumay and Garlatti, 2015). What the literature has indicated is that in order to frame any context around knowledge, it must first be understood (Gibson, Wallace and Douglas Kreis, 2018), and the value of it expressed, not just in specific known measurement parameters (Chawla and Joshi, 2010b), but in terms of its ability to affect service delivery (Kloot and Martin, 2000).

The value of knowledge in the public sector, therefore, and its effectiveness, both from an access and measurement perspective, is clearly under-researched, and the necessity to bring understanding to this area is clear, both to interpret performance and add relevance to strategy and strategic imperatives (Oluikpe, 2012b).

Conclusion

In order to provide a comprehensive appraisal of the literature, it has been necessary to illustrate the specifics of public sector knowledge and knowledge management from a number of perspectives. That of the individual, the public sector as an entity, and from there, the key differences and similarities between the public and private sector. However, this chapter goes further in providing a peer-reviewed, published taxonomical framework on public sector knowledge management which will assist in further research and adds to the extant literature on the topic. Having laid the foundation for police knowledge and knowledge management, this chapter will conclude with a detailed appraisal of the literature, which is albeit, relatively sparse on the subject.

2.27 Police Knowledge and Knowledge Management

As this research is primarily concerned with discerning the value of knowledge/knowledge management in law enforcement, it is prudent at this juncture to examine the literature as it pertains to policing and the public sector.

The literature is clear on the role of knowledge and knowledge in the public sector, and this review has uncovered a relative lack of public sector knowledge management literature in relation to law enforcement, as the onus appears to be on continual change, restructuring, and continual development (Davies and Thomas, 2003). Whilst knowledge is presented as an integral part of this development, it is part of an overall strategic imperative in a lot of police forces, which encompasses reform at a variety of levels.

Having examined the literature relating to knowledge, knowledge measurement and management, and the public sector in general, it has "set the scene," so to speak, for an examination of the nuances that pertain to law enforcement and law enforcement knowledge. Police knowledge and the management of it is complex for myriad reasons (Lacey *et al.*, 2012), including the necessity and complexity of international co-operation vis a vis geographical boundaries and international police accords (Lacey *et al.*, 2012),. The reciprocity of knowledge sharing that can lead to investigative success (Exchange and Report, 2018) and Eppler has examined the necessity for knowledge co-ordination coupled with time demands and ambiguity (Eppler and Pfister, 2014).

This is aside from public sector specifics that have been documented in this work. However, in order to answer and examine the research question and objectives, it is imperative to contextualise the nuances of police knowledge, even though there is a relative lack of research around the topic as compared to other public sector entities.

2.28 Categories of Police Knowledge

Making knowledge a "value" proposition has been proposed as one of its main attributes, and the ability to see knowledge as a process is essential to an understanding of its context and its value (Crawford, 2005). In policing terms, this can encompass knowledge as a subset of service delivery, and within this area, knowledge is hugely diverse, for example, Bertot posits that service delivery is as much to do with the specifics of the content as it is to with the context in which it is delivered (Bertot, Estevez and Janowski, 2016; Basilio, Brum and Pereira, 2020).

This is especially true of law enforcement, where service delivery can be as diverse as the mandate for policing, which can include elements of social work, child protection, dispute resolution, counselling, and reactive judgement. All of these attributes are aside from the obvious mandates of crime detection and prevention, and all must be taken into consideration in the context of knowledge, particularly, tacit knowledge (Nordin, Pauleen and Gorman, 2009a). For example, the London Metropolitan police have cited mobilisation, the embracing of technology, efficiency, value for money, building public confidence and of course legislative interpretation amongst the many components of its mission, which illustrates the levels of complexity around police aspirations ('The Met's Direction : Our Strategy 2018-2025 Contents', 2018).

To situate knowledge in terms of value, it is imperative (in a policing context) that it is contextualised in terms of the propensity to share it (Gottschalk, 2006b). This is especially true in a policing context, where for example, it may be crucial to retain knowledge in tacit form, as it may hinder an investigation or compromise a situation to articulate it (Nordin, Pauleen and Gorman, 2009a).

However, a dichotomous position on tacit knowledge can easily ensue where it is prudent and possibly essential to articulate tacit knowledge (in an investigative context) in order to gather all the information possible about a criminal investigation in order that it leads to a successful outcome (Dean, Filstad and Gottschalk, 2006).

However, the cognitive dissonance which could be articulated between tacit and explicit knowledge is at the heart of effective police work and can result in an effective and successful investigation. Therefore, it must be specified in order to be effective (Seba and Rowley, 2010). The value of knowledge in a policing context therefore can be as complex as the investigative practices that are followed, the complex public sector mandates that surround a typical policing organisation, and the interpretation of legal and policy requirement which can happen to a greater or lesser extent depending on the potential urgency and pressure of the investigation (Dean, Fahsing and Gottschalk, 2006)

Knowledge as value in terms of police work has also been articulated in terms of its "multifaceted approach" (Dean and Gottschalk, 2007). This would suggest that expressing value in terms of a singularity (where knowledge is concerned) is extremely difficult and complex. For example, to attempt to offer a set of robust suggestions that would lead to an assessment of the knowledge contribution in a law enforcement agency entails detailing knowledge in context and in parallel with management initiatives, organisational processes, technical ability, interactive ability, and networking competence (Dean and Gottschalk, 2007)

Gottschalk has described a "network of policing knowledge" that reflects the complexity and the breadth of potential knowledge ability that a police officer could possess, and this is illustrated in figure 7. However, this does not include issues such as the complex mandate that would come from governmental and societal pressures, and also the value and relevance of proper training and educational paradigms (Caparini and Osland, 2017).

This should emanate from the recognition that people need specific knowledge in training, and this can be delivered via relevant knowledge paradigms (Al-Rahmi *et al.*, 2019)

In discussing value in a policing context, therefore, it is important to detail the potentially different interpretations of the term itself. The "value" that a police service delivers is somewhat different from the "values" that a police service holds; for example, values and beliefs are precursors to communication from which knowledge can be of enormous benefit (Fairlie, 1901). However, the idea of a mission-critical paradigm or a mission statement which is designed to install a sense of "value" in service delivery to the public can be encapsulated in a simple statement, such as "to serve and to protect" (NYPD). This can be a motivator in some cases, but its knowledge value can be negligible in the wider context, except perhaps to be internally motivating in focusing people on the transition from medium to long term goals (Ali *et al.*, 2019).

Police knowledge is mired in processes and intrinsically linked to other public sector paradigms such as accountability, governmental mandate, and service delivery (Wakefield, 2008). This is also true of legal interpretation and the knowledge needed to understand and interpret a wide range of criminal legislation. However, it does not follow that interpretation of legislation will necessarily improve service delivery to the public (Fleming, 2008). This can be attributable to the rigidity of legal frameworks and the fact that service delivery is bound by much more than legal interpretation, particularly in a policing context (Filstad and Gottschalk, 2010).

Moreover, the literature refers to service delivery in the context of policing by suggesting that police officers are typically "knowledge workers" and that public service requires this by requiring police officers to display a high degree of competence (Richardsen, Burke and Martinussen, 2006). Tong, 2005, specified personal attributes that were considered to be vital

to effective detective work, and these included not only legal knowledge but practical and personal knowledge and knowledge of rules and procedures, not only legislative but internal and promoted by mandate (Vickers and Kouzmin, 2001).

The traditional view of policing in terms of processes has been couched in public sector attributes of authoritarianism, hierarchical decision making, and potential disciplinary action if processes are not adhered to (Murray, 1987). However, these processes can and are often at odds with the processes that are brought to bear on criminal investigations, which has been illustrated as a methodological way of thinking (Dean, 2005). This has led to some confusion in relation to accountability as it can be situated in different areas depending on the status and stage of an investigation (Gottschalk, 2006b). For example, it is imperative that different types of knowledge are utilised at different stages of an investigation, and this is articulated in figure six below, which has been adapted from Gottschalk's knowledge management systems stage model.

Figure 6 Types of knowledge at varying stages of police investigation
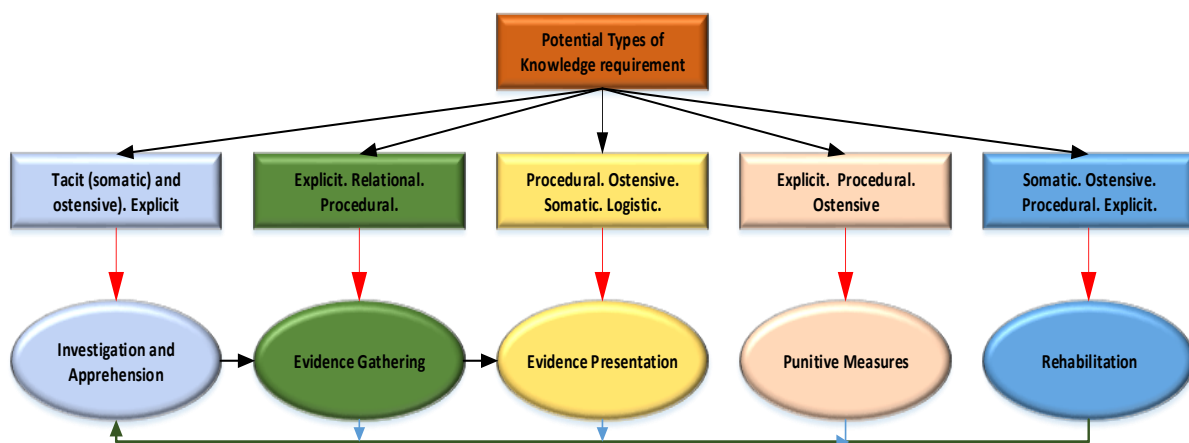
(Source; adapted by author from Gottschalk KM Systems Stage Model)

There are three key issues in relation to this; the first is that the knowledge represented in this "process" is only a part of the overall knowledge utilisation in policing. For example, in this linear representation of knowledge "flow" in a criminal investigation, the knowledge utilised

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could be suggested as being "front end" knowledge. This is the knowledge that the public sees and represents the public face of policing. This knowledge, however, comes from "context" (Gibson, Wallace and Douglas Kreis, 2018), and this "context-specific" knowledge is not indicative of police procedures, resource allocation and crime preventative methodologies.

The second is that policing in this process relies on an effective "handover" of knowledge through to the stages of punitive punishment and possible rehabilitation. These, while precipitated by effective policing measures, are not necessarily policing matters directly, yet they rely on an effective policing knowledge foundation to secure a conviction. This, for example, means the utilisation of effective knowledge transfer and knowledge expertise to ensure the process can come to a robust conclusion even through to potential positive rehabilitation (McNeill, 2012).

The third issue is the issue of technology. Technology has an interesting role to play in policing as it is utilised comprehensively in terms of its ability to assist policing and amalgamate policing practice with the judiciary, the penal system, and social services. Gottschalk contends that policing and technology are becoming more adept at leveraging knowledge as each becomes more dependent on the other (Gottschalk, 2006a).

In fact, Gottschalk has proposed a four-stage model of knowledge management and technology with various stages involving the availability of knowledge as a tool to assist in identifying who knows what and what people know in an organisation. This, Gottschalk contends, will allow for greater utilisation of technology throughout an organisation, and in the context of policing, a focus on data will allow for more relevant use of technology in investigative procedures, and knowledge transfer and sharing will assist in streamlining investigative practices (Gottschalk, 2006a).

Technology is now a major player in policing, and with the advent of global policing, it is a major contributor to national and international collaborative practices in law enforcement. However, it must also be recognised as an ongoing cost, and in the case of An Garda Síochána, it ranks as the highest financial outlay next to salaries (Gavin, 2018). The use of technology has social implications, both for policing and for the public and the interaction between both, with the usage of social media being a major contributor to social sentiment, support, and engagement ('The Met's Direction : Our Strategy 2018-2025 Contents', 2018).

Figure 7 Typical Police Knowledge Values
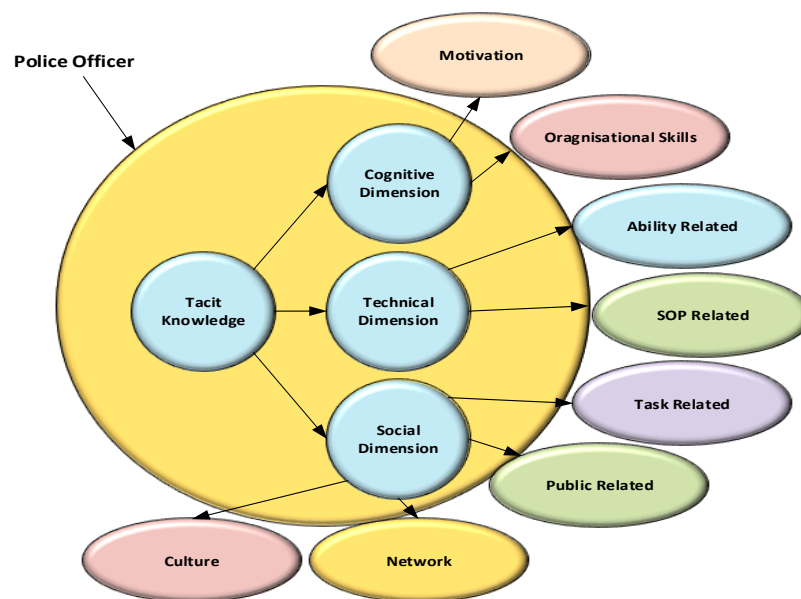
(Source; Gottshcalk, Knowledge Management in Policing and Law Enforcement)

2.29 Five Conceptions of "Knowledge" Policing

The complexity of policing would suggest that culture and knowledge alone make policing an ideal subject for research, and Gottschalk has suggested that there are "five conceptions of knowledge" with regard to policing and that these shape the way in which policing views knowledge (Dean and Gottschalk, 2007). These "conceptions" are

1. *Knowledge as value*

2. *Knowledge as exchange*

3. *Knowledge as a resource*

4. *Organisational Knowledge*

5. *Knowledge as a strategy*

Knowledge as value

In relation to this area, Gottschalk suggests that knowledge is irrelevant unless it adds value (Dean and Gottschalk, 2007). With tacit knowledge generally recognised as a key enabler or driver of knowledge initiatives (Barclay and Murray, 2000), it is essential that a return on any investment in it is articulated and made explicit (Vickers and Kouzmin, 2001). In other words, knowledge needs to create "value for money" (Ryan and Whelan, 1996).

This is echoed in the rhetoric of police forces around the world, for example, the London Metropolitan Police stating explicitly in their strategy document for 2018-2025 that they need to be "effective, efficient and offer value for money" ('The Met's Direction : Our Strategy 2018-2025 Contents', 2018). The Los Angeles Police Department has also clearly articulated the requirement for requisite knowledge by stating that only specific training that targets core knowledge mixed with relevant experience can offer value in the shape of "police knowledge and skills" (LAPD Manual On-Line, Volume 1).

However, knowledge value in a policing context also has other interesting contexts, with the conception of crime and criminal organisations also offering "value" creating activities. For example, their propensity to offer an existence to counteractive organisations such as Interpol, the FBI and the CIA, and Europol (Dean and Gottschalk, 2007).

Knowledge, therefore, in a policing context can have value propositions along a range of continuums, specifically in the investigative arena, the management area, the correlation of crime and the resources needed to combat it, and the metrics of any large public sector organisational structure (Stabell and Fjeldstad, 1998; Dean and Gottschalk, 2007). However, this research will attempt to look at a knowledge management solution at a policing level in order to afford a more generalisable solution to the research question and objectives. To this end, the attributes discussed in chapter two will have resonance, as they are specific to other sectors such as health, education, and local government, and yet are fundamental to the public sector.

Knowledge as exchange

In chapter 2, this research discussed the concept of knowledge "flow" and the dichotomous stance that this reflects, i.e., whether or not the flow of knowledge in an organisation is predicated primarily on the actions of the individual or the collective (Atherton, 2012). However, in order to promote the exchange of knowledge, two issues must be discussed. The first is the transactional nature of knowledge, whereby it needs to be viewed as a commodity, not just to be shared or transferred, but "exchanged", essentially for more knowledge or information, (Connell, Klein and Meyer, 2004), which can then be utilised in the form of (in the case of policing) relevant information to aid investigative practices (Dean and Gottschalk, 2007).

The second is the fact that knowledge *needs* to be transactional in order to flourish and to be thought of as "commercial" in nature (Earl, 2001). Gottschalk discusses police KM in the context of knowledge exploitation, specifically in the investigative arena, where it is imperative that knowledge is used to analyse crime (prevention and detection). Gottschalk makes a case for the "knowledge is power" paradigm as he suggests that this is an important aspect of police investigative work both in the context of privileged information and its potential utilisation as a "bargaining chip" in investigations (Dean and Gottschalk, 2007).

Research conducted into police knowledge sharing has suggested that training and culture have a role to play in the successful exchange of police knowledge, and importantly, that previous research into police knowledge sharing has been confined mainly to areas around intelligence and crime (Griffiths *et al.*, 2016).

This research diverges from this focus and will look at the concept of knowledge as a systemic issue which will make it more generalisable to the public sector as a whole. The literature is relatively clear on the systemic nature of knowledge in that it points to it as one of the pillars of knowledge management (ALAVI, KAYWORTH and LEIDNER, 2006; Huang *et al.*, 2011). However, dealing with the issue of knowledge as a precursor to its specific applicability, whether it is in criminal investigations, governmental policy initiatives, or health procedures will make any suggestions offered more applicable to a broader range of recipients.

Knowledge as a resource

Knowledge as a "resource" has been well documented in the literature (Eppler, 2008; Huang *et al.*, 2011). The knowledge-based view of the firm (Grant, 1996) suggests that knowledge needs to be aggregated in order to form a coherent proposition and to enable it to be identified as a resource so its potential as an organisational attribute can be maximised. This in turn, leads to the question of its absorptive capacity (Cohen and Levinthal, 1990) who suggest that new knowledge needs to be absorbed in order to add to its efficacy, and ultimately to its practicality as a resource.

In terms of policing, Gottschalk suggests that in order for knowledge to be treated as a resource, it must be identified as such, and its potential variances also identified, which suggests that it can be exploited effectively its applicability is recognised (Dean and Gottschalk, 2007). For example, knowledge that can be used to exploit more effective policing is not necessarily the same knowledge that is needed when interviewing a potential suspect.

Treating knowledge as a resource allows for some analysis to be undertaken, for example, in Norwegian Law Enforcement, Gottschalk has undertaken a study with detectives to ascertain the strategic value of various knowledge resources. These revolve around the specifics of criminal investigations, such as the analyses of handwriting, pictures, and weapons, as well as forensic analysis of DNA and computer crime. This knowledge is then used to analyse crime trends and optimise resource allocation (Dean and Gottschalk, 2007). In An Garda Síochána, the Garda Analysis Service operates along similar lines, with knowledge generated from continual layers of analysis that are used to assist Garda management in optimising resources.

Organisational Knowledge

As discussed in the literature, organisational knowledge refers to the ability of an organisation to collectively utilise knowledge effectively (Roberts, 2015), principally through the use of structures, processes and collective practices, such as knowledge bases, intranets, and communities of practice (Dean and Gottschalk, 2007). In a purely policing context, it is easy to see that pooled knowledge resources can aid in investigative practices, and even beyond into legal interpretation, and court processes etc. From this, comparisons can be drawn between police investigative collaboration and communities of practice (Dean and Gottschalk, 2007).

The ability to "problem-solve" is another key knowledge attribute in policing and on a number of levels. On one hand, the overarching issue of the solving of crime, staffing levels, deployment, resources, and collaboration with the public is at an organisational level and the one in which this research will concentrate primarily on. The reason for this is that it is contended that without effective knowledge management at this level, the specific examples of knowledge used in particular criminal investigation etc, will not have a suitable or robust foundation from which to inculcate the knowledge learned back into the organisation.

In relation to problem-solving, the London Metropolitan Police, for example, has stated that problem solving is something that they will "invest" in over the next couple of years. However this investment is mentioned in terms of collaboration with the community, safeguarding procedures, and the "signposting" of vulnerable people. The fact however, that these are relatively intangible goals reflects the intangible nature of knowledge and the levels of knowledge required to bring these goals to fruition. (London Met Business Plan 2018-2012).

The other level of problem-solving revolves, as mentioned, around specific policing procedures, for example, the problem of knife crime, drugs, domestic violence etc. with various police agencies vowing to eradicate these problems. This, as discussed, forms part of an overall knowledge solution rather than a specific knowledge problem.

At an organisational level, the transfer of knowledge can come about as a result of explicit or implicit processes, it is what is achieved with this knowledge, however, that can result in organisational benefit (Roberts, 2015), and from this the value of knowledge as an organisational attribute can be more effectively assessed (Nonaka and Takeuchi, 1995a; Dean and Gottschalk, 2007).

Knowledge as a Strategy

Representing or linking knowledge to strategy allows for it to be conceptualised in terms of an amalgamation of "systems, networks, knowledge repositories and IT tools" (Dean and Gottschalk, 2007). In terms of policing, there are distinct differences in how the terms "strategy" and "knowledge" are used.

For example, the NYPD (New York Police Department) have set their strategic imperatives at the level of operational crime and community engagement, which involves a commitment to increased collaboration with the public. The Australian Federal Police has published its strategy for 2017-2020, which focuses on criminal intelligence by utilising the ACIM (Australian Criminal Intelligence Model) to look at standardisation of information and knowledge sharing (https://www.afp.gov.au). The Royal Canadian Mounted Police (RCMP) Strategy is focused on intelligence gathering in order to increase the effectiveness of investigative practices http://www.rcmp-grc.gc.ca.

With regard to policing strategy, expertise and knowledge are inextricably linked. It is the application of this knowledge that can be seen as disparate, both in the resultant strategic direction of various police forces and the potential ambiguity that surrounds the application of knowledge at various levels (Dean, Fahsing and Gottschalk, 2006). This research, as well as recognising the dearth of research in knowledge in this sector, proposes a set of knowledge suggestions/solutions aimed at increasing communication and decreasing ambiguity (Kim, Nam-Hyeon (Keimyung University), Sohn, Dong-Won (Iaha University), Wall, James A. Jr. (University of Missouri *et al.*, 1999)(Kalling, 2003b), which in effect, could lead to more cohesive and coherent knowledge strategies.

2.30 Police Culture

According to Gottschalk, the complexity of knowledge in policing encompasses all of the above attributes (figure 7). However, as this research will show, from the inside of any policing organisational structure, pressure tends to emanate primarily from multi-sectorial mandate, which can inform all of the attributes in the above.

As these attributes primarily describe the context of knowledge from an individual policing perspective (Dean and Gottschalk, 2007), it is also prudent to further investigate how these can be inculcated back into organisational practice, thereby internalising these as potential future processes (Nonaka and Takeuchi, 1995a).

For example, the relationship between knowledge and training/education in policing is a somewhat synonymous topic that can lead to a certain degree of ambiguity around the key differences between "education" and "training" (Alegre, 2009). The London Metropolitan Police for example suggest that training should be oriented towards delivering "high-quality content" but this may not effectively translate to competent, knowledge-based policing.

Gottshchalk also suggests that the value derived from knowledge is pervasive in the service industry and anywhere where knowledge is seen as a flow process. This process moves from defining a problem to solving it and reflecting on its success, and it places an onus on the idea of the "effectiveness" of a knowledge solution being predicated essentially on the effectiveness of the processes that bring it into existence (Gottschalk, 2006b). The measurement, in this case, is retrospective evaluation, and Gottschalk further explains this in terms of a "knowledge exchange" approach. To extrapolate the value of this knowledge, however, and its effectiveness in policing is something that is necessary in order to produce a systemic knowledge paradigm for policing, which will be of value to policing and policing management in order to make it effective.

In a policing context, knowledge is exchanged for information, and this can lead to successful investigative practice, which in turn can lead to internal motivation resulting in career advancement, respect, and other intrinsic and extrinsic rewards (Dean and Gottschalk, 2007).

This measurement derives principally from direct metrics such as a reduction in crime figures and less reporting of crime; however, there is an intangible element to it insofar as the *prevention* of crime is concerned. This is a value supposition and can only be measured in conjunction with the direct analytical measurements mentioned, however, measurements such as these still remain difficult to contextualise (Dean and Gottschalk, 2007).

Police knowledge management, therefore, is a complex mix of substantive and subjective metrics, all of which can be utilised to form an understanding of its very complexity (Barton and Valero-Silva, 2013). In effect, police knowledge management is a multi-layered construct comprising a multi-agency and agentic approach from a myriad of partners, in conjunction with the motivation of law enforcement personnel themselves supported by effective training and support (Barton and Valero-Silva, 2013). This is also true insofar as the mandates that govern policing need to be coherent, otherwise, the knowledge that can emanate from these can result in compartmentalised knowledge practice, both at the front line and at managerial level (MacHold, 2020).

The purpose of this work is, in essence, to crystallise this approach from a pragmatic perspective and aim to imbue the outcomes with concrete and practical suggestions from which this complex knowledge structure can be understood and consequently made more effective.

2.31 Summary and Conclusions

Introduction

Perhaps the most interesting part about and knowledge and knowledge management in the public and the private sector in the literature is the duality of both its multifaceted approach and the fact that the human actor has a singular adaptive process to perform in the *rationalization* of knowledge. That is to *benefit* from it. This simplistic suggestion perhaps belies the complexity of the measurement methodologies that are proposed in the literature, but the rationalisation of this suggestion is that the individual is at the heart of knowledge generation and knowledge measurement. Therefore it should begin and end with the individual. Hence, for example, the success of the seminal "SECI" model (Nonaka et al. 1997).

Knowledge and knowledge management in policing is complex and requires elucidation because of its wide remit and multifaceted mandate (Barton and Valero-Silva, 2013). The literature suggests that policing would benefit from a pragmatic approach to knowledge as previous attempts (such as new public management), to introduce specific accountability and coherence have not been successful (Pollitt, 2000).

While it is clear from the literature that knowledge and knowledge value in policing is complex, it is also evident that the range of diverse topics and diverse fields that constitute policing (including knowledge requirements and expectation) (Holgersson, Gottschalk and Dean, 2008), have contributed to a lack of cohesion around policing knowledge (Griffiths *et al.*, 2016). There is a clear mandate to research knowledge and knowledge practices in this area, therefore, and attempt to bring clarity and cohesion through knowledge and knowledge management paradigms to this area.

This research, in proposing a set of knowledge solutions aimed at enhancing knowledge processes in the public sector, and more specifically, policing, will attempt to "situate" knowledge within these constructs, and illustrate that not only is it pertinent to maximise knowledge utility (Zyngier and Venkitachalam, 2011), but by implication, attempt to illustrate the practicalities and relevance of doing so on an individual basis.

The literature suggests that the very diverse and complex mandate of policing requires specific knowledge parameters, which can potentially make it more effective. There is an absence of an agreed stance on knowledge due to this complexity (Reiner and O'Connor, 2015), and police managers are potentially unclear about the potential benefits of coherent knowledge strategies in criminal investigations (Sherman, 2013).

Initial Findings

Initial findings of this research indicate that KM in the public sector is relatively under-researched compared with its private-sector counterpart. Despite the abundance of case studies within the literature, most research efforts are geared towards the development of applied individual frameworks to support public KM initiatives. Inducing cultural changes in public organisations and introducing mechanisms of accountability have also been revealed as imperative issues of importance in the context of KM. From an application perspective, most studies have been conducted within the education and healthcare organisations, with a scarcity of research in certain important government departments such as the police and armed forces. The key findings from this structured review are detailed in the next section of this chapter.

Key Findings

1. The public sector is generally viewed as exhibiting specific dynamics when it comes to KM.

2. Knowledge loss is a key factor in the public sector, and knowledge management can assist in minimising this phenomenon by identifying key areas for knowledge retention and utilising information technology to capture and codify knowledge.

3. There is a dearth of evidence on knowledge in key public sector areas such as the emergency services, police, fire service, and ambulance sectors, etc.

4. There is no discernible research into the identification of knowledge holders in the public sector and the measurement of knowledge loss therein.

5. The role of information technology in KM is well researched; however, there is relatively little research into the codification of knowledge in the public sector.

6. Government departments and reform account for the majority of research on knowledge management in the public sector, and this area covers government initiatives, productivity, and public sector reform.

7. The most researched sections on knowledge management in the public sector are the health and education sectors.

8. There is a discernible lack of evidence on the measurement of individual knowledge in the public sector.

9. There is a comparative lack of research on policing and knowledge and police knowledge management in the literature.

10. Policing knowledge is complex and encompasses organisational and inter-organisational dynamics that need to be set against more coherent knowledge solutions.

Conclusion

In relation to knowledge and knowledge management in the public sector, and in particular, in relation to policing, the literature is sparse (Griffiths *et al.*, 2016). This has much to do with access to the public sector's existing cloistered bureaucratical structures, which has led to difficulty in scholars gaining access in order to conduct research (Massaro *et al.*, 2015). What remains clear, however, are the gaps in the literature in relation to public sector knowledge management, knowledge management in the emergency services (such as fire and ambulance services, the military, and policing), (Gottschalk, Holgersson and Karlsen, 2009), and the potential effectiveness of same. In order to address this, the research questions have evolved from the attempt to not only gain access to a typical public sector organisation, but address this gap in the literature by evaluating and assessing knowledge and knowledge management practices in policing.

This will allow for specific appraisal of current knowledge practice from an insider perspective and thus allow for specific recommendations to be made in relation to knowledge and knowledge management, which can be utilised by not only AGS, but other police forces. The research questions that are presented for this work are uniquely positioned to take cognisance of this and allow for this exploratory work to be the foundation for more research that has been requested by AGS. This will imbue the findings with richness, rigour, and relevance.

Figure 8 Literature Review Schematic (Presented on the following page)
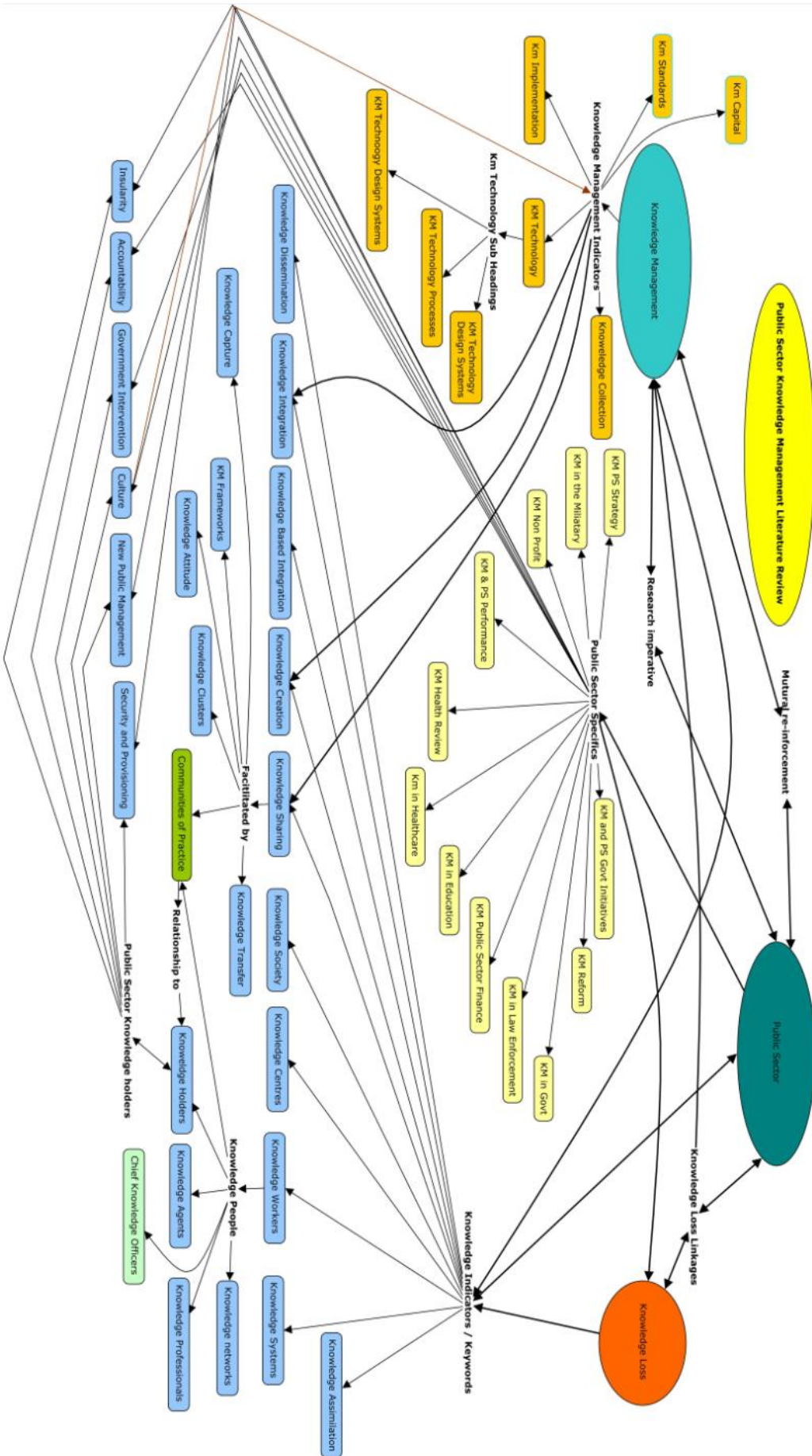
Chapter Three: AN GARDA SÍOCHÁNA

3.1 Introduction

This chapter presents a detailed breakdown of An Garda Síochána and frames the context for the research in terms of the case study. In positioning the organisation as a medium level police force, a comprehensive appraisal of the organisation is offered in order to contextualise its historical constructs, its current strengths, crime statistics, and illustrate comparative policing statistics on the international policing stage.

An Garda Síochána, in allowing this research unprecedented access to its personnel at all levels and mandating future research in order to bring knowledge to the fore in its strategic imperatives, has by implication engaged in the first of a series of reforms aimed at bringing knowledge constructs to bear in policing, moreover, testing their effectiveness in a real-world policing environment.

As the case study exemplar and in order to answer the research questions presented, it is necessary to frame an evaluation of knowledge and knowledge management in policing against a real-world medium-level policing organisation.

This opportunity has been presented as a result of the access gained to An Garda Síochána, the data that has been gathered, and the analysis process that has been undertaken in order to make foundationally rigorous recommendations, not only to the organisation itself, but to other, similar police forces who wish to make knowledge a keystone of their strategic plans.

An Garda Síochána

An Garda Síochána is the Irish (Gaelic) name for "Guardians of the Peace." This is the title given to the police force of the Republic of Ireland. It is a large public sector organisation employing approximately 17,000 people, consisting of 14000 police officers, 2,500 civilian staff, and 500 reserve police officers (figure 9). Staffing levels have not have changed substantially over the past seven to eight years, as can be seen in figure 9. The organisation's mission statement is "keeping people safe," and its remit is to "police by consent," which underpins its ethos as an unarmed police force. For specific details of the lineage, structure, and background to the organisation, please see appendices 7-10 inclusive.

3.2 Policing by Consent

An Garda Síochána has always been a police force that polices by consent. This effectively entails compliance with lawful instruction without the potentiality of the use of force to ensure capitulation. It is essentially "passive" acceptance of police authority (Dean, 1994), and has met with a large degree of acceptance in the Irish Republic. However, it is a tenuous issue as it hinges on societal acceptance of a policing presence, and society is prone to change on a continual basis. The ethos of policing by consent is not that society consents to have a police force (Dean, 1994); rather, that it consents to allow policing to operate and make decisions that affect people.

Policing by consent has its roots in the "Peelian Principles" which date back to 1829, and are still utilised in terms of their ability to provide a framework for what has been termed the "Anglo-American" policing model. More specifically, they suggest that policing cannot exist without public acceptance and that respect from the community has to be synonymous with co-operation. They also posit that proportionately, the reliance or requirement for the use of force diminishes in proportion to the amount of support or co-operation garnered from the public (Loader, 2016).

This may have the effect of introducing a socio-cultural or moral barometer when it comes to policing, however, it is not measured and is a tenuous link between perceived norm and societal mandate (Jackson, Bradford, *et al.*, 2012). For example, in the United States, the degree of social acceptance of policing and policing edicts depends on the propensity of law enforcement agencies to act either authoritatively or collaboratively, and this indicates that co-operation may be based on the perceived value of a policing service by the public (Sunshine and Tyler, 2003).

Policing by consent, however complicated, needs to be seen vicariously through the eyes of the public, as it is, as mentioned, as much perceived as realistic. The fact that An Garda Síochána "polices by consent" despite being 30% armed does not mean that it does not police with the will of the people. However, historically, this was seen as the "benchmark" for policing by consent and thus measured on the percentage or ratio of armed to unarmed officers. It is contended, however, that policing by consent should be equitable to policing legitimacy (Reiner, 2010).

Figure 9 An Garda Síochána Staffing levels 2010-2018

AN Garda Síochána Overall WORKFORCE 2010-2018

	2010	2011	2012	2013	2014	2015	2016	2017	2018
Garda	14377	13894	13424	13093	12799	12816	12943	13551	14032
Civilian	2099	2074	2028	2072	2055	2007	1999	2192	2430
Reserve	700	877	991	1164	1124	953	695	589	528
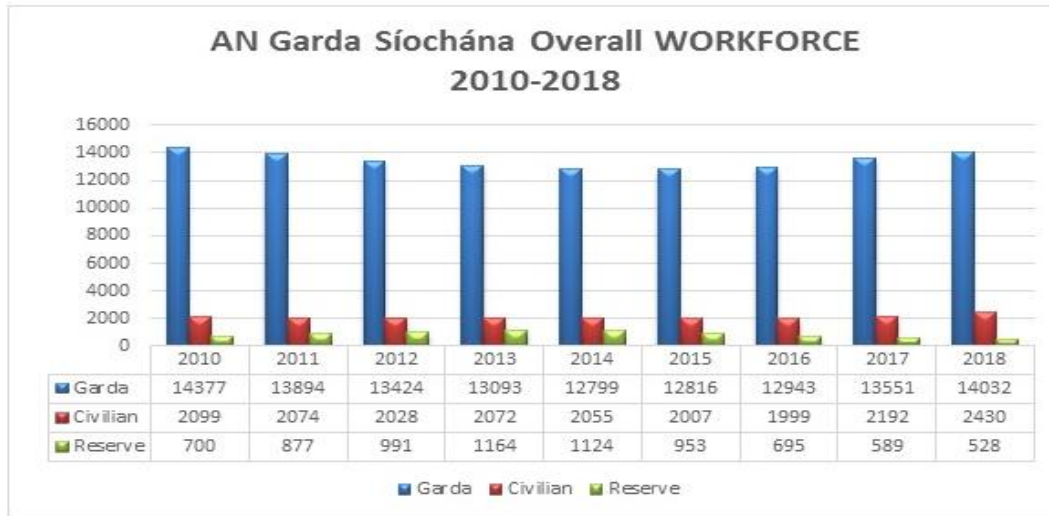
Source (AGS HRM)

Figure 10 Civilians as a % of overall AGS Numbers 2008-2017
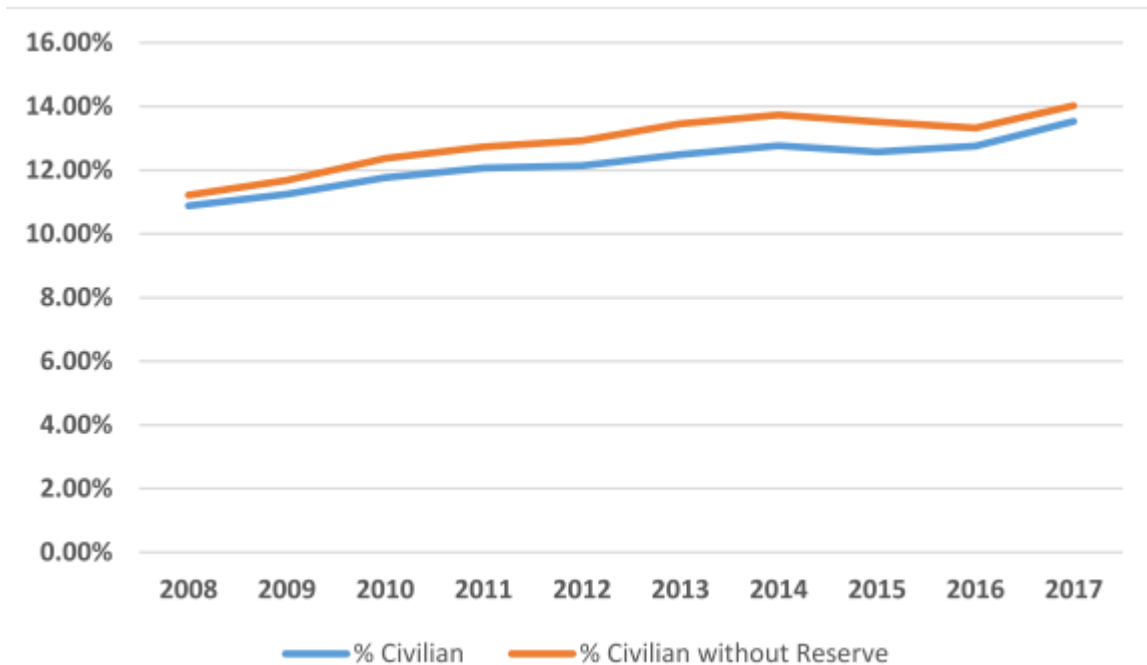
(Gavin, 2018)

3.3 An Garda Síochána; Structure and Hierarchy

The hierarchy of An Garda Síochána is typical of a medium level police force. Headed by an officer of Commissioner rank with a top-down hierarchical structure consisting of two Deputy Commissioners, ten Assistant Commissioners and the Chief Medical Officer of the Force, the organisation of An Garda Síochána is then divided into six regional areas which are under the control of the aforementioned Assistant Commissioners.

Each Assistant Commissioner has a number of Chief Superintendents in charge of "Divisions" which consist of several "Districts," each of which are headed up by a police officer of Superintendent rank. The functional or line manage" rank in the organisation is comprised of police officers of Inspector and Sergeant Rank, and they are responsible for day to day managerial tasks and allocation of resources. The breakdown of numbers and police officers in each rank is as shown in the following tables and figures. These are presented in order to illustrate the breakdown of staffing in the organisation and underpin the medium level attributes of the organisation, which are further alluded to in section 3.4

Gender

Whilst this research is based solely on knowledge and knowledge management in An Garda Síochána, it is relevant to mention the importance of gender in policing. An Garda Síochána currently employs approximately 4000 women at all ranks of the organisation. It should be stated, however, that the key respondents for this research were selected on the basis of the position they occupied as these were key in gathering the required information in relation to the work. At the time of writing, the organisation is developing its Diversity and Inclusion Strategy, which is designed to reflect the organisations stance in relation to gender balance and also reflect and encompass the growing diversity of society (source; Irish Oíreachtas).

To discuss gender in further detail would be outside the remit of this work; however, it is worth noting that Gachter for example, has reported that across a continuum of eight categories of stress-related issues in policing, only somatisation and health yield any significant differences in stress response (Gächter, Savage and Torgler, 2011). Given the stressful positioning of most front line police officer functionality, this is significant in highlighting the relevance and reality of gender equality in policing. Archbold contends that not enough research has been done in relation to how gender roles may influence women to get involved in policing promotion (Archbold and Schulz, 2008). Ultimately, however, knowledge is gender independent, and as the series of recommendations in this research clearly indicates, the rationale for this work is based on a need to see more knowledge and knowledge related paradigms in policing, which will be of substantial benefit to all.

Table 9 An Garda Síochána Ranks and Strengths 2019

Rank	Members	Average Age	Average Length of Service
Commissioner	1	54	1
Deputy Commissioner	1	58	36
Assistant Commissioner	9	58	37
Chief Superintendent	47	55	34
Superintendent	165	53	31
Inspector	380	48	26
Sergeant	2024	46	22
Garda	11628	38	13
Reserve Garda	480	43	9
Grand Total	14735	40	15

Source (AGS HRM)

The following table presents the breakdown of the organisations strengths vis-a-vis gender and age of service.

An Garda Síochana. Strenghts and Breakdown by Gender and Average Age.									
	Female			Male			Combined		
	Members	Average Age	Average Length of Service	Members	Average Age	Average Length of Service	Members	Average Age	Average Length of Service
Commissioner				1	54	1	1	54	1
Deputy Commissioner				1	58	36	1	58	36
Assistant Commissioner	2	58	35	7	58	38	9	58	37
Chief Superintendent	9	54	31	38	56	35	47	55	34
Superintendent	14	51	29	151	53	31	165	53	31
Inspector	64	46	23	316	49	26	380	48	26
Sergeant	431	43	20	1593	46	23	2024	46	22
Garda	3305	38	13	8323	39	14	11628	38	13
Reserve Garda	127	40	8	353	44	9	480	43	9
Grand Total	3952	38	14	10783	40	16	14735	40	15

Source (AGS HRM)

3.4 Global Strength Rankings

The total number of people employed in An Garda Síochána, (approximately 17,000 including police officers and civilian staff as of 2018) places it approximately 70th out of 140 countries in terms of global policing strengths via direct numerical comparison with developed countries, the highest being India with approximately three million police officers, and the lowest being the police force of the Holy See in Rome, (Vatican City), with approximately 130 police officers (Source; An Garda Síochána HRM Archives).

There are more countries with lesser strengths, however, but these would be controlled or under the control of "parent" counties, such as the United States, Great Britain, or France, and as such, do not operate independently.

This is also typical insofar as the ratio counts relate to the population of the Irish Republic vis a vis police strength. Given, for example, that the population is approximately 4.784 million people and the fact that the current strength of An Garda Síochána stands at 14,735 sworn members, this equates to one police officer for every 324 people. The population of London for example, is approximately 8.7 million, with approximately 31,000 police officers, and this equates to approximately one police officer for every 280 people.

The city of Los Angeles in California has approximately 4 million people with a police strength of 10.000. This equates to one police officer per 400 people. These figures suggest that An Garda Síochána represents an approximate median ratio in terms of police to public. The Republic of Ireland (while smaller than a lot of other states) also falls into the 73% of countries in the world with populations of between 1 and 20 million people (Buckley, 2016). This would suggest that any knowledge recommendation or solution in the public sector area of law enforcement could be generalisable to the same range of countries by virtue of scalability alone.

3.5 Professional Education

In conjunction with basic police training and in line with new public management initiatives, professional education is now offered to all police recruits, with the introduction of a Bachelor of Arts Degree in Applied Policing. This qualification stands at level seven on the of the State Agency, quality and qualifications Ireland (QQI) framework, and is in line not only with European Standards of Education such as the (EFQ), the European Qualifications Framework, and the Qualifications Framework for the European Higher Education Area (QF-EHEA) but also other worldwide police agencies.

For example, in the US, a bachelor's degree is required for most complex or advanced positions, particularly federal positions. This is in conjunction with an entrance exam specific to the agency (such as the Federal Bureau of Investigation (the FBI) or the Central Intelligence Agency (the CIA).

3.6 Global Trends in Education

In Brazil and Argentina, it is expected that police training will culminate in the awarding of a degree, and postgraduate programmes are offered in the areas of Public Safety, Social Sciences, Law studies, Public Policy, and Management (Sul and Alegre).

Interpol cite police training as having mandatory features or "goals" such as counter terrorism, border integrity, community protection, cyberspace security, global integrity, and environmental sustainability (Interpol). This remit is part of the issue of police training in that the data gathered for this research, in conjunction with previous research would suggest that it is difficult to deliver given its wide-ranging focus and the pronounced differences between formal driven training and informal experience (Fielding, 1988).

This has significant implications for police training, as there have been calls for it to be more streamlined, practical and focused, and ultimately shape the "remit" of a police officer's role, and also because the issue of support is not focused on as much as it should (Caparini and Osland, 2017), and this is crucial given the potential stress levels of police work.

In An Garda Síochána in recent years, new innovations have seen the establishment of the Garda Air Support Unit, Garda Mounted Unit, Garda Water Unit, Criminal Assets Bureau (CAB) and the "Pulse" system (an acronym for "police using leading systems effectively"), which have been set up in response to external pressures in the shape of freedom of global

movement, cybercrime and terrorism, and internal pressures in the shape of reform, accountability and public scrutiny.

3.7 Crime

In relation to this work, it is necessary to illustrate the "raison d'être" of the organisation under scrutiny, which is the prevention and detection of crime. At present, the only way to do this is to provide metrics and comparative analytics in relation to crime statistics.

In 2018 there were over 214,000 of various types committed in the Republic of Ireland. At the time of writing, the detection figures for 2019 have not been processed; however, it has been possible to obtain crime detection figures for the period 2009-2013 (Figure 13), and from that to get an idea of the type of detection rates that pertain to the organisation. Figure 12 indicates the recorded crime figures for 2018.

3.8 Crime Prevention

An organisations knowledge assets can be difficult to measure (Green, 2006), and this has resulted in organisational performance being measured in tangible metrics (principally financial), which are used to compare competitive advantage across competitors and industry (Goel, Rana and Rastogi, 2010). Intellectual capital can also be used to describe the "flow" of knowledge through an organisation (Subramaniam and Youndt, 2005), and the seminal definition of knowledge as "fluid" by Prusak reflects the difficulty in measuring it.

In a similar way, the metrics used to measure crime statistics are overt and usually based firmly in detection rates. In relation to this, Gottschalk suggests that "crime prevention implies the detection and hence the prevention of crime" (Gottschalk, 2006a). However, crime prevention also has to take into account the complex social fabric of society and discerned through patterns including poverty, exposure to crime, social status, employment,

and education and literacy. In other words, social needs need to be addressed. Maracine has suggested that a change from classical or formal methodologies towards knowledge and awareness of its capabilities is what is required to make an organisation truly knowledge capable and has conducted social needs analysis in order to illustrate this (Maracine *et al.*, 2012).

In relation to crime prevention, An Garda Síochána has a dedicated "National Crime Prevention Unit," which is responsible for the endorsement of crime prevention, as well as research into best practice (including global initiatives on crime prevention) and training.

The following two figures illustrate the level of crime detection and the types of crimes, which illustrate the typical areas of crime detection and prevention AGS is involved with. This serves to illustrate further correlation with other police forces and comparable crime and crime detection statistics

Figure 12 Recorded Crime in the Republic of Ireland, Quarter 4, 2018

Recorded Crime Quarter 4 2018

Rise in recorded fraud offences, robberies and sexual offences; drop in burglaries and criminal damage offences

Recorded crime statistics, based on data from An Garda Siochana, shows the number of incidents of *Fraud, deception and related offences* reported in 2018 increased by 18.4% compared to 2017, up 998 incidents to 6,434. The number of reported *Robbery, Extortion and Hijacking Offences* increased by 11.3%, while the number of reported *Sexual Offences* has continued to rise with 298 more incidents recorded in 2018 than in 2017, an increase of 10.3%. There was an increase in *Offences against Government, justice procedures and organisation of crime*, up 10.4%, while drug offences rose by 9.5%.

The number of incidents of *Burglary and related offences* fell by 11.5% in 2018 compared to 2017, from 19,182 to 16,969. There were decreases in the numbers of recorded offences of *Damage to property and the environment* (-7.2%), and to incidents of *Theft and related offences* (-3.1%). Recorded homicides fell from 83 to 74.

Table 1.1: Recorded crime incidents[1] classified by offence group, annualised[2] total to Q4 2017 and 2018

	Annualised total to Q4			
ICCSq offence group	2017	2018	Change	% Change
01 Homicide offences	83	74	-9	-10.8
02 Sexual offences	2,884	3,182	+298	+10.3
03 Attempts or threats to murder, assaults, harassments and related offences	18,925	19,955	+1030	+5.4
04 Dangerous or negligent acts	8,374	8,553	+179	+2.1
05 Kidnapping and related offences	129	128	-1	-0.8
06 Robbery, extortion and hijacking offences	2,186	2,432	+246	+11.3
07 Burglary and related offences	19,182	16,969	-2213	-11.5
08 Theft and related offences	69,283	67,127	-2156	-3.1
09 Fraud, deception and related offences	5,436	6,434	+998	+18.4
10 Controlled drug offences	16,792	18,390	+1598	+9.5
11 Weapons and explosives offences	2,377	2,434	+57	+2.4
12 Damage to property and to the environment	23,209	21,533	-1676	-7.2
13 Public order and other social code offences	31,199	31,990	+791	+2.5
15 Offences against Government, justice procedures and organisation of crime	13,740	15,173	+1433	+10.4

[1] These statistics are categorised as Under Reservation. This categorisation indicates that the quality of these statistics do not meet the standards required of official statistics published by CSO.

[2] The annualised figure for a given quarter is the total number of crimes recorded in the 12 months prior to end of that quarter.

Open in Excel: Recorded Crime Quarter 4 2018 Table 1.1 (XLS 35KB)

(Source AGS HRM)

Figure 13 Detection Rates of Major Crimes in the Republic of Ireland, 2009 - 2013

Table 1 Detection rates Group 01 to Group 16, 2009-2013

%

ICCS offence group		Detection Rate				
		2009	2010	2011	2012	2013
01	Homicide offences	81	83	86	77	84
02	Sexual offences	59	55	58	53	51
03	Attempts/Threats to murder, assaults, harassments and related offences	61	63	61	61	62
04	Dangerous or negligent acts	100	100	100	100	100
05	Kidnapping and related offences	45	61	68	60	63
06	Robbery, extortion and hijacking offences	52	54	49	46	41
07	Burglary and related offences	24	26	23	22	20
08	Theft and related offences	37	38	36	35	33
09	Fraud, deception and related offences	56	51	45	44	42
10	Controlled drug offences	99	99	99	99	99
11	Weapons and explosives offences	90	90	89	89	90
12	Damage to property and to the environment	22	23	23	22	22
13	Public order and other social code offences	94	94	94	93	93
14	Road and traffic offences (NEC)	99	99	99	99	99
15	Offences against Government, justice procedures and organisation of crime	98	99	98	99	99
16	Offences not elsewhere classified	67	62	51	52	46

Table 2 Incidents of *Homicide offences (ICCS 01)* recorded and detected, 2003-2013

(Source AGS HRM)

169

3.9 Crime Detection

As can be seen, An Garda Síochána has a very high detection rate in relation to homicide and controlled drug offences, road traffic violations and offences against Government, Justice Procedures, and the organisation of crime. This puts the organisation in a similar light in relation to other police forces, which generally experience similar detection rates in relation to serious crime in particular, but also controlled drug offences, with the London Metropolitan Police, for example, showing a homicide detection rate of 84% in 2017. However, An Garda Síochána is one of the lowest per capita police forces in Europe, with an average of 278 police officers per 100,000 citizens, which are 40 less than the European average. According to the European Commission, Cyprus has the highest per capita ratio and Hungary, the lowest with 573 and 90 police officers per 100,000 citizens, respectively.

3.10 Oversight

The data gathered thus far has pointed to a large degree of oversight in An Garda Síochána, who has the Garda Síochána Ombudsman Commission (GSOC), the Policing Authority, the Garda Inspectorate, the Department of Justice, and the Public Accounts Committee of the Government, to account to. Each of these bodies represents disparate mandates with regard to oversight which range from issues around misconduct, use of force, complaints from the public, and transparency.

As a comparison, the United Kingdom, and the Police oversight act (enacted in 1966) has the Independent Police Complaints Commission (IPCC), the Police Complaints Commissioner for Scotland (PCCS); and the Police Ombudsman for Northern Ireland (PONI). These bodies (while overseeing different police forces) investigate issues such as transparency, use of force and firearms, and performance and budgeting. The Knapp Commission in New York was set up during the 1970s to introduce reform in the areas of misconduct and "risky behaviour," and the NYC Civilian Complaint Review Board was set up as a result of this. This body is the oversight agency of the NYPD.

The Effects of Oversight

The results of oversight are somewhat contentious, as can be seen from the data analysis and the reaction to it, which can range (from the perspective of An Garda Síochána) from acceptance to antipathy. However, it does imbue the knowledge sharing processes in the organisation with a degree of diversity, as there are palpable issues around the efficacy of police oversight and the effect it has on knowledge. Not just in relation to An Garda Síochána, but in relation to police forces in general. Gottschalk, for example, has written about police oversight and has attempted to "map" the derivation of knowledge sharing processes on to a commensurate organisational flow which charts the movement of an organisation from activity to learning in linear stages, using knowledge as a "driver" through the stages (Filstad and Gottschalk, 2010).

3.11 The Complexity of Policing

Like any public sector organisation An Garda Síochána occupies a unique space in the organisational landscape. It's overtly military-like hierarchical structure, and its public sector attributes make it an ideal candidate for research into the public sector and public sector knowledge management (Filstad and Gottschalk, 2011). But the complexity of managing the dual mandate of service delivery and governmental mandate is one that makes (almost by definition) policing a knowledge-intensive enterprise (Schafer, 2009).

It is therefore suggested that any potential solution or suggestion that utilises knowledge or knowledge management needs to take cognisance of this complexity by looking at the *culture* of the organisation (Fielding, 1988; Reuss-Ianni, 2011). Public sector culture has been discussed in chapter two, but it is pertinent to re-iterate the direct linkages in the literature between public sector culture and knowledge sharing (Bučková, 2015), and the promotion of knowledge sharing processes which could lead to progress within the public sector (Amayah, 2013b).

This would also have the effect of making knowledge generation more prevalent in the public sector as the culture would be disposed towards KM practices (Riege and Lindsay, 2006). However, given the non-disclosure nature of most criminal investigative work, rules around data privacy, and the pressure to be knowledge-intensive, the literature has suggested that police culture ranges from secretive (Christensen and Crank, 2001), to historically conventional (Barton, 2004) to disparate, based on levels of rank and/or seniority (Reuss-Ianni, 2011).

3.12 Conclusion

An Garda Síochána shows all the hallmarks of a typical police organisation that polices by consent, cloistered, hierarchical, and historical, with specific public sector traits that are comparable not just to other police forces, but to other public sector bodies, such as the military, health; and education. What makes this organisation suitable for a case study is that by its own admission, it does not appear to manage knowledge well (Interview 15 JT). It also operates in a mode of continuous reform born of both new public management paradigms (such as increases in governmental accountability and scrutiny), and its own strategic imperatives through its "modernisation and development programme."

Both of these, in real terms, are costing the Irish exchequer millions of Euro and are (at present) not reflected in real-world gains, such as a discernible reduction in crime or more police officers on the street. To be more specific, the introduction of the analysis service, the strategic transformation office, and the move away from having front line police officers in administrative positions have not impacted substantially on crime figures. Moreover, the data would suggest that there is an element of confusion amongst people (both managerial and front line) as to the efficacy of these initiatives.

That is why a focus on knowledge and knowledge management solutions designed to highlight knowledge as a practice and promote the inculcation of knowledge processes will, it is submitted, make for more cohesive organisational processes in the organisation.

This chapter, in presenting a background to AGS and its positioning with regard to other police forces in terms of strengths, training and hierarchical structure, underpins the selection of the organisation as a case study exemplar.

The chapter has further illustrated that to answer the research objectives; it is obligatory to select a typical, modern, medium level police force in order to make the valid assessments in relation to the evaluation and contribution of knowledge and knowledge practice, and in order to imbue the recommendations with a degree of generalisbility. Thus, this chapter assists in illustrating why AGS represents an eminently suitable example for this case study.

Figure 14 An Garda Síochána Organisational Chart (Part 1)
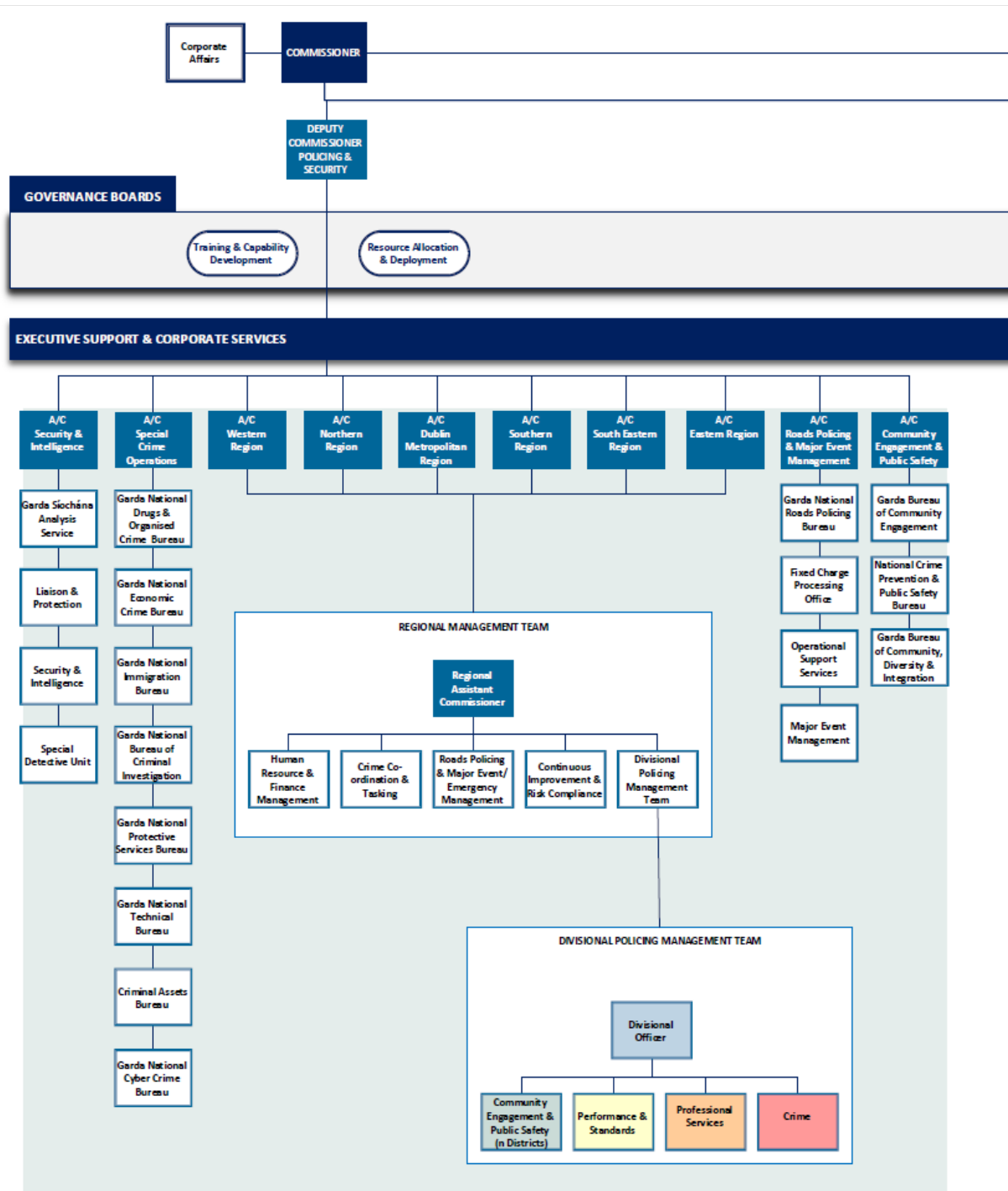
Figure 15 An Garda Síochána Organisational Chart (Part 2)
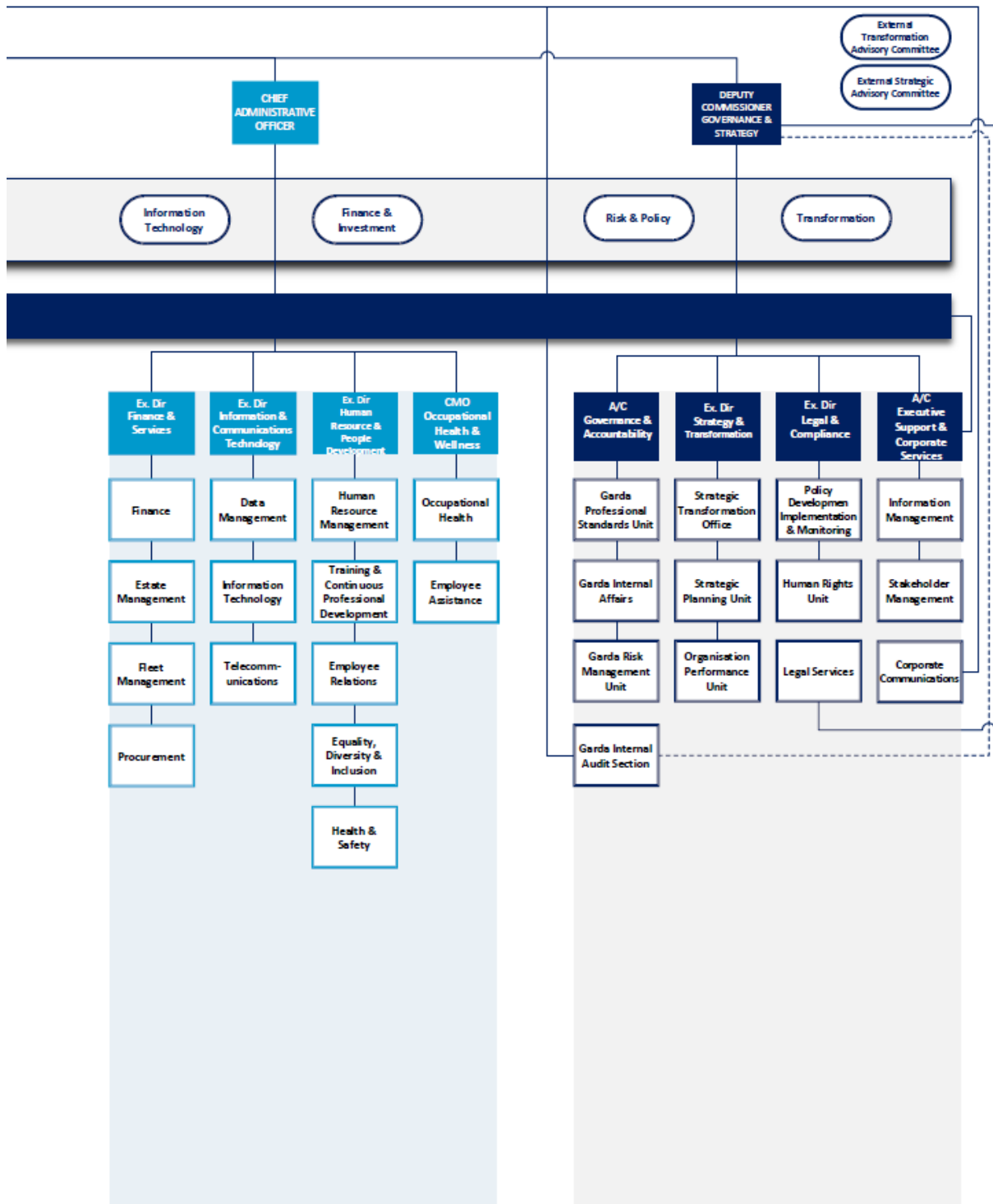
(Source AGS HRM)

Chapter 4 Research Methodology

4. 1 Introduction

This chapter will present the pertinent research methodology utilised to reach the objectives set out for this work. It is structured as follows; Section 4.1 will present the research philosophy and strategy adopted by this work. Section 4.2 will outline the research design and process used. Section 4.3 will discuss the data generation, collection and processing, and Section 4.4 will discuss the rationale behind utilising an exploratory case study, will present case study methodology, and discuss the exploratory approach of this research. Section 4.5 will then provide a brief summary of the chapter. The inherent danger of research is that it can be conducted without clear direction or interpretation (Walliman, 2011). Therefore, this chapter will discuss research with clear paradigmatic relevance to the research objectives.

4.2 Research Philosophy and Strategy

Research has been defined in a myriad of ways, from "something that people undertake in order to find out things in a systematic way, thereby increasing their knowledge" (Saunders, Lewis and Thornhill, 2009), to "seeking methodical processes to add to one's own body of knowledge and, hopefully, to that of others by, the discovery of non–trivial facts and insights" (Judith, 2005).

The ethos of research is to uncover salient information and facts pertaining to a topic of relevance or reference, and in a particular order (Ghauri and Grønhaug, 2005). Then an appropriate *method* or *methodology* is applied in order to examine the findings and add structural, academic, empirical, or ethnographic validity to them. There should also be a clear focus on the part of the researcher, based on the nature and scope of the project, which will

assist in selecting the appropriate methodology or methodological approach in order to realise the objectives of the research at hand (Saunders, Lewis and Thornhill, 2009).

The purpose of understanding a methodological approach to research lies in the ability to defend a chosen stance. This stems from epistemological and ontological awareness, both of the research design and of the methods chosen. But in order to complete this process, it is necessary to be aware of the research paradigms that are available and the philosophical foundations that give rise to them (Johnson and Clark, 2006). This will underpin the research philosophy chosen with understanding and rigour. In adopting a philosophical stance, there are fundamental differences in the positions one can take in relation to the question of research, for example, ontological versus epistemological (Holden and Lynch, 2004).

Ontology, Objectivism and Subjectivism

Ontologists question the nature of being and reality (Burrell and Morgan, 1979), and *epistemologists* look at the nature of knowledge and its existence, and what constitutes "relevant" knowledge (Saunders, Lewis and Thornhill, 2009).

Within this duality, there are several sub-dichotomies that require elucidation. The study of ontology is essentially comprised of objective and subjective stances. *Objectivism* looks at reality in terms that are separate from human ability and intervention. It's protagonists suggest that reality is not a human phenomenon (Holden and Lynch, 2004) and that social science is extraneous to human activity. Objectivism is the predominant social science perspective. *Subjectivism* conversely suggests that reality is a purely human construct and lends itself to taking account of preference, experience, and worldview (Ellig and Thatchenkery, 1996).

These two view-points ultimately take cognisance of reality as seen through a single lens (objective), or multiple lenses (subjective). Is it pertinent to solve issues from a singular context or take account of multiple interpretations in order to form judgements through continual revision (Huizing, 2007).

Epistemology, Interpretivism, and Positivism

Epistemology is the study of knowledge and how humans comprehend its existence (Becker and Niehaves, 2007). It presents a similar dichotomy to ontology in two opposing standpoints, *positivism, and interpretivism.* In a similar approach to the ontological perspective, positivism and interpretivism echo the objective and subjective standpoints of their respective advocates. *Positivism* stresses the necessity for a layer of abstraction between the subject and the person studying the phenomenon, which invites structural, scientific, and non-interpretive judgement (Baldry and Newton, 2014).

Interpretivism

Interpretivism, on the other hand, suggests that human intervention is entirely appropriate in decision making and research and that objective reality cannot be copied. Ultimately, therefore, it is unsuited to scientific scrutiny (Walsham, 1993). Interpretive analysts argue that the reductive stance taken by science mitigates against qualitative research (Kalra, Pathak and Jena, 2013). The interpretive approach to ensuring that social science is included in paradigmatic philosophy suggests that an increase in awareness and understanding of the existence of multiple realities will account for reason, interpretation, and objectivity (Denzin, 2010). This is particularly effective when coding cycles of qualitative data as the suggestion that an "observer-independent view of the world is an unachievable goal" (Kalra, Pathak and Jena, 2013), is echoed by model-dependent realists who adhere to the ideal that complete objectivity is impossible (Hawking and Mlodinow, 2010).

Interpretivism, as mentioned, is a paradigmatic approach to research that involves looking at the interaction between research and researcher, which is *socially constructed* (Kalra, Pathak and Jena, 2013). This involves a hermeneutic spiral of iterative analysis which can be beneficial in eliciting trends, themes, and categories from the data (Geertz, 1973; Saldaña, 2015). Saunders suggests interpretivists look for "irrationalities" in the data which stem from observations, nuances, and specifics attributable to the research (Saunders, Lewis and Thornhill, 2009). In relation to the research objectives of this work, it could be contended that there are motives for its selection as a research paradigm.

For example, discernible public-sector nuances of accountability, government intervention, insularity and culture are qualitative in nature and suit qualitative dialectic enquiry; and secondly, the hierarchical nature of the public sector and the identification of knowledge holders have shown to be a complex mix between the individual, the levels of accountability (government, society, and the individual department), and the issue of tenure. This requires a level of knowledge on the part of the interviewee that echoes the logic of sociology (Silverman, 1970) and an understanding of the phenomena or context surrounding the research and the respondents (Goldkuhl, 2012).

However, Interpretivism in a purely qualitative study does not allow for the researcher to adopt or adapt their philosophical stance as necessary; rather it allows for a relativist standpoint to be taken that is difficult to generalise (Ngulube, 2015). This, in effect, means that a researcher could find it difficult to "shift" from an interpretivist standpoint if the situation called for it.

Positivism

Positivism has been adapted for use within qualitative research (Goldkuhl, 2012); however, its principle identification is with quantitative studies, as it is primarily associated with scientific enquiry (Saunders, Lewis and Thornhill, 2009) and objective reality (Kalra, Pathak and Jena, 2013). It also (traditionally) makes assumptions about pure objectivity (J. C. Spender, 2006) and is not used as much today in favour of post-positivism which concedes that a truly objective viewpoint is relatively difficult to postulate (Michael Quinn Patton, 2002).

Positivism also espouses the view that knowledge hinges on direct observation and this frees it from individual perception (Howe, 1988). However, in recent times, a new "softer" view of positivism has emerged, with social scientists admitting that to adhere to rigidly to dogma is to render disbelief in an imperfect world (M Q Patton, 2002). These "*post positivists*" accept that imperfections are a reality, and all research can do is posit a "partially objective account of the world"(Denzin and Lincoln, 2005).

Post Positivism and Constructivism

Chronologically, the post-positivist movement has argued for a philosophical change of stance, and through this has come recognition that it is unrealistic to attempt to rationalise a completely unbiased and pragmatic worldview. Opponents to this standpoint have denigrated the positivist & empiricist standpoints and advocated human complexity which has to be taken into consideration, thereby separating correlation from causation (Collier, 1994).

Critical realism, (born of critical naturalism and transcendental realism) suggests that we must interpret our experiences and make meaning of them, which implies that these interpretations are layered because of the phenomena we observe and the reasons *why* we

observe them (Saunders, Lewis and Thornhill, 2009). From this standpoint, some academics have adopted a position entitled *"model dependant realism"* (Kalra, Pathak and Jena, 2013). According to this theory, "it is pointless to ask whether a model is real, only whether it agrees with observation" (Hawking and Mlodinow, 2010), and, as mentioned, negates pure objectivity.

The observational standpoint of the model dependant realists is synonymous with the concept of value judgement or *axiology*, which is the theory of placing *value* on an observation and using this as a basis upon which to make an assumption or articulation (Heron, 1996). Ironically almost, this is a *constructivist* approach to judgement value, and constructivism postulates that a decision cannot be made objectively as there is a relationship between it and the cognitive experience of the decider (Becker and Niehaves, 2007).

Ultimately, this leads to the supposition that positivism and interpretivism are incompatible. A dichotomy supported by academia (Howe, 1988); however, this dichotomy lends itself to the data collection stage of research more than the analysis of the result. Moreover, the majority of analysis favours a positivist approach, which eschews interpretivism and allows for quantitative theory to be heightened to the level of general abstraction (Savenye and Robinson, 2004).

This debate is thus more intriguing in terms of the layered approach which is unavoidable if the aim of the research is to avoid dogma. Research methodology can become secondary to the degree of complexity around the decision making processes involved as a result. (Saunders, Lewis and Thornhill, 2009). Accepting a degree of uncertainty in any research process (when choosing between an epistemological, ontological and axiological stance) and deciding that a clear path is not realistic is, by implication, taking a *pragmatic* stance.

4.3 Pragmatism

The nature of this research could lend itself to a multiplicity of approaches. However, objectifying a solution to capitalise on knowledge assets is not just about making core assumptions in relation to an epistemological or ontological position (Holden and Lynch, 2004), it is about developing a considered approach to either the social or scientific aspects of the research being undertaken. This can be taken by gaining an awareness of the particular position chosen. To do this, a further awareness of the *extremes* of positioning should be illustrated (Morgan and Smircich, 1980).

Morgan & Smircich have examined a "network of basic assumptions characterising the subjectivist – objectivist debate within social science" (Holden and Lynch, 2004). This places ontological assumptions on a spectrum between subjectivist and objectivist, epistemological assumptions between nominalism and realism, and assumptions in relation to human behaviour on a spectrum between "anti-positivism and positivism" (Holden and Lynch, 2004).

A pragmatic approach to research involves clearly defining the research question and discarding a specific direction in which to research it in favour of a position that best answers it (Johnson and Onwuegbuzie, 2004). Adopting a pragmatic approach allows the researcher to justify whatever methodology is deemed appropriate to answer the research question and objectives.

Pragmatism essentially consists of a justified belief that the significance of an action instils in a person an explanation for its existence (Johnson and Onwuegbuzie, 2004). This maxim allows a researcher the latitude to interpret their epistemological position in a way that reflects the research question and capitalise on deviations in it (Saunders, Lewis and Thornhill, 2009).

Tashakkori and Teddy contend that separating the knower and the known is of little value if the opposite cannot be countenanced during the research process (Tashakkori, Teddlie and Teddlie, 1998).

Therefore, pragmatism allows the research to adopt a philosophical stance that is reflective of the research in question and is situated within the real world. This can take place as a result of "the interplay between knowledge and action" (Goldkuhl, 2012), as one of pragmatism's key tenets is the fact that the result of a concept is inherent in its conception. This calls for practical and achievable goals (in the case of an organisation, for example), and goals that can make a real difference to (in this case) real world policing.

Lovejoy (1908) has described over ten kinds of pragmatism, however, Goldkhul has proposed a more simplified delineation consisting of three types of pragmatic approaches based on qualitative research conducted in the information systems field (Goldkuhl, 2012). While information systems are not the remit of this work, amongst these is "functional pragmatism" which is adopted by this research as being the most suitable for this work.

Functional Pragmatism

Functional pragmatism builds on the maxim that knowledge begets action (Goldkhul, 2012) and implies that knowledge constructs (if utilised effectively) can influence action and promote procedure. The basis for this is that intervention can form the basis for engagement with the research and content, and the knowledge gained can be utilised to allow for generalisability (Mathiassen, 2002). An opposite view can be taken to allow for objectivity to be engrained; however, for the purposes of this research, functional pragmatism can allow the data to be more detailed and verifiable. This approach is ideal for research such as this as its remit is to look at the contribution of knowledge and knowledge management practices in policing and to do this, engagement with the data is critical.

Kenneth Arrow's "economics of learning" (Spender and Scherer, 2007a), has led scholars to investigate the pragmatic approach to knowledge and knowledge accumulation, as it is concerned with the investigation of new phenomena regarding the emergence of institutional change. This will occur successfully if sufficient attention is paid to the results of this change, and these results are then clearly analysed (Williamson, 2009). Furthermore, Arrow's social choice theory echoes the pragmatic view of knowledge insofar as individual choice can and should influence collective thinking and decision making (Maskin, 2019).

Functional pragmatism, therefore, is ideal for research such as this because the objectivity that the researcher shows can enhance the rigour of the analysis. It also allows for the fact that as a serving police officer researching a case study on a police force, it must be recognised that it is impossible to maintain complete objectivity. Moreover, in order to fully answer the research questions, it is imperative that a degree of experience is brought to the research in order to ground the data and make the analysis more robust (Mills, Bonner and Francis, 2017). Pragmatism is further suited to this research as it approaches research from an *interventionist* stance rather than an observational one (Goldkuhl, 2012).

This is a practical basis from which to assess the efficacy of a solution or framework in a particular domain, which is what this research will endeavour to do. Pragmatism is also a viable collaborator in qualitative work as it allows for an existential approach with real-world experience being the moderator of theory (Johnson and Onwuegbuzie, 2004). This also makes it ideal for conducting future analysis on any proposed recommendations from this research which has been mandated by An Garda Síochána, and may be implemented on a pilot basis at a later stage.

Taking a functionally pragmatic approach to this research allows for the data to be utilised and detailed in a linear fashion. According to Darke, it takes certain attributes to be a pragmatic researcher, including the ability to take advantage of opportunity, and to persist against contrary odds (Darke, Shanks and Broadbent, 1998). Pragmatism, therefore, will engender the data with a processional order of causality and result in potential policy propositions or initiatives that will be presented against a rigorous backdrop of analysis.

4.4 Research Methods

In order to further the research process, the paradigms and foundations of research philosophy should point the researcher to a design or an answer to the topic under scrutiny. Assuming the researcher has adopted a philosophical position, the next task is to extrapolate the research question from a postulation into a viable project (Robson, 2002). The following section will discuss the practicality of utilising a qualitative approach for this research.

4.5 Qualitative Research

Qualitative research is described as "*research devoted to developing an understanding of human systems*" (Savenye and Robinson, 2004). Qualitative methodologies deal with meaning, context, action, and language (Dey, 1993). They are used to answer questions that are subjective and interpretive in nature, such as experience, judgement and values. In other words, the "how's and why's of human behaviour" (Kalra, Pathak and Jena, 2013). There are over forty different types of qualitative research approaches (Tesch, 1990). Figure 16 outlines the principal qualitative approaches used in research. This table illustrates the range of potential qualitative methods available, and illustrates the depth and breadth of qualitative study that can be undertaken under illustrated subheadings. This table is also relevant to those who wish to compare qualitative methods of research.

Figure 16 Approaches to Qualitative Research

Different Approaches to Qualitative Research.		
Action Research	Ethnographic Content Analysis	Interpretive Interactionism
Case Study	Interpretive Human Studies	
Clinical Research	Ethnography	Life History Study
Cognitive Anthropology	Ethnography of Communication	Naturalistic Inquiry
Collaborative Enquiry	Oral History	
Content Analysis	Ethnomethodology	Panel Research
Dialogical Research	Ethnoscience	Participant Observation
Conversation Analysis	Experiential Psychology	Participative Research
Delphi Study	Field Study	Phenomenography
Descriptive Research	Focus Group Research	Phenomenology
Direct Research	Grounded Theory	Qualitative Evaluation
Discourse Analysis	Hermeneutics	Structural Ethnography
Document Study	Heuristic Research	Symbolic Interactionism
Ecological Psychology	Holistic Ethnography	Transcendental Realism
Educational Connoisseurship and Criticism	Imaginal Psychology intensive evaluation	Transformative Research
Educational Ethnography		

Adapted from (Dey, 1993)*, and* (Tesch, 1990)*.*

Qualitative research's interpretive philosophical foundation is synonymous with induction (Guest, Namey and Mitchell, 2012). As qualitative investigation invariably asks subjective questions of the researcher and the subject, the crucial consideration is that the investigative *themes* are linked in orientation and scope, as evidenced in the table above (Braun and Clarke, 2006). Qualitative research is a disparate field of theory as evidenced in the table above (Kalra, Pathak and Jena, 2013), and it aims to understand social phenomena by explaining it in the context of sense-making and meaning (Denzin and Lincoln, 2005).

This study adopts a qualitative approach as it is most suitable to contextualise the data, follows an inductive approach, and is suitable to a wide range of interpretative, analytical methodologies (Dey, 1993). The qualitative stance taken by this research utilises pragmatism as a paradigm as it allows it to maximise the subjectivity of the data and present the findings in a pragmatic way.

4.6 Research Design

Justifying the rationale for a purely qualitative approach is generally onerous as it is commonly accepted that qualitative research is harder to justify and accept that its quantitative sibling (Gephart Jr, 2004; Pratt, 2007). The pluralistic stance traditionally adopted by knowledge experts (Spender, 1998; J.-C. Spender, 2006b) is echoed in the subjectivity and complexity of qualitative analysis (Kirk, Miller and Miller, 1986). Capturing the somatic and discursive elements of knowledge and learning eschews positivism and invites inductive, empirical context (Roberts, 2015). Historically, there have been many criticisms levelled at qualitative research (Pratt, 2007). This has been levelled to the extent that to some scholars, the option of a mixed methodological approach may be the only one which is justifiable in order to bring work of a knowledge nature to a state of purposive specificity (Creswell, 2013; Mc Evoy, Ragab and Arisha, 2018). However, given the nature of this research, the following reasons are adduced to illustrate the practicalities of this methodological standpoint;

1. From the perspective of rigour, theoretical sampling is clearly used in order to reflect the "hermeneutic spiral" as espoused by Hood, which attempts to align theory with data and thus underpin the theoretical hypotheses which will underpin the knowledge findings and recommendations (Charmaz, 2006).

2. Elements of causality can be ideally captured in this approach, as in the interpretivist approach it is a socially constructed method, which will involve several iterations of intensive analysis in order to elucidate categories and themes (Saldaña, 2015). This is why the data in this research will be cycled through several iterations of qualitative coding in order to add rigor to the analysis.

Attempts to quantify knowledge must either be embedded in suitable quantitative metrics which can be driven by the necessity to quantify a knowledgeable foundation and embed it in strategy (Lev and Daum, 2004). It could also be quantified through the use of detailed qualitative analysis, which can be induced by a number of methodological approaches, including a grounded theoretical approach. Thus perhaps, the most suitable justification for a methodology is that it should be synonymous with the process that it is trying to engender (Glaser and Strauss, 1967).

Given the sociological aspect to this work (that of dialectical inquiry), it is proposed not to generate theory as a fixed dialogue, rather a "malleable" goal that can be utilised to best explain the phenomena under scrutiny (Glaser and Strauss, 1967). This has the possibility of pushing the research in either a substantive or formal direction. One is born of comprehensive comparative analysis and the other of sociological idiom, which may lead the research in a potentially circuitous path, but may also lead to a more constructivist outcome. This would, in essence mean that constructing theory for identifying effective knowledge solutions is born not just of wanting to elicit relevant analysis; rather, reflect the level of hereto unrestricted access to what is traditionally a cloistered, secretive, and hierarchical organisation, (a police service). This, it is contended, will facilitate theory generation to match the complexity of the data.

Research Strategy

Utilising an existing theoretical research framework from which to provide context provides a theoretical background for a research project; Saunders research framework provides a contextual standpoint from which to illustrate the research design. The outer layer of this framework refers to the philosophical position that has been discussed, (in the case of this work, pragmatism). In order to ontologically defend this position, it is ultimately the

contention of this research that reality is subjective, and "real-world experiences" inject the data with complexity, intuitiveness, and rich theoretical standpoints. In view of the data collected, the analysis will clearly show (amongst other pertinent issues) the rise of unorthodox knowledge holders in response to a non-directed need. This illustrates the complexity of necessity, subjectivity, and ultimately, the relevance of capturing this knowledge.

The design approach to this work involves an exploratory case study in Irelands Police Force, which utilises a qualitative approach. As case studies are discussed in section 4.5, at this point it is essential to select a relevant research design (Saunders, Lewis and Thornhill, 2009), and the reasons for this are as follows;

1. The design is informed by the research approach, and this is evident in choosing an appropriate philosophical stance.

2. The choosing of an appropriate approach brings clarity to the research process.

3. It allows the research design to be adapted to changes in the hypotheses (if applicable).

(Easterby-Smith and Thorpe, 2002)

Theoretical Deduction, Induction and Abduction.

The main aim of research is to promote or examine existing theory or generate new methods of causality to account for a phenomenon. In this case, knowledge and knowledge management in policing. Notwithstanding the generation of theory from supposition or presumption, there are three schools of thought on its provision: *Deduction, Induction, and Abduction.*

This study follows the inductive approach as it is ideally suited to evaluate the patterns and themes that accrue from the data. In the public sector and particularly in law enforcement, knowledge and knowledge management is a multifaceted process that can become tangential, according to the reality of investigative procedures in particular (Dean and Gottschalk, 2007; Massaro *et al.*, 2015).

According to Patton, "inductive analysis means that the patterns, themes, and categories of analysis come from the data; they emerge out of the data rather than being imposed on them prior to data collection and analysis (M Q Patton, 2002).

Inductive theory is concerned with the identification and coding of emergent themes within data, and it attempts to generate theory regarding the contemporary or historical phenomena under scrutiny (Hodkinson, 2008). Inductive research is ideally suited to research such as this as it caters for research that is concerned with the development of frameworks or solutions from "observations of empirical reality". This adds to or caters for generalisability and allows the results of the case study to be utilised for further study.

4.7 Case Studies

A case study has been described as a research methodological phenomenon that allows correlation of a generated hypothesis or hypotheses to a generalisable data set (Flyvbjerg, 2006). It has been defined as is "an empirical enquiry that investigates a contemporary phenomenon within its real-life context, especially where the boundaries between phenomenon and context are not clearly evident, and it "relies on multiple sources of evidence" (Yin, 1994, p. 13).

Case studies allow for "context-dependent" knowledge to be described and for qualitative analytical research to be conducted with the aim of amalgamating data and hypotheses to propose and examine theoretical constructs. Ultimately, they can provide for detailed description of particular phenomena (Darke, Shanks and Broadbent, 1998) and allow for qualitative data to be "generalised" to theory (Pratt, 2007).

There are typically three types of case study;

1. **Single instrumental case study**. First, the researcher focuses on an area of concern, and then selects a bounded case to illustrate that issue or concern.

2. **Collective multiple case study**. First, the researcher focuses on an area of concern, and then selects several bounded cases to illustrate that issue or concern.

3. **Intrinsic case study**. The researcher studies the case itself that is unique or unusual.

4.8 Instrumental Case Study

For this research, a single, instrumental exploratory case study has been identified as having the most relevance for the following reasons;

1. An exploratory case study is primarily utilised to analyse composite sets of experience (Ogawa and Malen, 1991), and allows for research to be identified using causality and thematic identification.

2. Given the propensity of the public-sector nuances to generate similar constructs, for example, accountability, legislative mandate, and defined hierarchical reporting structures, there is a basis for generalisability throughout areas such as health, education, and the security services (Seba and Rowley, 2010; McEvoy, Ragab and Arisha, 2016).

3. A single case study allows for a purposive approach to be taken to the issue of subjectivity, the level of which can increase as the number of sources, inputs, and ultimately cases increase, thereby potentially diluting what can be considered "credible and confirmable" results (Merriam, 1985; Merriam and Tisdell, 2015).

4. A single case study affords the researcher more latitude to explore the data, establish connections and causality, and make inferential hypotheses that can lead to valid theoretical assumption (Barton and Valero-Silva, 2013).

4.9 Limitations of Case Studies

Case studies are also ideal for examining "falsification" (Flyvbjerg, 2006), which can identify issues that on closer examination are not what they seem. In this study for instance, it has been shown that the issues of "siloism" pervades policing in the public sector, even though it is not what the public sees or is necessarily aware of.

Case studies do have limitations, however, and these are presented and discussed as follows;

The volume of data generated can make it difficult to analyse;

> This case study generated over four hundred pages of transcribed data, which needed to be processed. This involved transcription, analysis, comparison, deduction, theoretical sampling and categorisation, and sufficient time had to be given to this process.

Case study data is time-consuming to collect and analyse;

> In this case, data was gathered over a period of over eighteen months and rigorously analysed against a backdrop of grounded theoretical deduction. This process in its entirety took over twenty-four months due to the volume of data.

They lend themselves to researcher "intuition and expertise"; however, this can lead to a lack of objectivity on the part of the researcher;

> This is particularly important for any researcher to be aware of their own ability (and this can be brought to bear in the skill of eliciting relevant data), but also to ensure that the data remains objectively gathered, analysed, and presented.

Cross-Sectional Studies, (as used in this research) for example, are, according to Saunders a "snapshot" of the research topic being investigated (Saunders, Lewis and Thornhill, 2009). This has obvious implications for case study research in that the future state of the phenomenon under investigation may itself change over time.

In the case of this research, it is envisaged that the recommendations will be utilised by the organisation going forward, as the KM recommendations will be put in place on a trial basis initially. It is envisaged that further research will be carried out by this researcher and others in conjunction with the Garda analysis service, the Garda research section, and TU Dublin. This will be done to assess the effectiveness of the proposals and to continue to implement change initiatives based on the initial results.

4.10 Case Study and Theory Derivation

It is crucially important to contextualise not only the case study approach but how it can answer the research questions. In the case of this research, the ultimate objective is the research question; "**what is the role and contribution of knowledge and knowledge management practices in policing, the case of An Garda Síochána."** In order to do this, it is imperative that the choice of case study be clearly defined and the key similarities between (in this case) An Garda Síochána and other public sector bodies clearly illustrated. There are two specific reasons for doing this, one, it underpins the rationale for the utilisation of a single case study (if the similarities are pronounced), and two, it imposes a sound methodological approach through the use of stringent data coding and the awareness of overlap. This included the potential for substantive, constructivist and inferential coding to be used in the data analysis (Glaser and Strauss, 1967; Jennex, 2006).

The reason for this is that multiple case studies would not necessarily afford the researcher the time to analyse as rigorously as a single case study. This multivariate/embedded approach has been utilised before, in, for example, the Warwick study of strategic change and Mintzberg and Water's study of the grocery business (Eisenhardt, 1989; Yin, 2013).

The literature suggests there is a clear case for sound theoretical derivation from case studies. This is predicated on the theory being "grounded" in evidence, rigorous data collection and analysis, and "thorough reporting of the information" (Glaser and Strauss, 1967; Eisenhardt, 1989; O' Connor, 2018). Equally, it is also accepted that theory derivation may entail revisiting the research questions during the analysis process (Eisenhardt, 1989), and this is why a pragmatic approach to this research is also adopted in order to allow for a variation of what Dey calls "bit by bit" analysis (Dey, 1993).

4.11 Data Generation and Analysis

Interviews

Interviews have been described as *"a purposeful discussion between two or more people"* (Kahn and Cannell, 1957). The main purpose of a research interview is to elicit information about a particular research approach, topic, or paradigm. Issues that arise from qualitative based interviews are typical of emergent, subjectivist based discourse, which will, in turn give rise to pertinent data for analysis. Interviews range from structured formal processes to informal conversational meetings and conversations (Saunders, Lewis and Thornhill, 2009), and can also be presented at various levels between the two.

Semi-structured / in-depth interviews are those in which a specific range of responses may be elicited, and identical questions are asked in similar order (Bryman, 2006). Unstructured interviews usually take the form of informal discussion and are supplemented by observational data gathering (DiCicco-Bloom and Crabtree, 2006) and open-ended topics (Mir and Rahaman, 2003). This reinforces the relevance of semi structured in-depth interviews for this study as they are frequently the only source of data collection for qualitative research work (DiCicco-Bloom and Crabtree, 2006). They also allow flexibility with regard to the progress of the interview, and for open-ended questions, and the emergence of relevant themes which may materialise during the interview session.

As a method of data collection, interviews are uniquely positioned to allow for the collection of data in a pre-emptory fashion. For example, Saunders (2009) suggests before embarking on a research methodology using interviews; the interviewer should be cognisant of the number of interviews to be conducted, their proposed duration, how they will be recorded, and how they will be examined. A high response rate is another advantage of the interview approach, as the respondent is notified in advance of the appointment.

Interviews do have limitations, however. It is time-consuming to transcribe and process the data, there may be inference or bias in the results, and the overall process can be subjective (Bell, 2005). Interviews also require substantial patience and practice if the correct information is to be obtained (Cohen, 1976).

For this research, in-depth interviews were carried out as a method of extracting detailed data from key informants in the organisation. This included opinion, nuances, formal narrative, informal rhetoric and structured detail about the organisation (Boyce and Neale, 2006). This method was also chosen as it afforded the respondent's a chance to speak freely in an atmosphere that was conducive to the respondent's comfort. The researcher travelled to

various locations around the country to meet the respondent at their place of work, or home, restaurants, constituency offices, even sporting environments. This was done in an attempt to make the respondent feel comfortable and foster an environment that was conducive to reflection, and which enabled the respondents to speak freely (Boyce and Neale, 2006).

As a serving member of An Garda Síochána, the issue of reflexivity was evident, and all interviewees were completely aware that the interviews were being conducted by a serving police officer. They were also aware that access to the organisation had been granted by the Head of HR, the Garda Research Unit, and the Garda Commissioner. The interviewer was not known personally to any of the interviewees; however the commonality of occupation was significant insofar as it made the interviewees feel more evident and willing to share their experiences, reflections, anecdotes, and opinions.

As access and permission was granted to interview throughout the organisation, the following figure illustrates the process and the concept of theoretical saturation (Cranfield and Taylor, 2008), insofar as respondents were selected and approached based on the research and information that was being sought. If the data became repetitious, it was a signal to select a new candidate or consolidate and analyse what had already been gathered in terms of the research question and objectives (Figure 17 refers).

Appendix 8 provides details of the interview questions, the rationale behind each and the expected responses based on the research objectives and rank/grade of each key informant.

Figure 17 Data Collection Process

Figure 17 Data Collection Process
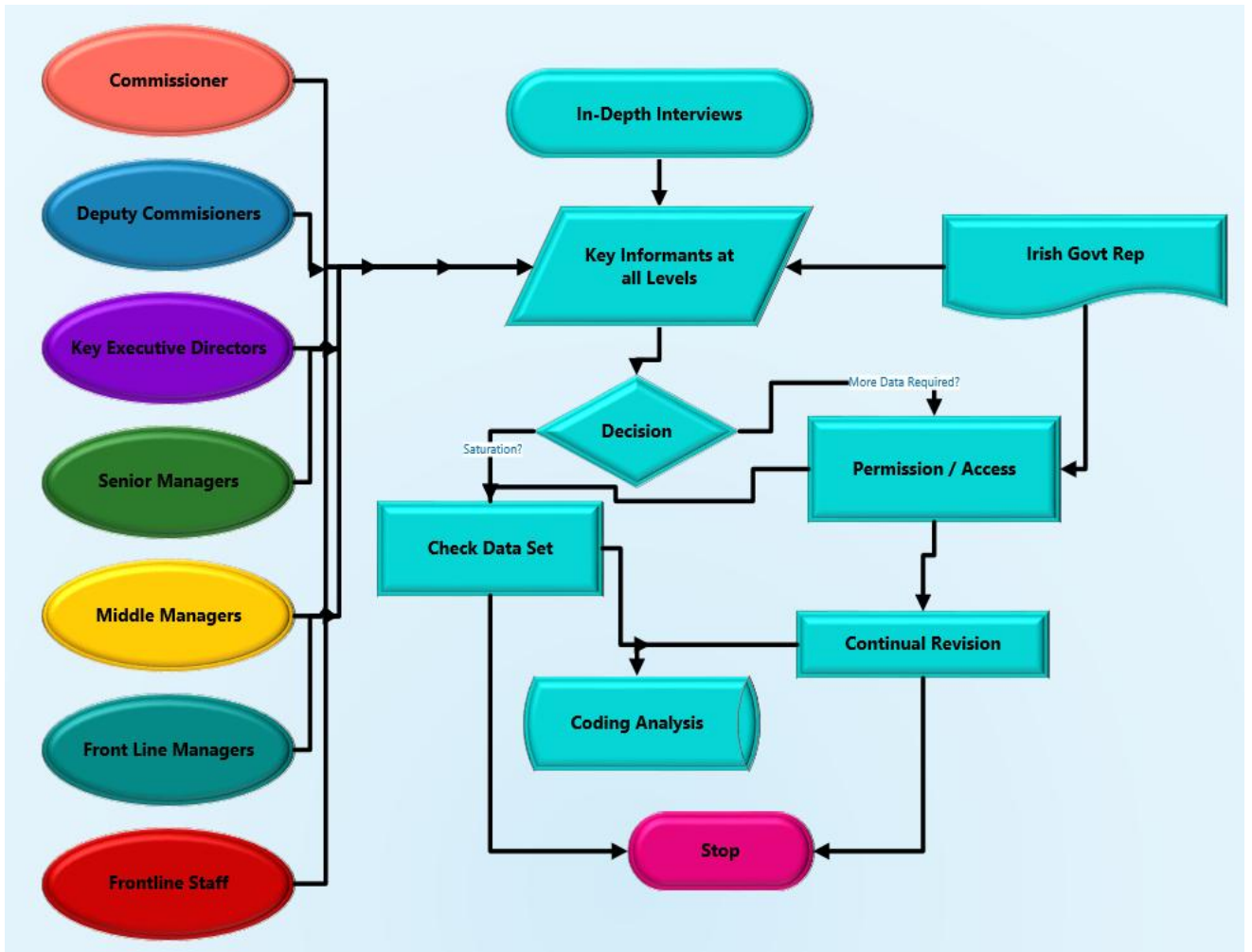
Key Informant Selection

This study interviewed twenty-five key informants from An Garda Síochána and one from the Irish Parliament. They were from all sections of An Garda Síochána, from Comissioners to Civilian heads of departments, operational police officers, administration staff, court officers, press and public relations officers, and a member of the policital accountability section. (please see Appendix 9). The key informants were chosen because they represented the best mix of rank, grade, position, and responsibility to best answer the research question and objectives.

Semi-structured, in-depth interviews were selected for this work because they provided the interviewer and the interviewee with the flexibility to explore different issues while ensuring that the objectives of the interview were achieved by having a basic structure of questions (Bryman, 2012). An interview schedule including an introduction about the research and its objectives was compiled and sent by email to key informants in advance, as was a copy of the questions (see appendix 8). This helped to familiarise respondents with the research project and to provide them with background information about the topics that would be discussed during the interview.

It also gave respondents the opportunity to request modifications to certain questions in order to avoid confidentiality issues. However, since the researcher guaranteed anonymity, no changes to interview questions were requested. Interviews were prescheduled and lasted around 45 minutes to an hour. The researcher used mostly open-ended questions and encouraged respondents to freely elaborate on their answers. Respondents were probed for further explanation when necessary. To avoid response bias, the interviewer avoided leading questions and did not express a personal opinion on any of the matters discussed (Boyce and Neale, 2006). Figure 18 gives an overview of the unparalleled access this research has been given to An Garda Síochána, and Figure 19 breaks this down into specific respondent roles.

Figure 18 Overview of Access to the Organisation
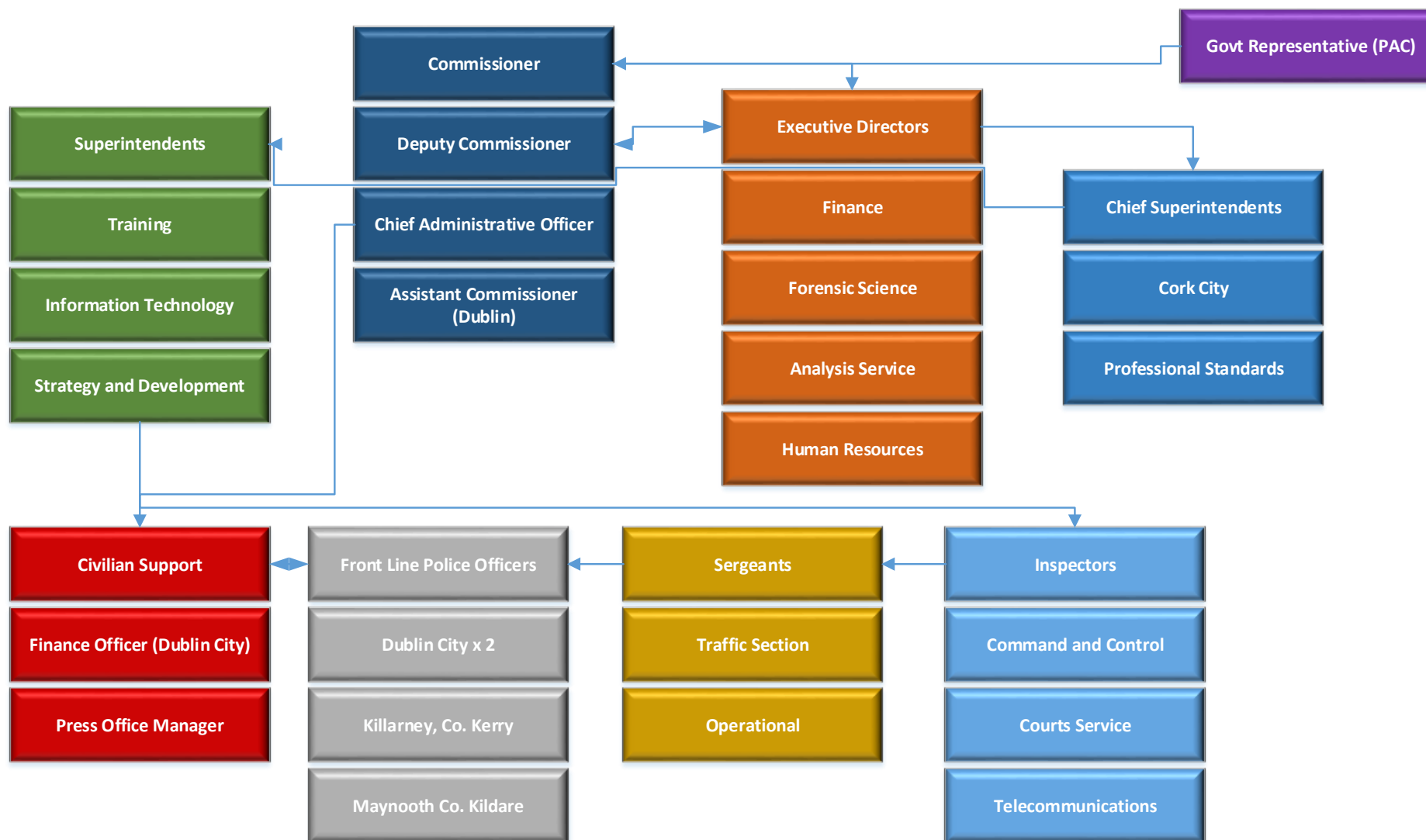
Figure 19 Key Informant Selection (Overleaf)

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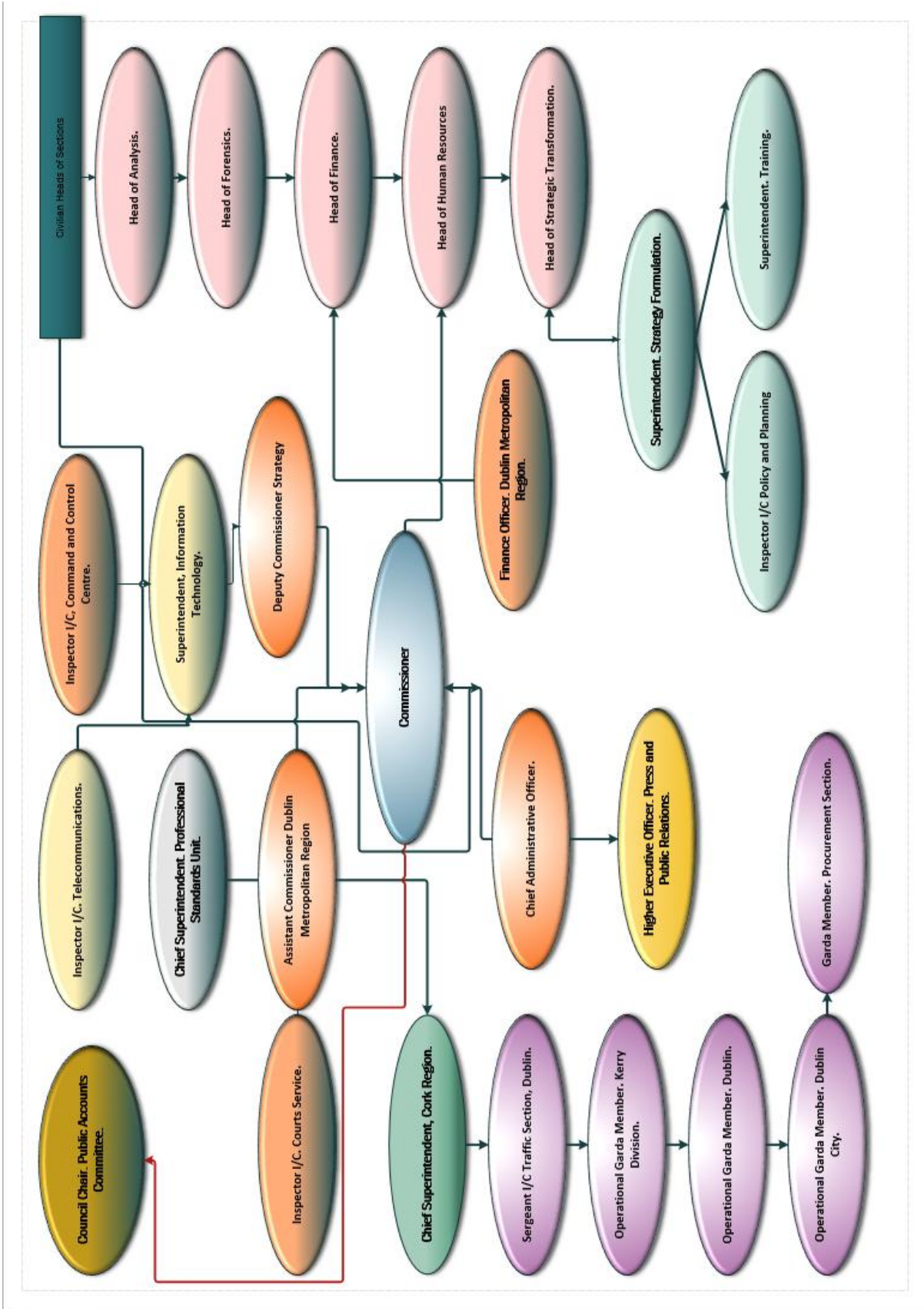
4.12 Coding and Analysis

Process Coding

There are many types of coding that are applicable to qualitative work (Saldaña, 2015); however, in order to elicit data that is not only grounded in rigor but relevance, the choice of coding methodology adopted must be set against the research objectives.

In this case, it has been decided to utilise process coding for the first iteration of coding. Process coding has been labeled "action coding" and employs the use of "gerunds" in order to code towards action and purpose (Jung, 2011; Saldaña, 2015). Process codes can be used in relation to what Jung suggests are "observable actions," as it implies a linear process of emergent themes. These can occur throughout the process of data collection and reflect particular dynamics, be they of individuals, events or sequential (Hennink and Hutter, 2011).

Process coding is suitable for a variety of qualitative studies (Jung, 2011), and according to Corbin and Strauss, it is particularly effective for "ongoing action/interaction/emotion taken in response to situations, or problems, often with the purpose of reaching a goal or handling a problem." Willig has also suggested that process coding has been very effective in "uncovering" rooted processes in data constructs as it can help to identify psychological nuances or intent (Georgaca and Avdi, 2011).

In the case of process coding, it is particularly suited to this research as the research questions are attempting to critically evaluate the role of knowledge and knowledge management in policing. They are also attempting to assess the efficacy of knowledge and knowledge management practices in a policing environment and make recommendations to police management in relation to improvements in knowledge and knowledge management

practices. They will also be used to potentially offer guidance to police forces in relation to these practices.

This means being able to "identify" patterns and processes in the data and what the potential interaction is (in a policing context) between process and outcome and tacit and explicit knowledge. It also entails identifying areas of potential cognitive dissonance that are essential in order to interpret legal, ethical, and moral constraints in the context of effective police work.

In order to commence process coding, each data subject's answers are first transcribed, then, line by line analysed for the specificity of the gerunds. The causality in this process has been espoused by Bernard and Ryan, who have suggested that recording the data subject's responses in a linear fashion will allow for a more accurate reflection of process coding. This includes describing the "historical context of the process in a horizontal matrix, followed by triggers that initiate the main event. Next, the immediate reaction is outlined, concluding with the long term consequences" (Bernard, Wutich and Ryan, 2016).

In the context of the research question and objectives, and in order to carry out process coding, it is proposed to utilise it regarding the following attributes; nuance, inflection, and proposition. This is because it is set against a backdrop of the constant duality of policing and knowledge, that of explicit process versus implicit time-bound decision making, both requiring adept judgment and judgmental skills. Ultimately, process coding should elicit causality, which will then be used to inform the next cycle of coding. In summation, process coding will be used for the following reasons;

1. It is a "first cycle" coding methodology (Saldaña, 2015).

2. It will be utilsed for the consideration of compound interaction (Dey, 1993).

3. It will be used to examine causality in the data (Bernard, Wutich and Ryan, 2016).

In-Vivo Coding

In vivo coding has been described as a coding method which extrapolates meaning from text or nuanced detail from particular meanings or intonations (Strauss, 1987). In Vivo coding is also suitable for coding nuances, meanings, and metaphors in the data corpus (Charmaz, 2014). This makes it suitable for examining the data with a view to extrapolating meaning and direction from the interviews. This will also facilitate possible linkages with theory generation and the research questions. It is also used to "ground" the research in perspective (Saldaña, 2015).

In terms of causality, the data analysis should be linear, and this is underlined by the fact that the process coding highlights the action verbs (gerunds), and then in-vivo coding is utilised in order to add rigour, context, and perspective to these. A view echoed by Saldaña, who suggests that applying coding methodologies "sequentially" gives a "richer perspective on the data set" (Saldaña, 2015). In the case of this research, chapter five will detail the data derived from the process coding cycles. These will then be used to form the bases for the in-vivo coding, which in turn will be used to inform the thematic analysis section of the research. As in vivo coding uses "direct language as codes", it is also suitable as a method to re-inforce the theoretical direction taken in the research (Saldaña, 2015).

The data obtained from this research is unique, rich, and informative, and it is necessary, therefore that the paradigmatic stance adopted by the coding methodology reflects this. This suggests that it should be as rigorous as is necessary in order to answer the research question and objectives in the most comprehensive way possible. Saldaña also contends that if the goal of the researcher is to "develop" new theory, then process and /or in-vivo analysis or coding cycles are recommended (Saldaña, 2015).

Thematic Analysis

Thematic analysis is a reflective qualitative approach that is used in order to convert "qualitative information into qualitative data" (Boyatzis, 1998). In terms of flexibility, it is generally agreed that it allows a theoretical, inductive, and grounded based approach to qualitative data analysis which results from themes generated from coded data (Miles and Huberman, 1994; Braun, V. and Clarke, 2006). The interviews conducted for this work have been analysed by identifying categories and themes from rigorous coding cycles of process and in-vivo coding, and the emergent theory from the data has been the subject of this process (Kalra, Pathak and Jena, 2013; Saldaña, 2015).

Theoretical analysis has been identified as being a "realist / experiential" approach to data analysis (Roulston, 2001), and this has often led to it being confused with discourse or content analysis, as a result of its boundaries not being clearly defined (Braun and Clarke, 2006). As a process however, it is essential that it is elucidated clearly, and its use in this research project is particularly important for the following reasons;

1. Discussing the emergence of "themes" within the data has to be specific, and by implication, has to be more than mere discussion. The researcher must reflect and articulate the process, and the role played in identifying the themes that have been identified (Taylor and Ussher, 2001). In order to present viable theory from this case study, it is essential that the process is based in rigorous analysis so as to facilitate further study and related research (Attride-Stirling, 2001). This is particularly true in order to elicit and design proposed knowledge recommendations and suggest their potential use in the Irish Police Force.

2. The relevance of thematic analysis hinges on the researcher being able to clearly articulate the process of thematic development, and to this end, thematic analysis is a practical process for this work as it can be, as mentioned, realist, contextualist, or experiential. The detailed case study in this work demands that the analysis be as rigorous as the methodology that supports it in order to clearly elucidate the public-sector nuances, ideologies, mandates, expectations, and pressures on law enforcement service providers.

This research has a specific element of causality insofar as both the research and the research methodology are concerned. Firstly, in order to answer the research questions, it is imperative that the "lens" of the public sector is adduced through the literature in order to complete a coherent account of the current state of knowledge management in the public sector and disclose the specific issues that it faces.

Secondly, the methodological approach chosen begins with the articulation of the philosophical stance (pragmatism), which underpins the ethos of the process whilst adding rigour (Kalra, Pathak and Jena, 2013). This will inform the case study and is the reason why theoretical thematic analysis is suitable for this work. Figure 20 illustrates a schematic layout of the coding process and the implications for reference.

Figure 20 Coding Schematic

Figure 20 Coding Schematic
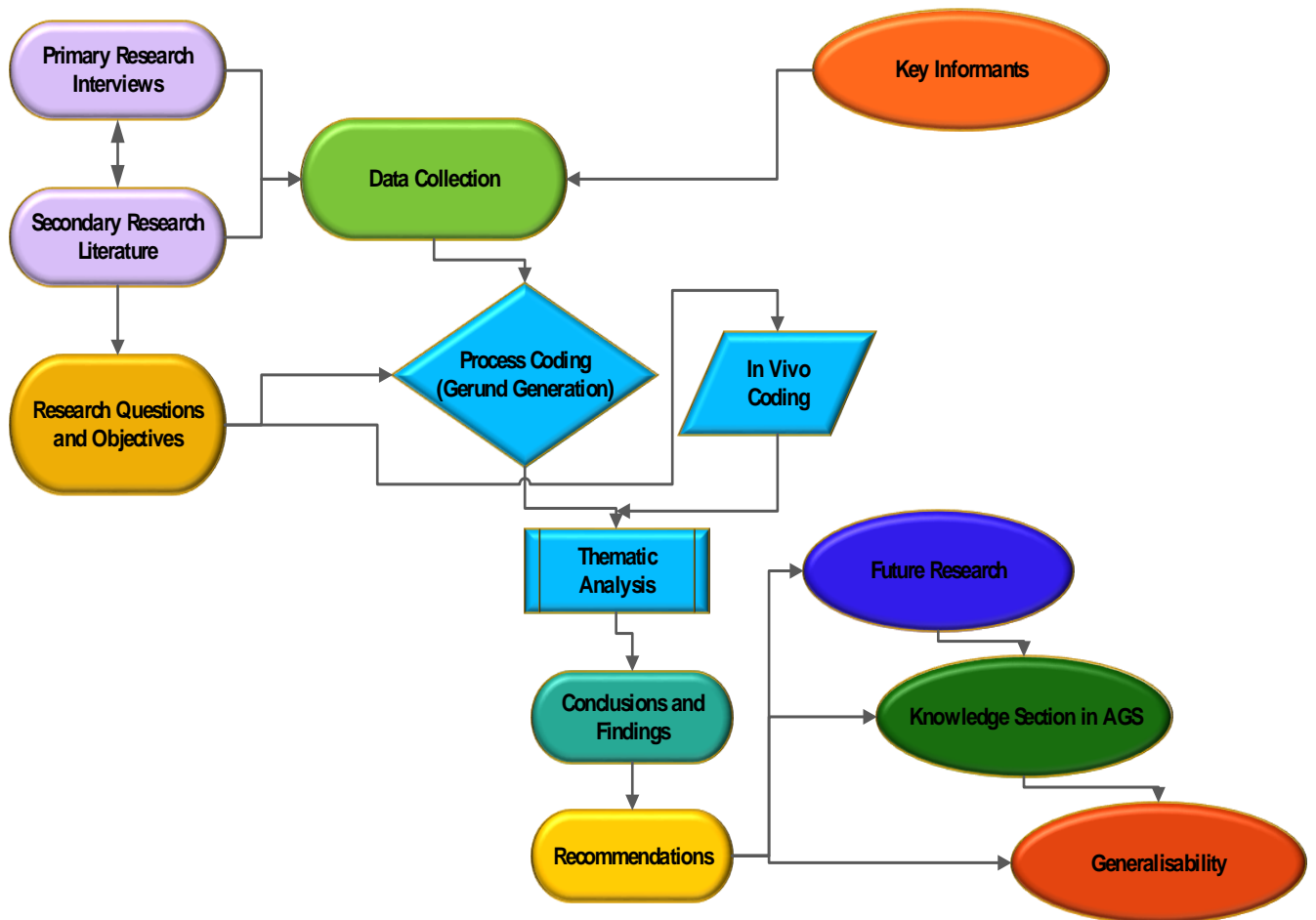
Pragmatism and Thematic Analysis

Using a pragmatic "lens" for this approach involves identifying patterns that appear in the data and relating them to the research questions (Jodi, 1994). The next phase involves amalgamating recurring data or "patterns" into sub-themes, which were (in the case of this research) topics, categories, recurring ideas, thoughts, nuances, reflections, and observations (Taylor and Bogdan, 1984). The themes that are collated from this will form the basis for the findings and the structure of the work. The idea of this stage of the analysis is to form collective themes which are then analysed with a view to organising the themes into clusters (Leininger, 1985).

The themes are then analysed for "coherence" which, according to pragmatic maxims utilises a combination of how best the analyst can see the patterns and discern the relevant issues through experience, detailed study, and ability (Jodi, 1994).

4.13 Reflexivity

Reflexivity, impartiality, and objectivity are all part of the qualitative process, particularly at the data gathering and analysis phases. The reality that objectivism can and does play a part in qualitative research and reciprocity does occur and is a crucial part of the process of accurate reflection (DiCicco-Bloom and Crabtree, 2006), means that the very act of data collection, in turn, is reflexive.

This suggests that the ontological, epistemological or axiological stance of the researcher can affect the research in a number of ways (De Tona, 2006). Firstly, it can have a direct bearing on the empathetic stance of both researcher and participant, as it can be prudent to be reflective not just on the data but on the recognition of the cognitive ability of the researcher to rationalise it in terms of the research questions and objectives (Jung, 2011). Secondly, it means that the researcher is aware of the potential of this phenomenon and how it can affect the relationship between the researcher and the participant, which in effect means that the level of discourse may be affected because of the comfort or discomfort of the participant insofar as divulgence is concerned (Berger, 2015).

Also, the provision of "worldview" is paramount in reflexivity (Berger, 2015). This could suggest bias, which has been stated as one of the weaknesses of qualitative research (Rajasekar, Philominathan and Chinnathambi, 2013). This must be acknowledged in terms of data analysis and theme progression (Vaismoradi *et al.*, 2016), and dealt with in terms of an awareness of the "credibility of the findings, by accounting for researcher values, beliefs, knowledge, and biases" (Cutcliffe, 2003).

The action that one can take in relation to reflexivity is, as mentioned, firstly, to develop an awareness of the phenomenon through its potential to affect reaction, provocation, and expectation (Mason, 1996). This allows for objectivity in the research as it gives the researcher a chance to contemplate potential issues that are arising and question their own accountability and awareness of the data (Lietz, Langer and Furman, 2006).

In the case of this research, the basis for reflexivity was the fact that the researcher is a serving member of An Garda Síochána and a part-time researcher. This duality was essential in some ways as it contributed to the understanding and a lack of "acceptance" of the data without obscurification (Berger, 2015).

Being a serving member of An Garda Síochána could be also be interpreted as a unique (and possibly biased) perspective from which to conduct a piece of research of this nature; however, the entreatment to be reflexive needs to come from critical reflection (Leonard and McAdam, 2001). In this case, the questions the researcher had to introspectively pose were born as much of critical reflection as practicality. The researcher is a serving member of An Garda Síochána; however, the researcher has not been an operational police officer for over fifteen years, reports directly to a civilian Executive Director, and is currently employed in what would be considered an administrative capacity. The research, it is submitted, is all the richer for these phenomena, as they afforded the opportunity to remain both creative and objective (Carson and Coviello, 1996).

These phenomena also resulted in specific parameters that added to the uniqueness of this research. The access gained to the organisation and the range of data obtained from all levels is, it is contended, unparalleled. The interviewees were also open, frank, and honest, and this had a reflexive context, as they identified with the researcher as being one of their own (De Tona, 2006).

This was crucial in that the research and the researcher need to take responsibility for this and recognise that this may reflect the outcome of the research (Stronach *et al.*, 2007). However, it was also accepted that this research would ground the data in three cycles of qualitative coding, which would serve to significantly reduce the possibility of bias and facility objectivity in the results.

With regard to the relationship with the respondents, the researcher was not known personally to any of them and professionally only to two. However, reflexivity also served to assist in the objectivity of the research it allowed the researcher to recognise and filter repetition in the content and reflect on the nuances and details from a constructivist standpoint (Lietz, Langer and Furman, 2006).

It was also fortuitous that the organisation is currently undergoing change initiatives that make it more receptive to initiatives such as the knowledge-based recommendations contained in this work, and the fact that the research has been mandated for potential implementation is a unique opportunity for knowledge in policing going forward.

Reflection is also synonymous with the phenomenon of reflexivity insofar as it should promote self-reflection in the researcher and in the research (Vaismoradi *et al.*, 2016). This can not only lead to a healthy level of questioning but also lend lucidity to the data and serve to promote viable connection between it and the implications for the research (Tracy, 2010). Ultimately, the data in this research was grounded in choice. The choice of the case study based on specific criteria which emanated from a systematic literature review.

The research questions were developed as a result of viable and transferrable potential, namely that of knowledge and knowledge management in the security services and its hitherto undocumented potential for improved performance and service delivery to other comparable police forces. The relevance of this is echoed by Tracy, who suggests the

explanation for reflexivity lies in the successful explication of the topic, which can allow for the development of process causality, which in turn leads to rigorous analysis and data that can be utilised in other areas (Tracy, 2010). This is ultimately what this research is trying to achieve.

Whilst it is crucial to accept that there is no research bereft of bias or a degree of subjectivity (Sword, 1999), it is also essential to realise that this research is all the better for it. If it is accepted that reflexivity is "the active acknowledgement by the researcher that her/his own actions and decisions will inevitably impact upon the meaning and context of the experience under investigation" (Horsburgh, 2003), then it must also be relevant to suggest that the level of introspection it allows for assists the researcher in obtaining data that is rich, relevant and credible (Alvesson, 2000).

4.14 Ethical Considerations.

In general, research ethics refer to the way in which the research is conducted, having regard for the people involved in the research and those for whom the research affects. If this was a simple axiological process of "social inquiry" (Saunders, Lewis and Thornhill, 2009), then it could be taken at face value. But cognisance must be taken of the potential effect of the research on the individuals and the organisation being researched in a number of contexts, morally, professionally, and personally (Bryman and Bell, 2015).

In the case of this research, ethical approval was sought and granted from the Ethics Research Committee (formally of Dublin Institute of Technology, now Technological University, Dublin). After meeting with the Executive Directors of Garda and Civilian Human Resources in Garda HQ. The researcher and his supervisor were directed to apply for permission to gather data from the Research Unit in An Garda Síochána College in Templemore, Co. Tipperary.

This researcher worked closely with the Garda Researcher in Templemore in relation to this work. The data gathered from the Research Unit included the potential for this research to be viable, the best way to gain access to the various heads of sections, the approval process, and the permissions needed to gain access. Several visits had to be undertaken to in order to ensure that access to the organisation was approved. Reflexivity was also discussed and the implications of same were made explicit, as were the processes around data analysis and coding. The researcher and supervisors had to meet with the Garda Commissioner in the Research Unit in order to ensure that all parties were satisfied with the proposed direction of the research and the potential of the data to be unique, substantial, and possibly controversial. Because of this, its potential impact on the organisation had to be made clear, and this made discretion mandatory.

The researcher and supervisors then met with the heads of Human Resources (both Garda and Civilian), and the head of the Research Unit to discuss how to proceed with the access that had been granted. A plan was drawn up that involved the Research Unit disseminating a confidential memo to all heads of the organisation (both Garda and Civilian, to the effect that this study had been approved by the Commissioner, and that if requested, to think favourably on granting an interview to the researcher. It should be stressed that participation in the study was not mandatory; it was at the discretion of the interviewee. However, this unprecedented step meant that all heads of departments were aware of the approval granted and could make their own decision as to whether or not to participate themselves or allow their staff to participate.

As expected, confidentiality was key throughout the process, as the potential to obtain sensitive data was extremely high. AGS Protocol for research (Appendix 11) had to be completed and approved. Going forward, the Research Unit will be working closely with the researcher and his supervisors in order to implement a new knowledge management section.

It is anticipated that this will be based in the Garda Training College in Templemore and the researcher will be temporarily transferred to this location in order to assist in its implementation.

After the access was granted, key informants were then contacted directly and asked to participate in the research. All agreed. The researcher provided a copy of the practitioner information sheet (appendix 6), which confirmed the anonymity of the respondents and acknowledged the fact that they could withdraw at any stage before, during, or after the process. Academic integrity was also maintained through the project by ensuring that any data or content that did not emanate from the research or researcher directly was properly cited.

4.15 Dissemination of research findings

The subject matter of this research has been presented at two international conferences and published in two academic journals. The taxonomic groupings of public sector attributes were published at the International Forum on Knowledge Asset Dynamics and the European Conference on Knowledge Management. The work was also published in the journals "Electronic Journal of Knowledge Management" and "Knowledge Management Research and Practice."

An Garda Síochána has indicated that it may implement some or all of the recommendations offered as a result of this research. This will form the basis of future work and collaboration between TU Dublin and An Garda Síochána.

4.16 Thesis Presentation

This thesis and its associated findings were compiled in accordance with an outline as espoused by Saunders, which is simple but effective and focuses the reader on simple causality (Saunders, Lewis and Thornhill, 2009). This involved developing an answer to a proposed research question or gap and providing evidence that the gap could be reduced by the research. In the case of this research, the gap is the lack of focused literature in the public sector knowledge management field, particularly in the areas of the emergency services, and the lack of existing knowledge and knowledge practices in policing.

This is answered by an in-depth exploratory case study and analysis, leading to specific findings and a useable set of knowledge recommendations for knowledge management, which can be generalised to other police forces (in this case), and ultimately, other public service bodies.

Reflecting on the insight gained will not be a matter of presenting the data, but rather, recognition of the extent to which the data can be generalised. It is hoped that this research will invite the reader to engage with the comparative analysis process, which will lead to a contextual appraisal and ultimately, (from a naturalistic generalisability standpoint) allow for valid coherence of that analysis (Melrose, 2009).

Yins "replication strategy" (Miles and Huberman, 1994) suggests a leaning towards a classical grounded theoretical approach. In this case, however, this is born as much of replicated pattern analysis as "interpretive synthesis," which involves the extrapolation of consensus among the cases prior to "re-imaging" the results to addend to the original work (Denzin, 2001). Causality (from an analytical perspective) could allow for continuous iterative cycles to be assessed and *requires* an element of capability from the researcher, not just in terms of comparative analysis but interpretive analysis. This makes for a malleable

approach and one is able to take cognisance of and ultimately account for derivations in theoretical generation because it can be revisited and continually tested against the data, categories, and theoretical contexts (Bryant and Charmaz, 2007).

4.17 Conclusion

This chapter highlights the research methodology used in this study and examines the justification for employing the research design. This design is appropriate for answering the research question and the objectives for the following reasons;

1. An Garda Síochána represents a typical public sector service and displays specific public-sector nuances indicative of other police forces. This research, therefore, has the potential for generalisability, and the methodological constructs utilised can also be applied to further work.

2. This exploratory case study meets the criteria necessary for adopting a purposive stance on the analysis, as it meets the conditions necessary to answer the research question and objectives. It also infers a high degree of generalisability to the findings and recommendations (Darke, Shanks and Broadbent, 1998; Yin, 2013).

Hans Eysenck (1976), who originally did not regard the case study as anything other than a method of producing anecdotes, later realised that "sometimes we simply have to keep our eyes open and look carefully at individual cases, not in the hope of proving anything, but rather in the hope of learning something!"

Chapter 5 Empirical Data Analysis

5.1 Introduction

This chapter brings together the data gathered from this research and analyses it using three cycles of qualitative coding. The chapter begins by outlining the breakdown of the respondent spread, including role, rank, and whether or not the staff member is a civilian or Garda member. The chapter then introduces the specifics around the data collection (Section 5.3) and discusses the three cycles of process, in-vivo, and thematic analysis in detail. The purpose of this chapter therefore is to present the salient data for the work and to illustrate the results clearly. These results are clearly positioned against the research questions; moreover, the results of the first level of coding are presented against delineated strata of front line and leadership / management staff. Building on the first cycle of coding, and extrapolating the gerunds generated, In-Vivo coding is then introduced, which builds on the previous level to include nuanced detail and meaning. Examples of these codes are presented; however, the full texts are contained in appendix 2, which for reasons of confidentiality, cannot be included in the final edition of this work. Thematic analysis is then introduced, and the chapter concludes with an overview of the initial findings. These are then detailed in the concluding chapter.

The rationale behind utilising a purely qualitative approach has been detailed in chapter 4. However, by way of introduction, Flick's explanation of qualitative data analysis affords the reader some clarity around the topic. He suggests it is "the interpretation and classification of linguistic (or visual) material with the aim of "making statements about implicit and explicit dimensions and structures of meaning-making in the material and what is represented in it" (Flick, 2018). It is also suggested that qualitative data analysis brings together a combination

of summary interpretative process with more detailed categorical analysis and comparison, which leads to a layered analytical approach (Saldaña, 2015; Flick, 2018).

As detailed in chapter four, secondary data was gathered by way of a systematic literature review and primary data as a result of twenty-six in-depth interviews conducted with key informants at all ranks of An Garda Síochána. A member of the Irish political public accounts committee, which has oversight of AGS was also interviewed.

This chapter presents the methodology used in the data analysis and the process used to inform the results. To do this successfully, it is pragmatic to objectify the qualitative approach used in this work. If this is carried out in a methodologically defendable way, it will lead to an awareness of both the existing knowledge practices in the organisation, and the potential implications of practical suggestions based on the data. This will also lead to the practical interpretation of the phenomena discovered during this process (Leech and Onwuegbuzie, 2007).

Before embarking on a process of data analysis, however, Saldaña suggests several avenues that should be explored. These include the ability to utilise process, think critically, synthesize, evaluate, and abduct the data from the source or sources (Saldaña, 2015). It should also be borne in mind that the rigor underpinning qualitative data analysis can be obtained by utilising what Saldaña calls "an extensive vocabulary". This is further suggested to be analogous to quantitative metrics in that it calls for the qualitative researcher to be interpretive, deductive and, ultimately, cognitive (Saldaña, 2015).

5.2 Qualitative data and police work.

Notwithstanding specific public-sector nuances as detailed in chapter two and the concept and context of police knowledge management as discussed in chapters two and three, data analysis needs a "starting point" (Miles and Huberman, 1994). It also requires context which is set by the research questions and objectives.

Moreover, police knowledge management and the analysis of the data concerned with this research must be framed by the research question and objectives in order to imbue the data analysis with direction. This makes this work ideally suited to qualitative oriented analysis as it is situated firmly within the area of discourse analysis (please see section 4.5 for further discussion).

5.3 The Coding Imperative

According to Miles and Huberman, coding allows for the derivation of "prompts and triggers" that enable further inquiry from the meaning of the data (Miles and Huberman, 1994). Coding has also been described as the bridge that connects data collection and theory derivation (Charmaz, 2009). This defines the foundation with which to build a theoretical framework or process from which to answer the research questions and objectives of a study.

Saldaña describes coding in two distinct stages, first and second cycle coding (Miles and Huberman, 1994; Saldaña, 2015). First cycle coding is generally utilised to gather the data in large portions before it is refined through second cycle coding analysis. However, coding can also be an open process and one in which any form of analysis may be used, provided it is rigorous, relevant, and properly grounded in the data (Miles and Huberman, 1994). For example, "systematic coding" looks for themes and outlines in the data (Hsieh and Shannon, 2005). Open-coding (Mishra and Bhaskar, 2011) looks across the entire data corpus, and theoretical coding can be used to derive theory from previous coding cycles (Saldaña, 2015). Ultimately the qualitative researcher can decide on the coding constructs to support their data (Howe, 1988) if, as mentioned, they are consistent and rigorous.

An awareness of the potentiality of quantitative analysis is essential to the qualitative researcher, however, as some level of measurement is invariably conducted in any study. This may be only to count the number of interviews, the number of participants, the amount of data coding constructs, or the longitudinal aspect of the research. This can lead to ambiguity in the difference between quantitative and qualitative research, particularly at the data level, where Howe suggests, some ambiguity is, arguably, inevitable (Howe, 1988). The key factor is the recognition that qualitative analysis cannot exist in a vacuum and that this awareness is reflected in the analysis.

To do this effectively, it is imperative that a process is invoked and that it is adhered to in order to provide consistency across the data analysis. Given the nature and nuances of police knowledge and knowledge management, it is imperative that "questions of practicality" (Miles and Huberman, 1994) are addressed before the process of data analysis gets underway. These include;

1. What could be construed as a "reasonable timeframe" within which to gain access to the data subjects, and will there be a necessity to "re-interview" depending on the direction of the data findings?

2. What are the logistical issues and problems that have to be overcome in order to access the data subjects?

3. What existing information is required to be qualified before the data analysis takes place?

In relation to each of the above issues, the data was collected over eighteen months. The logistical issues are presented in appendices 11-14 (inclusive), and the existing information required for qualification before data analysis takes place has been comprehensively detailed in chapter two.

Any level of qualitative data analysis should begin with a concise level of introspection (Bernard, Wutich and Ryan, 2016), and pertinent reflection. With regard to this research, the comparative analysis will be based on the research question and objectives and the analysis of the results that emerge from the data (Campbell, 1978).

The initial range of tables indicates the respondent spread from several perspectives, firstly by gender;

Table 10 Breakdown of Respondents by Gender (overleaf)

Person	Civilian	Frontline	Garda	Gender	Manager	Position
Frontline Gda	No	Yes	Yes	Female	No	Frontline Garda Member
Political	Yes	N/A	No	Female	No	Head of Political Accounts Committee
Frontline Gda	No	Yes	Yes	Female	No	Frontline Garda Member
Civilian Staff	Yes	N/A	No	Female	No	Press Officer
Civilian Staff	Yes	N/A	No	Female	Junior	Finance Supervisor
Gda Manager	No	Yes	Yes	Male	Senior	Assistant Commissioner DMR
Ex Manager	Yes	No	No	Male	Senior	Head of HR
Gda Manager	No	Yes	Yes	Male	Senior	Chief Superintendent. Frontline Division
Gda Manager	No	Yes	Yes	Male	Junior	Head of the Communications Centre
Ex Manager	Yes	N/A	No	Male	Senior	Head of Forensics
Gda Manager	No	Yes	Yes	Male	Senior	Chief Superintendent. Professional Standards
Gda Supervisor	No	Yes	Yes	Male	Junior	Sgt I/C Traffic Section
Gda Manager	No	No	Yes	Male	Senior	Head of the Organisation
Frontline Gda	No	Yes	Yes	Male	No	Frontline Garda Member
Gda Manager	No	No	Yes	Male	Senior	Deputy Head of the Organisation
Ex Manager	Yes	N/A	No	Male	Senior	Head of Strategic Transformation
Gda Manager	No	Yes	Yes	Male	Junior	Junior Manager Frontline Garda Member (Inspector)
Ex Manager	Yes	N/A	No	Male	Senior	Head of Garda Analysis Service
Frontline Gda	No	Yes	Yes	Male	No	Frontline Garda Member
Ex Manager	Yes	No	No	Male	Senior	Chief Administrative Officer
Ex Manager	Yes	N/A	No	Male	Senior	Head of Finance
Gda Manger	No	No	Yes	Male	Middle	Junior Manager. Telecoms Section (Inspector)
Gda Manager	No	No	Yes	Male	Middle	Superintendent. In Charge of Training
Gda Manager	No	No	Yes	Male	Middle	Superintendent. In Charge of IT
Gda Manager	No	No	Yes	Male	Middle	Superintendent. Garda HQ
Gda Manager	No	Yes	Yes	Male	Middle	Head of the Courts Service

This indicates a split of approximately 20% female respondents, however, given the organisations overall gender split (approximately 26% female to 74% male, see chapter 6), this is somewhat reflective of the overall gender breakdown in the organisation. The respondent selection was based on role responsibility and position; however, it is presented in the following tables for reference and detail, rather than an indication of any distinction in analysis or data.

If we examine the spread of roles in the respondent selection, we can see that nine male respondents would be considered "frontline" members of the organisation who have served in urban and rural areas. That is to say, they are directly involved with dealing with the public and utilising police "powers," such as directly enacting legislation or interpreting statute.

Table 11 Male Frontline Police Officers

Person	Civilian	Frontline	Garda	Gender	Manager	Position
Gda Manager	No	Yes	Yes	Male	Senior	Assistant Commissioner DMR
Gda Manager	No	Yes	Yes	Male	Senior	Chief Superintendent. Frontline Division
Gda Manager	No	Yes	Yes	Male	Junior	Head of the Communications Centre
Gda Manager	No	Yes	Yes	Male	Senior	Chief Superintendent. Professional Standards
Gda Supervisor	No	Yes	Yes	Male	Junior	Sgt I/C Traffic Section
Frontline Gda	No	Yes	Yes	Male	No	Frontline Garda Member
Gda Supervisor	No	Yes	Yes	Male	Junior	Junior Manager Frontline Garda Member (Inspector)
Frontline Gda	No	Yes	Yes	Male	No	Frontline Garda Member
Gda Manager	No	Yes	Yes	Male	Middle	Head of the Courts Service

(Source; Compiled by Author)

Two of the respondents are female members who are frontline police officers in various stations and have served in rural and urban areas.

Table 12 Female Frontline Police Officers

Person	Civilian	Frontline	Garda	Gender	Manager	Position
Frontline Gda	No	Yes	Yes	Female	No	Frontline Garda Member
Frontline Gda	No	Yes	Yes	Female	No	Frontline Garda Member

(Source; Compiled by Author)

Ten of the respondents occupy senior management roles, which range from various heads of departments to those who have responsibility for running the various areas within the organisation, and ultimately, to those running the entire organisation.

Table 13 Senior Managers in An Garda Síochána

Person	Civilian	Frontline	Garda	Gender	Manager	Position
Gda Manager	No	Yes	Yes	Male	Senior	Assistant Commissioner DMR
Ex Manager	Yes	No	No	Male	Senior	Head of HR
Gda Manager	No	Yes	Yes	Male	Senior	Chief Superintendent. Frontline Division
Ex Manager	Yes	N/A	No	Male	Senior	Head of Forensics
Gda Manager	No	Yes	Yes	Male	Senior	Chief Superintendent. Professional Standards
Gda Manager	No	No	Yes	Male	Senior	Head of the Organisation
Gda Manager	No	No	Yes	Male	Senior	Deputy Head of the Organisation
Ex Manager	Yes	N/A	No	Male	Senior	Head of Strategic Transformation
Ex Manager	Yes	N/A	No	Male	Senior	Head of Garda Analysis Service
Ex Manager	Yes	No	No	Male	Senior	Chief Administrative Officer
Ex Manager	Yes	N/A	No	Male	Senior	Head of Finance

(Source; Compiled by Author)

The gender reflection, in this case is not indicative of the overall gender split in senior management roles, rather the roles selected reflected the relevant sections of the organisation from which it was felt the most pertinent data could be obtained, given the research objectives (Appendix 9 refers).

Five of the respondents occupy middle-ranking management positions. Four occupy junior management positions, and three occupy frontline / administrative or political positions.

Table 14 Middle Ranking Members of An Garda Síochána

Person	Civilian	Frontline	Garda	Gender	Manager	Position
Gda Manager	No	No	Yes	Male	Middle	Junior Manager. Telecoms Section (Inspector)
Gda Manager	No	No	Yes	Male	Middle	Superintendent. In Charge of Training
Gda Manager	No	No	Yes	Male	Middle	Superintendent. In Charge of IT
Gda Manager	No	No	Yes	Male	Middle	Superintendent. Garda HQ
Gda Manager	No	Yes	Yes	Male	Middle	Head of the Courts Service

(Source; Compiled by Author)

Table 15 Junior Managers in An Garda Síochána

Person	Civilian	Frontline	Garda	Gender	Manager	Position
Civilian staff	Yes	N/A	No	Female	Junior	Finance Supervisor
Gda Manager	No	Yes	Yes	Male	Junior	Head of the Communications Centre
Gda Supervisor	No	Yes	Yes	Male	Junior	Sgt I/C Traffic Section
Gda Manager	No	Yes	Yes	Male	Junior	Junior Manager Frontline Garda Member (Inspector)

(Source; Compiled by Author)

The mix of Garda and Civilian (Garda staff) members is shown in the table below which indicates a ratio of 65.8% Garda staff or civilian members to 34.2% Garda "sworn" members.

Table 16 Garda Respondents

Person	Civilian	Frontline	Garda	Gender	Manager	Position
Frontline Gda	No	Yes	Yes	Female	No	Frontline Garda Member
Frontline Gda	No	Yes	Yes	Female	No	Frontline Garda Member
Gda Manager	No	Yes	Yes	Male	Senior	Assistant Commissioner DMR
Gda Manager	No	Yes	Yes	Male	Senior	Chief Superintendent. Frontline Division
Gda Manager	No	Yes	Yes	Male	Junior	Head of the Communications Centre
Gda Manager	No	Yes	Yes	Male	Senior	Chief Superintendent. Professional Standards
Gda Supervisor	No	Yes	Yes	Male	Junior	Sgt I/C Traffic Section
Gda Manager	No	No	Yes	Male	Senior	Head of the Organisation
Frontline Gda	No	Yes	Yes	Male	No	Frontline Garda Member
Gda Manager	No	No	Yes	Male	Senior	Deputy Head of the Organisation
Gda Manager	No	Yes	Yes	Male	Junior	Junior Manager Frontline Garda Member (Inspector)
Frontline Gda	No	Yes	Yes	Male	No	Frontline Garda Member
Gda Manager	No	No	Yes	Male	Middle	Junior Manager. Telecoms Section (Inspector)
Gda Manager	No	No	Yes	Male	Middle	Superintendent. In Charge of Training
Gda Manager	No	No	Yes	Male	Middle	Superintendent. In Charge of IT
Gda Manager	No	No	Yes	Male	Middle	Superintendent. Garda HQ
Gda Manager	No	Yes	Yes	Male	Middle	Head of the Courts Service

(Source; Compiled by Author)

Table 17 Civilian Respondents

Person	Civilian	Frontline	Garda	Gender	Manager	Position
Political	Yes	N/A	No	Female	No	Head of Political Accounts Committee
Civilian Staff	Yes	N/A	No	Female	No	Press Officer
Civilian Staff	Yes	N/A	No	Female	Junior	Finance Supervisor
Ex Manager	Yes	No	No	Male	Senior	Head of HR
Ex Manager	Yes	N/A	No	Male	Senior	Head of Forensics
Ex Manager	Yes	N/A	No	Male	Senior	Head of Strategic Transformation
Ex Manager	Yes	N/A	No	Male	Senior	Head of Garda Analysis Service
Ex Manager	Yes	No	No	Male	Senior	Chief Administrative Officer
Ex Manager	Yes	N/A	No	Male	Senior	Head of Finance

(Source; Compiled by Author)

Figure 21 Civilian Staff Percentages of Various Police Forces
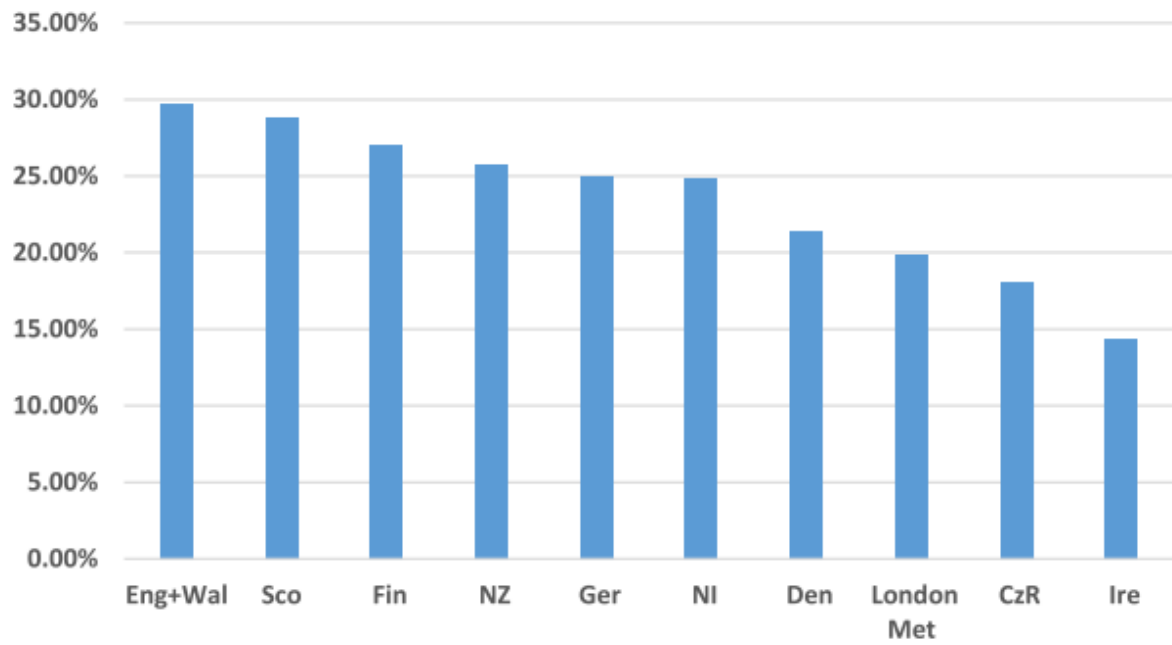
(Source; Gavin, 2018)

5.4 Process Coding; Frontline Policing Staff

Concerning process coding, the data collected from front line police officers will be examined in the context of two main issues. The first one is the purpose, which to re-iterate, is to effectively take out "ongoing action/interaction and emotion in response to situations, or problems, often with the purpose of reaching a goal or handling a problem" (Strauss and Corbin, 1998). The second one is to examine the causality of the gerunds in light of the research questions. An example of the gerunds generated is shown in Table 19 and a further example can be found in appendix 3.

Within process coding, there have been three other areas examined, and these have been analysed in order to present a salient reflection and context to the specificity of the gerunds, as seen in table 19. This is to reflect, as Bernard et al. points out, a more accurate reflection of the process coding progression. This includes the triggers that initiate the gerund, the reaction and the potential outcome (Bernard, Wutich and Ryan, 2016).

The triggers, reactions, and consequences will be utilised to form context before moving on to the second cycle, "in-vivo" coding (Saldaña, 2015). However, at the beginning of this process, it is important that the data collected is reflected in the overall context of the research, and that is to facilitate the unique "insider view" of knowledge management in policing that this research offers. This is also to address the research objectives as comprehensively as possible. The following tables represent a sample of the process coding procedure and are presented in order to illustrate the rigour of the process, including the generation of gerunds from the process coding.

Table 18 Process Coding (Table 1, Overleaf)

C	Gerunds	Triggers	Reactions	Consequences	RQ	RO1	RO2	RO3	RO4
And that is why it is important for AGS to retain its identity? It is quite unique, and they don't even have it in Britain, like our closest neighbours, culturally and all of that they are still very much more into enforcement kind of stopping people if their brake lights out and all of that, I think we have a very unique police force here, even police forces the wrong term, we police by consent, we are not law enforcement, and it would be a shame to lose it, to be brought into a European kind of model. • Would you see a policing service is ultimately accountable to the government or the public? That is a good question I think there are people, I would like to see because my own personal accountability when I came through the job was to the public. And that is just me okay then but if I want to get on in the job I have to look at how the organisation is accountable to the hierarchical structures within itself. It is both, it has to be both, but it has to be the people who see themselves as accountable and ultimately to their paymasters. • Do you think this opinion may change as a police officer becomes more senior? Yes, because you would be considered "an executive" at the executive level of the organization. Absolutely again because you are going up into a completely different role and it is hard to reconcile some of the real world aspects of policing with the corporate aspects, and a lot of people find that there is a very tangible disconnect between policing on the ground, and management. • Given the predominance of information technology, and in the context of the communications section, and you feel about the relevance and security of data? It it has taken over a lot of the police service and I would suggest that it is a good thing. As a police officer I like to have all of the information that I can get and as a citizen I think it is important that I have all of the information that I am entitled to. Because of the tools that we can use for example we can trace people. So there is a murder, and there is an incident room set up, and everyone is allocated various jobs, So initially at the low level, "who saw it?" What we need to do to trace phones et cetera. It is very important for a trial that all of that information comes in. The defence is also entitled to all of the information that is there. But say a knock-on effect of that is that people do not ring 999 is much. You might not believe that but it is actually true. Because people are afraid that they will be asked to present themselves statements, be part of court proceedings et cetera. This is a form of risk aversion or as people may see it, self-preservation. And our newer cadre of police officers are more risk averse themselves given the predominance of accountability and accountability frameworks that permeate our organization.	Reconciling disparate mandates.	Complexity of mandate	Role specificity of policing. Unnessessarily complex?	Risk aversion	What is the role and contribution of knowledge and knowledge management practices in policing. The case of An Garda Síochana.	To critically evaluate the role of knowledge and knowledge management in policing	To assess the value of knowledge and knowledge management practices in policing	To make recommendations to police management in relation to improvements in existing knowledge and knowledge management t practices	To offer guidance to police forces in similar size countries relation to knowledge and knowledge management practices.

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	Gerunds	Triggers	Reactions	Consequences
7				
8	**Gerunds**	**Triggers**	**Reactions**	**Consequences**
	Utilising technology. Streaming technology	Lack of technology capability	awareness of the results of information assimilatio n and disseminati	Technology support leading to potential knowledge dissemination
9				
10				
11	**Gerunds**	**Triggers**	**Reactions**	**Consequences**
	Protecting. Firefighting. Reacting	Lack of knowledge antecedents	Ad-hoc individual knowledge processes	Specialised individual knowledge holders
12				
13				
14	**Gerunds**	**Triggers**	**Reactions**	**Consequences**
	Utilising resources.	Development of personnel	Public sector values impeding progress?	Complexity of delivery
15				
16				
17	**Gerunds**	**Triggers**	**Reactions**	**Consequences**
	Pressurising. Overseeing.	Lack of support for the police officer on the front line	Anger. Frustration	Lack of clear mandate
18				
19				
20	**Gerunds**	**Triggers**	**Reactions**	**Consequences**
	Innovating. Reacting. Discretion. Personal networkiing	Public need. Governance	Networking. Informal reaction	Task completion. Illustrating that tacit knowledge is key in some
21				
22				
23	**Gerunds**	**Triggers**	**Reactions**	**Consequences**
	Informal direction and experience	Necessity. Lack of commonality with European counterparts	Utilising resources to make this happen	Job gets done
24				
25				
26	**Gerunds**	**Triggers**	**Reactions**	**Consequences**
	Reconciling disparate mandates.	Complexity of mandate	Role specificity of policing. Unnessessa rily	Risk aversion
27				
28				
29	**Gerunds**	**Triggers**	**Reactions**	**Consequences**
30	Information gathering. Committing.	Security. Informaiton ownership	security of information	Awareness of security issues

Table 19 Process Coding (Table 2)

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Table 20 Process Coding Frontline Police Officers

	Person	Civilian	Frontline	Garda	Gender	Manager	RQ1 KM Practices	RQ2 KM Evaluation	RQ 3 KM Recommendations
1	Frontline Gda	No	Yes	Yes	Female	No	Losing knowledge. Restricting knowledge practices. Strategy.	Effective Knowledge and information utilisation.	Utilise knowledge experts. Progress knowledge and learning. Transfer knowledge.
2	Frontline Gda Manager	No	Yes	Yes	Male	Senior	Knowledge misuse and misinterpretation. Unwillingness to change. Ability	Recognition of seniority. Effective strategising. Recognising knowledge ability	More knowledge awareness. Delivery of knowledge initiatives.
3	Frontline Gda Manager	No	Yes	Yes	Male	Senior	Co-ordinating, replicating processes. Questioning existing practices. Knowledge Loss.	Judging. Allocating resources. Ranking knowledge assets. Supporting knowledge decisions. Structuring knowledge	Training. Educating. Supporting knowledge practices. Implementing knowledge. Overseeing knowledge initiatives. Succession planning.
4	Frontline Gda Manager	No	Yes	Yes	Male	Junior	Personal networking. Disparate practices. Utilising technology. Knowledge Networking	Reconciling knowledge practice. Informal knowledge gathering. Fire fighting. Reacting	Protecting knowledge resources. Assessing knowledge risk. Committing to knowledge practice.
5	Frontline Gda	No	Yes	Yes	Female	No	Losing knowledge. Lacking knowledge. Soloing.	Knowledge evaluation. Combining knowledge with experience. Soloing	Individualising knowledge. Supporting knowledge initiatives.
6	Frontline Gda Manager	No	Yes	Yes	Male	Senior	Accrediting and standardising knowledge. Accessing knowledge. Policing by consent. Relying on knowledge. Sharing knowledge.	Autotomising knowledge. Exchanging information. Classifying knowledge practice.	Personalising knowledge. Analysing knowledge. Measuring knowledge. Governing knowledge practices. Embedding knowledge

	Person	Civilian	Frontline	Garda	Gender	Manager	RQ1 KM Practices	RQ2 KM Evaluation	RQ 3 KM Recommendations
7	Frontline Gda Manager	No	Yes	Yes	Male	Junior	Deploying resources based on best practice. Assessing knowledge. Reducing paperwork. Supporting information initiatives	Resourcing knowledge practices. Passing on knowledge. Championing knowledge.	Formalising roles. Motivating. Implementing knowledge utilising technology.
8	Frontline Gda	No	Yes	Yes	Male	No	Training. Transferring information. Formalising knowledge. Tacit knowledge	Quantifying localised knowledge. Disseminating knowledge	Knowledge used to protect. To instruct. Self-promoting knowledge. Recognising individualism.
9	Frontline Gda Manager	No	Yes	Yes	Male	Junior	Personal networking. Communicating. Resource deployment. Knowledge loss. Learning.	Overuse of statistics. Policy enactment.	Identifying knowledge. Reduce statistical dependence. Policy. Role Complexity.
10	Frontline Gda	No	Yes	Yes	Male	No	Knowledge sharing. Knowledge resourcing. Transferring knowledge	Self-Regulation. Recruitment. Knowledge adaptation.	Embedding knowledge. Allocating resources. Training. Preparing. Discretion.
11	Frontline Gda Manager	No	Yes	Yes	Male	Middle	Sharing knowledge. Capturing knowledge. Condensing knowledge. Transferring knowledge.	Overcoming issues through knowledge practice. Communicating decisions.	Innovating. Improving. Effective deployment of resources. Shadowing. Improvising

(Source; Compiled by Author)

Table 21 Word Returns, Frontline Police Officers.

Word	Length	Count	Weighted Percentage (%)	Similar Words
knowledge	9	411	1.69	ability, acceptance, appearance, attitude, capability, case, creativity, culture, direction, education, example, expectation, experience, feeling, head, individualism, inexperience, influence, information, initiative, initiatives, innovation, instance, intent, interpretation, isolation, issue, knowledge, lead, learn, learned, learning, level, life, mentality, movement, organisation, particular, pattern, perspective, place, potentiality, practice, process, reaction, reality, recognition, regard, remit, retention, sense, skill, specific, stimulation, structure, suggestion, thinking, thought, trust, values, world
processes	9	386	1.83	activity, adaptation, affect, assessment, assimilation, awareness, capture, change, consequence, culture, developing, development, devolution, education, emanate, emanating, eroding, erosion, execution, feeling, influence, isolation, issue, judging, knowledge, learning, litigation, loss, movement, notice, operational, outcome, performance, planning, preparation, process, processes, processing, progress, progressing, provision, reaction, reasoning, recognition, regard, regulation, response, rise, specialisation, stimulation, succession, suggestion, thinking, thought, touch, transfer, turn, use
practices	9	362	2.31	activity, annoyance, committing, cooperation, engage, execution, experts, good, implementation, knowledge, learn, much, operational, pattern, patterns, possible, practical, practicalities, practicality, practically, practice, practiced, practices, practicing, practicing, preparation, skill, skilled, skills, training, use, used, utilisation

(Source; Compiled by Author)

5.5 Process Coding, Frontline Policing Staff; Findings

Research Objective 1

A word count query conducted on the top gerunds (with triggers, consequences, and reactions) (Bernard, Wutich and Ryan, 2016) indicates that knowledge processes and practices account for the vast majority of the issues raised. While this simple word count does not indicate anything extraordinary in itself, it does illustrate the predilection for structure and process, with (as would also be expected, a combination of ability, assessment, co-operation, learning and progress all mentioned). Concerning research objective 1, the following issues are evident;

1. It appears that the majority of the issues cited by frontline police officers center around knowledge loss; for example, the data cites recruitment gaps and issues of credibility amongst the salient reasons for knowledge loss (Table 20, Lines 1 + 5), knowledge sharing for example, with more communication and training being advocated (Table 20, Lines 10 + 11), and knowledge practices, with for example, it not being classified, ad hoc, and not encouraged (Table 20, Lines 1, 4, and 11). Whilst there are knowledge practices in the organisation, these appear to be isolated and not organisation-wide (Table 20, Line 4). This may point to a lack of coordinated knowledge efforts, and if it is not captured, it will be lost (Seba, Rowley and Delbridge, 2012). However, further analysis will be conducted.

2. The phenomenon of siloism is evident in the organisation as pockets of knowledge practice have appeared in various sections, for example, in front line sections where knowledge appears to be inaccessible, and legislation can be difficult to interpret (Table 20, Lines 4+6).

3. There appears to be a lack of knowledge practice which does not emanate potentially from coherent knowledge awareness but incoherent knowledge application. This may have some bearing on what frontline police officers allude to as "disparate practices," "knowledge misinterpretation," and "accessing knowledge," for example, uncertainty in relation to central versus local administration of knowledge and knowledge practice and availability (Table 20, Lines 2, 4+6). It is clear from the literature that police officers need access to a myriad of information , and this has to be clarified in order to maximse knowledge potential (Gottschalk, 2006a).

4. One of the issues also highlighted concerning current practice is the issue of reliance on knowledge. Frontline managers allude to "deploying resources based on best practice", and "supporting information initiatives" (Table 20, Lines 7, 4+6), but these initiatives do not appear to be, as mentioned, standardised, because of issues mentioned such as "knowledge misuse and misinterpretation," for example, the reliance on knowledge can be an ally if used to interpret legislation, however, the data suggests that interpretation is not allowed for in current policy and regulatory practice (Table 20, Line 2).

Research Objective 2

With regard to process coding, and moving on to research objective two, the data indicates the following from a frontline policing perspective;

1. There are knowledge practices in the organisation, (this would refer specifically to overt practices regarding explicit instruction, training, legislative interpretation, and policing procedure), and are referred to as "policy enactment" (Table 20, line 6 + 9). These policies are detailed in two distinct manuals entitled The Garda Síochána Guide, which refers specifically to legal and constitutional interpretation and implementation, and the Garda Síochána Code (which refers to policing practice, policy, and procedure).

   However, the data suggests that these guidelines do not necessarily ensure knowledge availability or its effective use, with, for example, the most senior officer in the capital city cited the "recognition of knowledge" coupled with "effective strategising" as issues for the organisation (Table 20, line 2). The structural formation of policing practice can lend itself to both current and emergent strategy, however, it needs to be based around effective knowledge paradigms (Brown and Brudney, 2003). Frontline police officers have indicated that knowledge is not reconciled with practice, which points to a potential gap between knowledge policy and implementation; for example, the data indicates that the organisation does not always utilise knowledge as a resource, and consequently, it leave the organisation when people retire or resign (Table20, Line 4).

2. This section of the data analysis (RO1) has correlation with the literature on KM, with, for example, front line police officers suggesting that knowledge needs to be "combined" with experience in order to deliver proper knowledge evaluation and assist in bringing investigative processes to a successful conclusion (Table 20, line 5). It is noteworthy that this reflects one of the four pillars of the SECI model from Nonaka (Nonaka, 1991). Gottschalk et al. refers to a knowledge "exchange" process in policing whereby it is (in the case of detectives investigating a case, for example) "concerned with the exchange of knowledge within the investigation unit as well as other agencies and organisations" (Glomseth, Gottschalk and Solli-Sæther, 2007).

   This is echoed in frontline police personnel espousing the relevance of " quantifying local knowledge," and "overcoming issues through knowledge practice," both of which require real-world policing experience in order to be effective (Table 20 lines 8+11), (Roberts, 2015).

3. There is awareness amongst frontline police officers that knowledge plays a role in decision making (Table 20 Line 3); however, the ethos of policing is about dealing with incidents as they occur, and in a study conducted by Lindsay et al. concerning the impact of mobile technology on UK police force, for example, it was found that "most officers reacted positively to being able to stay out of the station and attend more incidents (Lindsay, Cooke and Jackson, 2009). This is echoed in the data to some extent as junior managers alluded to the "overuse of statistics" and the effective "resourcing of knowledge practices" which can keep front line police officers away from the streets. For example, statistics are being used for crime analysis, and these are being used in order to generate analyses for further statistical frameworks. This has the effect of increasing the amount of paperwork that front line police

officers and supervisors have to deal with (Table 20 Lines 7+9). This may have some reflection in the amount of oversight that is in effect in An Garda Síochána and the need for it to be justified.

4. It appears from a frontline policing perspective that knowledge is recognised as a key component of strategy, resource allocation, decision support, policy enactment, recruitment, and effective communication (Seba, Rowley and Delbridge, 2012), (Table 20, lines 3 +7 +10). However, it is also apparent that knowledge is somewhat "siloed" from the front-line policing perspective with localised knowledge, self-regulation, and informal knowledge gathering practices in evidence, for example, self styled knowledge templates that are used in legal proceedings (Table 20, lines 4, 8+10). Ultimately this may point to a lack of knowledge "embedding "in the organisation.

Research Objective 3

In relation to research objective three, process coding from frontline police officers illustrates the following;

1. Frontline police officers have commented on, as mentioned, the practicalities and relevance of knowledge and have also cited issues such as "more knowledge awareness," "delivery of knowledge initiatives," "supporting knowledge practices," and "the proper oversight of knowledge initiatives" for example, there is an awareness in the data that knowledge initiatives in the organisation will not come to fruition if the resources are not made available to support them (Table 20, lines 2 +3).

2. Frontline police officers have also cited issues that appear to be a direct result of a lack of embedded knowledge processes, for example, personalising knowledge has been mentioned (Table 18, line 6), as has the formalisation of specific roles (Table 20, line7). Examples include a sense of making knowledge personal by having to find relevant knowledge and seek counsel around legislation on an individual basis. Siloism is mentioned, alongside the suggestion from some frontline police officers that the recognition of this individualism should be promoted and championed (Table 20, lines 5+8). Denner and Blackman have alluded to this phenomenon as a reflection of public sector complexity, as it emanates from complex mandates and disparate jurisdictions, such as local government, education, and health (Denner and Blackman, 2013).

3. This is also reflective of the complex mandate of policing, as even within its environs it has exceptionally disparate remits, with Gottschalk et.al alluding to the complexity of detectives investing complex criminal cases (Dean, Fahsing and Gottschalk, 2006) and Seba and Rowley suggesting that police officers need to be "knowledge workers" due to the "knowledge-intensive" environment they work in (Seba, Rowley and Delbridge, 2012). Policing demands specialist skills in areas as diverse as cartography, profiling, specialised driving, youth diversity, social work, and family law, and it is perhaps naive to suggest that as knowledge workers, they could be expected to attain a level of knowledge competency in all of these areas.

4. The data reflects this insofar as frontline police officers appear to be dissatisfied with what they see as a lack of knowledge awareness and disparate practices that are in evidence in the organisation at present, with, for example, a lack of training on current legislation being cited as a key cause for concern (Table 20, line 2,1 +4).

5.6 Process Coding; Management, Support, and Political Oversight

Moving from frontline policing to Senior Gardaí, Garda Staff, and a senior member of the Public Accountability Commission, this section of the process coding looks at the data obtained from a mix of staff that are termed "non–sworn" members, i.e., those that have not undertaken formal policing training, those that are in senior positions in the organisation, and those charged with taking it to account. The commonality in this section is that none of these respondents operate at the front line of policing. However, quite a few are involved in policy and decision making and operate closely with front line officers and managers as regards organisational policy and direction.

The results of a word count query on the top gerunds (with triggers, consequences, and reactions), (Bernard, Wutich and Ryan, 2016) indicate processes, knowledge, and practices account for the three highest returns on a simple word count query return. This is reflective of the overarching issues elicited from the process coding. This also reflects an awareness of the importance of knowledge and its intrinsic links with policy, practice, and process concerning policing.

Delineating the respondents into frontline police officers and non-frontline police officers and staff has allowed the data to be analysed (from a process coding perspective) into these distinct areas;

1. **Frontline police officers**

2. **Non-frontline police officers**

3. **Civilian support staff**

4. **Civilian executive managers**

5. **Policing executive managers**

6. **Political Accountability**

In the context of the research question and objectives, the issues highlighted from front line police officers have been documented vis a vis process coding. However, in this second area, the views of the five other subgroups have been documented using the same process, and responses will be grouped accordingly.

The following tables are presented to illustrate the breakdown of the respondents and to explicate the process of process coding and gerund generation.

Table 22 Non-Frontline staff

Person	Civilian	Frontline	Garda	Gender	Manager	Position
Political	Yes	N/A	No	Female	No	Head of Political Accounts Committee
Civilian Staff	Yes	No	No	Female	No	Press Officer
Civilian Staff	Yes	No	No	Female	Junior	Finance Supervisor
Ex Director	Yes	No	No	Male	Senior	Head of HR
Ex Director	Yes	No	No	Male	Senior	Head of Forensics
Gda Manager	No	No	Yes	Male	Senior	Head of the Organisation
Gda Manager	No	No	Yes	Male	Senior	Deputy Head of the Organisation
Ex Director	Yes	No	No	Male	Senior	Head of Strategic Transformation
Ex Director	Yes	No	No	Male	Senior	Head of Garda Analysis Service
Ex Director	Yes	No	No	Male	Senior	Chief Administrative Officer
Ex Director	Yes	No	No	Male	Senior	Head of Finance
Gda Manager	No	No	Yes	Male	Middle	Junior Manager. Telecoms Section (Inspector)
Gda Manager	No	No	Yes	Male	Middle	Superintendent. In Charge of Training
Gda Manager	No	No	Yes	Male	Middle	Superintendent. In Charge of IT
Gda Manager	No	No	Yes	Male	Middle	Superintendent. Garda HQ

(Source; Compiled by Author)

Table 23 Process Coding; Non-Frontline Staff

	Person	Civilian	Frontline	Garda	Gender	Manager	RQ1 KM Practices	RQ2 KM Evaluation	RQ 3 KM Recommendations
1	Political	Yes	No	No	Female	TD	Accountability. Delivering value. Governing. Resourcing. Losing knowledge.	Mentoring. Monitoring.	Capturing knowledge. Focusing. Effective functioning.
2	Civilian Staff	Yes	No	No	Female	No	Knowledge networking. Dissemination. Securing knowledge	Effective transfer of information. Security protocols. Formalising knowledge practices	Effective broadcasting. Structuring knowledge processes. Formalising information
3	Civilian Staff	Yes	No	No	Female	Junior	Supporting the organisation. Centralising. Merging. Changing work practices	Role delineation. Provisioning resources. Knowledge transfer	Training. Timing. Staff turnover. Accepting change. Civilian / Police
4	Ex Director	Yes	No	No	Male	Senior	Knowledge loss through staff retirement. Knowledge Resourcing. Scheduling.	An entitlement to knowledge.	Acknowledging weaknesses. Demonstrable ability. Personnel Deployment.
5	Ex Director	Yes	No	No	Male	Senior	Knowledge assessment practices. Standardising knowledge practices. Knowledge loss	Protecting data. Securing information. Documenting knowledge	Integrating knowledge and knowledge practice. Maintaining competency
6	Gda Manager	Yes	No	No	Male	Senior	Assisting practice. Problem-solving, Supporting infrastructure. Organising resources. Knowledge loss	Enabling practices and procedures. Interpreting legislation. Training. Recruitment	Awareness of knowledge gaps. Elucidating the differences between training and education. Policing as a service.
7	Gda Manager	Yes	No	No	Male	Senior	Combining knowledge practices.	Structuring knowledge. Measuring crime. Re-enforcing hierarchy with trust Scaling real knowledge value	Utilising knowledge to affect reputation. Symbiotic relationship building. Succession planning. Measuring individual knowledge.
8	Ex Director	Yes	No	No	Male	Senior	Networking. Mandating. Transmitting information. Implementing legislation	Documenting knowledge. Accumulating knowledge. Hiring practices. Strategising	Mandate clarification. Capturing knowledge. Focusing on historical practice.

	Person	Civilian	Frontline	Garda	Gender	Manager	RQ1 KM Practices	RQ2 KM Evaluation	RQ 3 KM Recommendations
9	Ex Director	Ex DIrector	No	No	Male	Senior	Knowledge awareness. Resourcing knowledge.	Service provision. Knowledge and data prioritisation.	Unifying an approach to knowledge. Utilising technology and culture
10	Ex Director	Ex Director	No	No	Male	Senior	Knowledge hoarding. Relying on knowledge	Knowledge sharing. Providing the right knowledge at the right time (training)	Actioning siloed knowledge. Utilising experiential knowledge
11	Ex Director	Yes	No	No	Male	Senior	Resource allocation. Training and education. Managing resources. Knowledge initiatives. Tacit knowledge generation. Knowledge loss.	Practical budgeting. Effective resource allocation. Education. Data Protection.	Capture tacit knowledge. Budgetary planning. Capitalising on individual knowledge. Oversight.
12	Gda Manager	Yes	No	No	Male	Junior	Education / Training. Security.	Knowledge Resourcing. Implementing security paradigms. Knowledge hoarding. Knowledge dissemination.	Standardising knowledge. Encouraging tacit knowledge. Governance.
13	Gda Manager	Yes	No	No	Male	Middle	Business knowledge. Knowledge presentation.	Knowledge transfer. Succession planning.	To address discretion. Cultural knowledge. Credibility. Publicising knowledge
14	Gda Manager	Yes	No	No	Male	Middle	Training. Standardising. Resourcing. Creating environments	Interaction. Learning. Educating. Standardising operating agreements.	Conflating knowledge practice. Knowledge handover. Training (Shadowing). Resourcing.
15	Gda Manager	Yes	No	No	Male	Middle	Complimenting Service Provision.	Resourcing. Sharing knowledge. Effective communication.	Training. Dealing with situations. Interrogation. Willingness to share. Networking. Innovating. Oversight. Observation.

(Source; Compiled by Author)

Table 24 Key Word Returns. Leadership and Management Staff

Word	Length	Count	Weighted Percentage (%)	Similar Words
processes	9	535	2.84	accumulation, actioning, assessment, association, awareness, career, challenge, culture, deciding, deliver, detection, developing, development, education, feeling, fixing, foresight, identification, impact, judgment, knowing, knowledge, learning, operating, operational, perception, planning, procedural, procedurally, procedure, procedures, process, processes, processing, progress, progression, reaction, recognition, response, rise, rule, serve, serving, suggestion, tool, train, transfer, transform, treating, understanding, work, working
knowledge	9	523	2.03	ability, acceptance, capability, capacity, concept, culture, deciding, defensive, difficulty, direction, domain, education, experience, familiarity, feeling, foundation, ignorance, individualism, influence, information, initiative, initiatives, innovation, intelligence, interpretation, justification, knowing, knowledge, knowledge, leadership, learning, level, life, matter, mentality, mindset, organisation, overlap, perception, perspective, place, practice, problem, process, reaction, recognition, representation, respect, retention, rule, science, sense, skill, specific, structure, subject, suggestion, system, tolerance, understanding, values, view, world
practices	9	421	2.40	annoyance, committing, employment, experts, exploitation, good, implementation, knowledge, operating, operational, possible, practical, practicality, practice, practices, realistic, rule, skill, skills, training, use, utilisation, working

(Source; Compiled by Author)

5.7 Process Coding; Management, Support, and Political Oversight; Findings

Research Objective 1

1. Examining the data from the first group of "non-frontline police officers" (table 23), indicates that knowledge is mentioned from multiple standpoints, noticeably education and training, knowledge presentation and security, (Table 23, lines 12 + 14). This correlates with front-line police officer's data, however; it does not suggest that the training or education processes are adequate or conflated, and this is illustrated by issues highlighted, such as standardising training and education, complimenting knowledge processes through effective environments, and complimenting service provision. These can be underpinned by relevant and focused knowledge solutions (Al-Rahmi *et al.*, 2019). For example, the data suggests that the differences between education and training lie in the difference between the two, with relevant and requisite education cited as required in order to fully implement training paradigms (Table 23, lines 6, 14 + 15).

2. From the perspective of civilian support staff, issues highlighted include knowledge networking, supporting the organisation, and merging/centralising work practices (Table 23, lines 2 +3). This echoes somewhat the organisations strategic imperative in their "modernisation and renewal program" which includes centralising functions such as finance, human resources, and pension/allowances. This is also part of the Irish Government plan to centralise all public sector functions and is in line with the drive for greater accountability and transparency across the public sector.

3. Concerning research question 1, civilian executive managers have cited issues that correlate with their Garda counterparts, including knowledge loss, training and education, and resource allocation. Knowledge hoarding has also been cited, as has a reliance on knowledge. It is also noteworthy that tacit knowledge is mentioned, which is crucial in any investigation, (Dean, Fahsing and Gottschalk, 2006), as is legislative implementation and the mandating of knowledge. The data shows (as expected), complexity and uncertainty around mandates as it is necessary for example, in order to have structure, but this can mitigate innovative and discretionary practice if adhered to too vigorously (Table 23, lines 4, 8, 10 +11).

4. Policing executive managers have highlighted issues such as problem-solving, infrastructure support, and utilising knowledge for problem-solving and organising resources; for example, changing the style of uniform involves complex structural change around processes, procedures, procurement, and government guidelines (Table 23, line 6).

5. Not surprisingly, the government representative stressed the value of accountability, governing and resourcing, along with delivering value (Table 23, line 1).

Research Objective 2

1. The first group of non-frontline police officers cited knowledge as being relevant in succession planning, learning, and in standardising operating agreements between the police and outside agencies (Table 23, lines 13 +14). Issues such as knowledge sharing were highlighted, as was security and effective communication; for example, the security of information, the security of the state, and the security of persons in

custody are all emotive and require different knowledge capabilities (Table 23, lines 12+15). The sharing of knowledge both nationally and internationally is fundamental to successful policing, and this is clearly echoed in the literature (Griffiths *et al.*, 2016), and its correlation with effective communication also clearly indicated in the data.

2. Concerning civilian support staff, issues such as knowledge utilisation for the effective transfer of information, formalising practices, and resource provisioning are highlighted, with, for example, the resources for knowledge transfer (shadowing), not being readily available. (Table 23, lines 2 + 3).

3. Civilian executive managers highlighted issues such as the effectiveness of knowledge in hiring practices, strategising, service provision and training (to disseminate accurate knowledge), resource allocation, and data protection issues, which are currently being interpreted for implementation under GDPR legislation. (Table 23, lines 4 +5, 8-11).

4. Policing executive managers also highlighted knowledge in terms of its value for interpreting legislation, training, reinforcing hierarchy, and scaling value, which forms part of the modernisation and renewal program which is currently being implemented (Table 23, lines 6+7).

5. Concerning political oversight, the effectiveness of knowledge has been highlighted in terms of monitoring and mentoring (Table 23, line 1). Given the historical grounding for political oversight in terms of its original mandate to remain mutually exclusive from policing (Reiner, 2010), politics have now however become intrinsically linked with policing, and this is also reflected in the current level of oversight and accountability at all levels of the organisation. This, for example has been highlighted at all levels in the data corpus, which collectively suggest that the amount of governance is onerous and mitigates discretion and innovation.

Research Objective 3

1. Concerning Research Objective three, the process coding suggests that from the perspective of non-front-line police officers, the following issues are relevant to potential improvements in knowledge practices. Discretion is an issue that could be addressed, along with culture and cultural change. Publicising knowledge is also mentioned as a possible issue with a lack of coherent strategy around knowledge implementation. For example, the data suggests that discretion and the commensurate tacit knowledge that can flow from it, is almost nonexistent in policing, despite it being suggested in the literature as the foundation on which policing is built (Table 23, lines 12-15).

2. With regard to succession planning, conflating knowledge processes and practices and effective knowledge handover were mentioned in conjunction with training and resourcing. Shadowing was also cited as an effective way to address knowledge handover, as was a culture oriented towards a willingness to share knowledge. The levels of oversight were also highlighted. (Table 23, lines 12-15).

3. Concerning research objective three, civilian support staff cited formalising information as a process, and effective broadcasting of knowledge issues. Training was mentioned in terms of timing), as was the issue of staff turnover and the acceptance of change. (Table 23, lines 2 +3).

4. Civilian executive managers suggested that a mandate for clarification is required around knowledge process, as well as a unified approach to knowledge utilising technology as an enabler/facilitator. Maximising and capitalising on individual knowledge was also highlighted, for example, the awareness and dependency on individual knowledge, commensurate with what appears to be uncertainty as to how to best utilise it, as well as acknowledging weakness in the present systems. Integrating present knowledge practices with the potential of new ones to assist in budgeting and budgetary practices was also highlighted. (Table 23, lines 4, 5 + 8 -11). Cost effectiveness in policing is a very topical issue with most police forces evaluating service delivery versus resource allocation and scalability (Exchange and Report, 2018)

5. Policing executive managers cited the utilisation of knowledge to bolster reputation, alongside relationship building and succession planning. The issue of highlighting the differences between training and education was also mentioned. (Table 23, lines 6-7).

6. Concerning political oversight, capturing knowledge was mentioned, as was focusing on knowledge gains, and a call for more effective functioning of complex systems was cited. (Table 23, line 1).

5.8 Process Coding Summary

Delineating the process coding into two specific groups has allowed for a unique perspective to be taken from both frontline policing in one area and support, management, and oversight viewpoints on the other.

The data analysed from the process coding cycle illustrates correlation with the literature in several ways. For example, from a frontline policing perspective, knowledge loss, complexity, practice, and efforts to retain knowledge (once articulated) have been documented by Jain, Boateng, and Choo, and Bontis. However, knowledge loss is linked with knowledge transfer and knowledge hoarding, and in police work, the complexity of knowledge practices can make this difficult. This is also linked to the phenomenon of knowledge sharing, which can be difficult if employees perceive knowledge as intrinsically linked to power or prowess (Seba and Rowley, 2010).

Knowledge practices in policing have also been documented; however, they appear to be isolated and somewhat disparate, as the data suggests there is a lack of co-ordination in the context of knowledge practices, and they are somewhat confined to individual knowledge holders or sections (pockets) of expert knowledge.

Individual knowledge gathering or "siloism" is mentioned from a front line policing perspective. The data has suggested that individuals have become specific knowledge champions or brokers in specified sections as a result of necessity rather than design. This is an interesting phenomenon, and not one immediately apparent in the literature. It is almost the opposite to what one expect, as Gottschalk, for example, suggests that "as a knowledge worker, the detective needs to work closely with other knowledge workers in the organisation by sharing knowledge (Gottschalk, Holgersson and Karlsen, 2009), Rowley et al. suggests

that "the practices and applications of knowledge sharing should be adapted to suit specific organisational situations (Seba, Rowley and Delbridge, 2012).

This suggests that knowledge could and should be shared; however, it appears to be the opposite phenomenon at play, with what seems to be a lack of knowledge sharing fostering the requirement for individual knowledge holders to rise because of a lack (perceived or otherwise) of knowledge availability in the organisation. This is not to suggest that knowledge hoarding does not occur; rather, with Cong et.al, and Delaney and Donnell, citing it as one of the key challenges to knowledge management in the public sector (Cong and Pandya, 2003b; Delany and Donnell, 2005).

In relation to knowledge practices, the data suggests that there appears to be a lack of coherency around them. Rather, there may be individual or disparate section wide organisational knowledge practices that are either not disseminated specifically to all areas or utilised effectively for those that may need access to specific knowledge.

The specific or overt practices that are applied in the organisation appear to be applied in a hierarchical, public sector manner that allows the flourishing of hierarchical structures and constructs. For example, as mentioned, the Garda "code" and "guide" delineate instruction to frontline members apparently without the benefit of input from the frontline members themselves. This is born out in the data by the suggestion that knowledge is not "reconciled" with practice, and there is a potential gap between process and implementation.

In order to bring knowledge to the fore in the organisation it has been suggested in the data that it is combined with practice and technology. This has been discussed in a policing context in the literature with, for example, Gottschalk suggesting that combining technology with data from various sources may provide a more coherent investigative picture of crime analytics (Glomseth, Gottschalk and Solli-Sæther, 2007).

The data also suggests that there is an issue with oversight insofar as it pertains to uncertainty, impracticality, and somewhat diverges from what it appears to have set out to do. For example, the police oversight body entitled the Garda Inspectorate has set as its purpose to "ensure that the resources available to An Garda Síochána are used efficiently and effectively" (Garda Inspectorate website. www.gninsp.ie). The Garda Ombudsman's purpose is to "deal with matters involving possible misconduct by members of An Garda Síochána, in an efficient and fair manner", (Garda Ombudsman website www.gardaombudsman.ie). The Irish policing authority's mission statement is to "drive excellent policing through valued and effective oversight and governance" (Irish Policing Authority website).

The data also indicates that from a frontline policing perspective, knowledge effectiveness and efficiency are not to the fore at present. For example, "fire fighting," "reacting," "soloing," and "effective deployment of resources," have all been mentioned as issues that face An Garda Síochána at present.

Frontline police officers have also suggested that knowledge needs to be inculcated at the front line and relevant in terms of "local knowledge," and knowledge needs to be standardised and used to overcome issues of complexity. There is also awareness that knowledge is essential for decision-making.

It appears that siloism has emerged principally from frontline policing members taking steps in order to maximise their local knowledge and induce self-regulation in order to protect themselves.

Leadership and Management Staff

The results from the second group of respondents indicate knowledge is complex, multifaceted, and at various states of maturity throughout the organisation. In conjunction with frontline police officers, knowledge is mentioned in relation to training and education, supporting the organisation and centralising and organising work practices.

The civilian staff highlighted issues such as knowledge networking and greater accountability and transparency. Issues of possible shortcomings have also been cited between the civilian and policing staff; however these issues possibly stem from a lack of coherent responsibilities and role delineation.

Civilian executive managers suggested that effective resource allocation, knowledge hoarding, and the enhancement or encouragement of tacit knowledge generation are also issues that can affect and are affecting An Garda Síochána. Policing executive managers (including the Police Commissioner and the Deputy Police Commissioner) highlighted the potential of effective knowledge utilisation to support infrastructure, and assist in problem-solving and more effective resource allocation.

This group also suggested that knowledge could be useful in relation to succession planning and standardising both external and internal agreements between parties and outside agencies. Knowledge was also mentioned in terms of its propensity to scale value, and more closely disseminate issues around data protection affect cultural change.

The literature is clear in relation to police knowledge management in that it suggests it is complex (Dean, Fahsing and Gottschalk, 2006). It needs to be effective (Seba and Rowley, 2010), and it needs to value both society and its own personnel in terms of effective training and education (Dean, Fahsing and Gottschalk, 2006; Caparini and Osland, 2017). However,

the view from inside the workings of a modern police service appears to corroborate this to a certain degree with executive managers calling for knowledge to be maximised and capitalised on as disparate practices are emerging because of a lack, or perceived lack, of knowledge consistency.

The next stage of the process is to develop these gerunds and look at the process through the lens of "in-vivo" coding.

5.9 In Vivo-Coding

Before the commencement of the in-vivo coding phase, the following table is presented in order to show the breakdown of the individual interviews / interview transcript by interview number, respondent, and role. The interview transcripts are contained in a separate volume and are presented for reference only due to the sensitive nature of the content.

Table 25 Interview Respondents

Interview Number	Respondent	Role
1	CCN	Government Oversight
2	LW	Civilian Support Staff
3	JG	Civilian Support Staff
4	AM	Civilian Executive Manager
5	CE	Civilian Executive Manager
6	DG	Civilian Executive Manager
7	GS	Civilian Executive Manager
8	JN	Civilian Executive Manager
9	MC	Civilian Executive Manager
10	PM	Non-Frontline Police Officer
11	POD	Non-Frontline Police Officer
12	PR	Non-Frontline Police Officer
13	JK	Non-Frontline Police Officer
14	COCUL	Police Executive Manager
15	JT	Police Executive Manager
16	AC	Frontline Police Officer (Junior)
17	ACL	Frontline Police Officer (Senior Mgt)
18	BMCP	Frontline Police Officer (Senior Mgt)
19	BS	Frontline Police Officer (Middle Mgt)
20	CH	Frontline Police Officer (Junior Mgt)
21	CJN	Frontline Police Officer (Senior Mgt)
22	CM	Frontline Police Officer (Middle Mgt)
23	DB	Frontline Police Officer (Junior Mgt)
24	DMMC	Frontline Police Officer (Middle Mgt)
25	JMCD	Frontline Police Officer (Junior Mgt)
26	SK	Frontline Police Officer (Middle Mgt)

In order to answer the research objectives in the context of the data collected, this level of coding will build on the gerunds in order to bring more context and specificity to the data.

As discussed in chapter four, In vivo coding has been described as a coding method which extrapolates meaning from text or nuanced detail from particular meanings or intonations (Strauss, 1987).

In this section of the analysis, the gerunds from the two cohorts will be conflated for ease of reference. The data examined and analysed will have two referential components, the first is the cohort (cohort 1 will be front line police officers, and the second, cohort 2, which will consist of Civilian Support Staff, Civilian Executive Managers, Policing Executive Managers, Non-Frontline Police officers, and the respondent representing Governmental Oversight). The second is the research objectives, against which the data will be detailed and referenced. The codes will be presented against each gerund, and the data referring to the codes (with the exception of some pertinent examples) will be presented in appendix volume two. (Please note this volume will only be available on request, as it contains potentially sensitive information).

Figure 22 Research Objective 1 Gerund Results

Knowledge	Practices	Information	Technology	Resources	Training / Education	Miscellaneous
Losing knowledge	Disparate practices	Communicating	The utilisation of technology	Policing by consent	Training	Reducing paperwork
Accessing knowledge	Personal networking	Transferring information		Deploying resources based on best practice		Unwillingness to change
Restricting knowledge practices	Co-ordinating	Supporting information initiatives		Resource deployment	Co-ordinating	Supporting information initiatives
Relying on knowledge	replicating processes	Networking		Organising resources	Standardising	
Lacking knowledge	Questioning Existing Practices	Transmitting information		Complimenting service provision	Creating environments	Legislation
Formalising knowledge	Mentoring and Monitoring					Security
Condensing knowledge	Delivering value					
Transferring knowledge	Governing.					
Accrediting and standardising knowledge	Supporting the Organisation					
Capturing knowledge	Centralising					
Knowledge sharing	Merging					
Knowledge misuse and misinterpretation	Problem solving					
Assessing knowledge						
Knowledge Networking						
Combing knowledge practices						
Knowledge awareness						
Knowledge hoarding						
Tacit knowledge generation						
Business knowledge						

5.10 In-Vivo Coding Examples

> The following sections contain examples of the codes generated from the data and relating to each of the gerunds generated from process coding. Due to the volume of data and code generation, these have been confined (in the main) to volume 2 (appendix coding for in-vivo).

Knowledge Loss (Appendix V2; A.1)

Leads to lack of credibility (ACL, Interview 17).

It leads to difficulties for management (BMCP, Interview 18).

Example

Until the organisation harvests its knowledge and begins to publish it, it will continue to be compromised from an international perspective in terms of credibility.

Accessing Knowledge (Appendix V2; A.2)

Is it effective to have access to knowledge for all? (CE Interview 5).

Restricting knowledge practices (Appendix V2; A.3)

Restricting knowledge practices is synonymous with trust (CJN Interview 21).

Relying on knowledge (Appendix V2; A.4)

We rely on the people who have knowledge and we know that the tacit element to it is difficult to encapsulate (DG Interview 6).

Example

The organisation does not encapsulate the knowledge that the knowledge silos have gathered, insofar as individual knowledge experts are currently not recognised in any official capacity

Lacking knowledge (Appendix V2; A5)

> **A lack of knowledge can lead to an increase in uncertainty, and unclear role delineation. (DB Interview 23).**

Example

There is uncertainty in the organisation around ownership of knowledge insofar as the division is evident between central and local administration of procedure and policy

Formalising knowledge (Appendix V2; A.6)

> **Explicit knowledge is essential for a police officer as a foundation in order to foster more knowledge (SK Interview 26).**

Condensing knowledge (Appendix V2; A.7)

> **The value of tacit knowledge (SK Interview 26).**

Knowledge transfer and knowledge sharing (Appendix V2; A8, A8A)

> **Lack of efficient knowledge transfer policies can leave junior police officers with a lack of experience and no one to ask for help (CM Interview 22),(AC Interview 16).**

Example

There have been situations where arresting officers are unsure of the exact legislation needed to effect an arrest and only aware of the broad power of arrest. This has highlighted the requirement for front requisite line knowledge to be available at all times

Accrediting and Standardising Knowledge (Appendix V2; A.9)

Accreditation is key for knowledge initiatives (CJN Interview 21).

Capturing Knowledge (Appendix V2; A.23)

Professional Education playing a role in knowledge capture JK Interview 13).

We are utilising IT for knowledge capture, but historical records are not captured (POD Interview 11).

Knowledge Misuse and Misinterpretation (Appendix V2; A10)

Legislation and the knowledge that accrues from it is open to interpretation, and knowledge as a result, is ad-hoc (Cm Interview 22).

Assessing Knowledge (Appendix V2; A.11)

We don't have the resources to assess knowledge and hand it over (BMCP Interview 18).

Example

Shadowing has been mentioned in the data as desirable. However, the data also indicates that the resources to carry this out and increase the knowledge sharing capability of the organisation are not there at present.

Knowledge Assessment Practice (Appendix V2; A.12)

> ➤ **We do not have the equipment or support to even look at how we are performing (CM Interview 22).**

Knowledge Networking (Appendix V2; A.13)

Rules and regulations mitigate the effectiveness of networking (ACL Interview 17).

Combining Knowledge Practice A.14

Operational policing needs resource co-operation (DCT Interview 15).

Knowledge Awareness (Appendix V2; A.15)

There is not an organisational awareness of what sections are knowledgeable in what areas (PR Interview 12).

Example

There is a lack of consolidated knowledge awareness in the organisation which has led to the local knowledge of police officers not being fed back into the organisation, this is acknowledged in the data and is an issues all ranks are acutely aware of, however, there does not appear to be a collective will to address this.

Knowledge Hoarding (Appendix V2; A.16)

We need to capture knowledge to reduce knowledge hoarding (PM Interview 10).

Knowledge is power and that is why individuals guard it (MC Interview 9).

Tacit Knowledge Generation (Appendix V2; A.17)

Tacit knowledge assists in the smooth running of the organisation (MC Interview 9).

Business Knowledge (Appendix V2; A.18)

> This is an organisation that is good to do business with, and we have a propensity for
>
> talking and engaging (ACL Interview 17).

If we move to the Issue of "practices" (Table 14 refers), the following can be coded;

Disparate Practices (Appendix V2; A.19)

> Knowledge has value if the strands are brought together to form a cohesive entity (DG Interview 6).

Replicating (Appendix V2; A.20)

> Replication can be a boon to knowledge practice and practicality (BMCP Interview 13).

Existing Practice (Appendix V2; A.21)

> Knowledge practice builds up over time (SK Interview 26).

Example

The information portal in the organisation is utilised to inform practice, but the organisation wants it to become a knowledge portal. Utilising this research, it is envisaged that it will become part of the knowledge strategy going forward.

Mentoring and Monitoring (Appendix V2; A.22)

> Mentoring without process (ad hoc) is effective in inducting new people into the organisation (CM Interview 22).

Delivering Value (Appendix V2; A.24)

Knowledge is the organisation's value chain (POD Interview 11).

We need to analyse the quality of the data before we can derive value from it (GS Interview 7).

Example

Knowledge can deliver value in policing in terms of local (tacit) knowledge and investigative practice. It is recognised in the data as having the potential to do this, but it needs to be encouraged and nurtured.

Governance (Appendix V2; A.25)

Is there governance? (GS Interview 7).

It's hierarchical and complicated (BS Interview 19).

Supporting the Organisation (Appendix V2; A.26)

We cannot support the organisation without an appropriate level of investment (CE Interview 5).

Centralising (Appendix V2; A.27)

Centralising functions in a complex policing environment can be very difficult (JK Interview 13).

Problem Solving Appendix V2; A.28)

Problem solving is very difficult in a culturally complex environment

(CE Interview 5).

Example

The data suggests the complexity of the organisation mitigates problem-solving because the issues are presented as organisation wide, rather than proprietary. This means that information and procedures are disseminated to all rather than specific sections, and this can slow down the time-frame in terms of delivering solutions.

<u>Communicating (Appendix V2; A.29)</u>

> **Policing needs networking (JK Interview 13).**

> **Communication is about listening, not talking (AM Interview 4).**

<u>Transferring Information (please see "knowledge transfer" Appendix V2; A.8)</u>

<u>Supporting information initiatives (Appendix V2; A.30)</u>

> **We cannot utilise some communication initiatives in deference to potential tension (BMCP interview 18).**

<u>Networking (please see "knowledge networking" A .13)</u>

<u>Transmitting Information (please see knowledge sharing and transferring A.8)</u>

<u>The utilisation of technology (Appendix V2; A.31)</u>

> **We don't even have basic information management systems (DG Interview 6).**

> **We need to embrace new technology, and manage it (BS Interview 19)**

Example

Technology solutions are not tailored to individual sections, and the data suggests there are not specific reference points for the conflation of technology driven information. For example, at present, the main systems are not linked to the judicial systems and this can cause delays in processing (for example), penal information.

Policing by Consent (Appendix V2; A.32)

> **Law enforcement is not policing by consent (BS Interview 19).**

> **Policing by consent is a basic element of policing (COCUL Interview 14).**

Deployment of Resources / Organising Resources (Appendix V2; A.33)

> **Resource deployment is not clear and societal pressures may be a factor (DG Interview 6).**

> **We are not making as good a decision as we might be around resource deployment (AM Interview 4).**

Complimenting service provision (Appendix V2; A.34)

> **Knowledge being used to compliment service provision and experience from other police forces is key (DMMC Interview 24).**

Training (Appendix V2; A.35)

> **I have initialised my own "ad-hoc" training regime (SK Interview 26).**

Example

The response to a lack of knowledge availability can be clearly seen in this example. According to the data, this has occurred a number of times, born of necessity and lack of front line knowledge.

<u>Co-ordinating (see Centralising and Merging Appendix V2; A.27)</u>
<u>Standardising (see Accrediting and Standardising Knowledge Appendix V2; A.9)</u>

<u>Creating Environments (Appendix V2; A.36)</u>

    The present environment is one of caution and suspicion (ACL Interview 17).

<u>Restricting Paperwork (Appendix V2; A.37)</u>

    Training does not prepare you for the amount of paperwork that has to be done at the front line (CH Interview 20).

<u>Unwillingness to Change (Appendix V2; A.38)</u>

    You cannot change the job, so do not let it change you (CM Interview 22).

    We don't like change (AM Interview 4).

<u>Legislation (Appendix V2; A.39)</u>

    Legislation is complex and it is very difficult to apply in certain frontline situations, you need a knowledge base at your disposal (JK Interview 13).

Example

The legislative knowledge for effective front line policing is not available at the apex of policing, and this is a direct entreatment from the front line to a knowledge solution to make front line policing more effective .

<u>Security (Appendix V2; A.40)</u>

Security has a broad remit, which is reflected in the remit of An Garda Síochána (JK Interview 13).

We need good governance in order to ensure the security of data (JK Interview 13).

Figure 23 Research O2 Table

Knowledge	Practices	Information	Technology	Resources	Training / Education	Miscellaneous
An entitlement to Knowledge.	Interpreting legislation	Effective transfer of information.		Service provision	JIT training	Mentoring. Monitoring
Structuring knowledge	Re-enforcing hierarchy with trust	Securing information		Effective resource allocation	recruitment	Measuring crime.
Formalising knowledge	Hiring practices	Exchanging information		Role delineation	Learning	Communicating decision
Documenting knowledge	Strategising	Data protection		Recruitment		Interaction
Scaling knowledge value	Practical budgeting	Effective Communication				Recognition of seniority
Documenting knowledge	Data protection					
Accumulating knowledge	Implementing security paradigms					
Knowledge resourcing	Standardising operating agreements					
Recognising knowledge ability	Fire fighting					
Ranking knowledge assets.	Soloing					
Supporting knowledge decisions	Overuse of statistics					
Structuring knowledge	Policy enactment					
Reconciling knowledge practice.	Self-regulation					
Knowledge and experience.	Succession Planning					
Autonomising knowledge						
Classifying knowledge practice						
Knowledge dissemination						
Championing knowledge						
Knowledge adaptation						
An Entitlement to knowledge						
Knowledge and data prioritisation						
Informal knowledge gathering						
Knowledge evaluation						
Combining knowledge with experience						
Quantifying local knowledge						
Disseminating knowledge						
Knowledge adaptation						
Overcoming issues through knowledge practice						

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<u>Entitlement to Knowledge (Appendix V2; A.41)</u>

You are entitled to know what is necessary in order to do your job (AM Interview 4), (BS Interview 19).

<u>Structuring knowledge (Appendix V2; A.42)</u>

We do not have an effective knowledge support structure (SK Interview 26).

Example

The data suggests that knowledge needs to be supported and structured more in terms of effective communities of practice and intranets etc. At present, neither of these exist in the organisation.

<u>Documenting knowledge (Appendix V2; A.43)</u>

We need to begin to document our knowledge coherently and consistently (CE Interview 5), (BMCP Interview 18).

<u>Scaling knowledge (Appendix V2; A.44)</u>

We have no real understanding of the scale of our own organisation (DCT Interview 15).

Example

According to the data, the extent to which knowledge is necessary, for example, on an international scale, is not immediately apparent, with, for example, no local access to international databases or information portals.

<u>Accumulating knowledge (Appendix V2; A.45)</u>

Accumulated knowledge takes time, discipline and experience (CE Interview 5).

Knowledge Resourcing (Appendix V2; A.46)

We need resources we do not have (JMCD Interview 25).

Recognising Knowledge Ability (Appendix V2; A.47)

Knowledge ability needs to be recognized in order for succession planning to occur (CJN Interview 21).

Ranking Knowledge Assets (Appendix V2; A.48)

Higher ranks should be more highly educated (POD Interview 11).

Supporting Knowledge Decisions (Appendix V2; A.49)

People in key positions that provide supports are not themselves being supported and their knowledge harvested (PR Interview 12).

Reconciling Knowledge Practice (Appendix V2; A.50)

Arrest first if you think you should, then reconcile that with legislation later (DB Interview 23).

Knowledge and Experience (Appendix V2; A.51)

It is difficult to replace knowledge holders (CH Interview 20).

Example

Knowledge loss is a key factor in the organisation, due to the recent moratorium on recruitment and the policies around transferring on promotion.

Autonomising Knowledge (Appendix V2; A.52)

We are in danger of losing our innovation and discretion (MC Interview 9).

Classifying Knowledge Practice (Appendix V2; A.53)

We need to be able to classify our practices (CJN Interview 21).

Knowledge Dissemination (Appendix V2; A.54)

We need to be quicker disseminating knowledge (DB Interview 23).

Championing Knowledge (Appendix V2; A.55)

Knowledge champions have arisen because of a need, a desire, or recognition of lack of support (CM Interview 22).

Knowledge Adaptation (Appendix V2; A.56)

We have to be able to adapt to all of these changes, societal demands, technology, and technologically enabled crime (JK Interview 13), (MC Interview 9).

Example

The data clearly illustrates the complexity of policing mandate. However, policing needs to adapt to a myriad of situations, such as the current pandemic, where the majority of officers (regardless of location), have been redeployed to checkpoint/traffic duties.

Knowledge and Data Prioritisation (Appendix V2; A.57)

Knowledge, data, and policy are all very important and they are not being protected properly (PR Interview 12).

Informal Knowledge Gathering (Appendix V2; A.58)

Informal knowledge depends on successful networking (MC Interview 9).

Knowledge Evaluation (Appendix V2; A.59)

We learn as we go and then offer it up for scrutiny (ACL Interview 17).

Combining Knowledge with Experience (Please see Knowledge and Experience (Please see Appendix A51)

Quantifying Local Knowledge (Appendix V2; A.60)

I see local knowledge as critical to success (POD Interview 11).

Disseminating Knowledge (Please see Knowledge Dissemination Appendix A.54).

Overcoming issues through Knowledge Practice, Please see;

Reconciling Knowledge Practice; Appendix A.50

Classifying Knowledge Practice; Appendix A.50

Combining Knowledge Practice; Appendix A.14

Restricting Knowledge Practice; Appendix A.3

Knowledge assessment Practice; Appendix A.12

Interpreting Legislation; Appendix A.39

Re-enforcing hierarchy with trust (Appendix V2; A.61)

Trust in the rank structure to do their job is paramount (POD Interview11).

Example

The data indicates that officers who have served at the front line are more trusted and accepted than those who have not; this is because, empathetically, they are regarded as having been at the forefront of policing, interacting with the public.

Hiring Practices (Appendix V2; A.62)

It is hard to hire the proper people give policing complex mandate (CM Interview 22).

Strategising (Appendix V2; A.63)

Strategy will only be as good as the knowledge you have (Am Interview 4).

Practical Budgeting (Appendix V2; A.64)

Budgeting stifles innovation and opportunity (MC Interview 9).

Example

The data suggests that crime is potentially going to be costed in terms of cost-benefit, and this may have the potential to reduce or erode public confidence in policing and commensurately reduce local contact and thus the potential for tacit knowledge to be generated

Data Protection (Appendix V2; A.65)

We need to be able to protect people and we need to access data to do it (DG Interview 6).

Implementing Security Paradigms (Appendix V2; A.66)

Security is what we do (COCUL Interview 14).

Standardising Operating Agreements (Appendix V2; A.67)

Documenting everything is key (PR Interview 12).

Firefighting (Appendix V2; A.68)

Culture needs to change and be proactive instead of reactive (BS Interview 18).

Example

The data has illustrated practices that are born of reactive policy rather than proactive, for example, the proliferation of governance bodies; some initiated as a reaction to public outcry rather than detailed research as to their potential to add value.

Soloing (Appendix V2; A.69)

You are on your own if something goes wrong (JMCD Interview 25).

Overuse of Statistics (Appendix V2; A.70)

Overuse of statistics is causing issues for front line police officers (DMMC Interview 24).

Policy Enactment (Appendix V2; A.71)

The organisation needs to have policies in place to protect data and knowledge (PR Interview 12).

Self –Regulation (Appendix V2; A.72)

You have to be disciplined to keep yourself up to date on legislation (JMCD Interview 25).

Example

The data illustrates this disparity; for example, the training ethos appears to be one of coherence, insofar as it is suggested to be adequate for the provision of knowledge. However, the view from the front line is that it is up to the individual to keep themselves

trained and up to date. This would indicate knowledge discrepancy in an area where it is vital.

Succession Planning (Appendix V2; A.73)

> We need to identify knowledge holders & it would be invaluable and look at a form of succession planning (DCT Interview 15).

Effective Transfer of Information (Please see Knowledge Transfer Appendix A.8)

Securing Information (Appendix V2; A.74)

> We are confident in the security of our information (POD Interview 11).

Exchanging Information (Appendix V2; A.75)

> Tacit knowledge facilitates information exchange (MC Interview 9).

Effective Communication (Appendix V2; A.76)

> You gain knowledge through communicating with people (JG Interview 3).

Service Provision (Appendix V2; A.77)

> The service cannot be provided effectively if is run as a business (CM Interview 22).

Example

The data suggests that knowledge in policing is complex, multifaceted, and borne of complex mandates. Centrally administered bureaucratic policy has been the order of the day. However, it has not led to any discernible reduction in crime figures in recent years.

Effective Resource Allocation (Please See Resource Deployment Appendix A.33)

Role Delineation (Appendix V2; A.78)

> **Specific role delineation leads to knowledge and expertise (LW Interview 2).**

Recruitment (Appendix V2; A.79)

> **Recruitment gaps lead to knowledge loss (JMCD Interview 25), (COCUL Interview 14), (ACL Interview 17).**

JIT Training (See Training Appendix A.35)

Learning (Appendix V2; A.80)

> **Learning begets knowledge (POD Interview 11).**

Measuring Crime (Appendix V2; A.81)

> **Tacit policing knowledge cannot be measured, only shared (DB Interview 23).**

Communicating Decisions (Please see Effective Communication A.76)

Interaction (Appendix V2; A.82)

> **Interaction with people increases knowledge (MC Interview 9).**

Example

The data suggest that the recent consolidation and centralisation of police locations have had a negative effect on local communities who are now bereft of local police and the local knowledge that accrued as a result of this.

Recognition of Seniority (Appendix V2; A.83)

Strategy should be directed by executive members of the organisation (ACL Interview 17).

Figure 24 Research O3 Table

Knowledge	Practices	Information	Technology	Resources	Training / Education	Miscellaneous
Capturing Knowledge	Effective Functioning		Implementing Knowledge Through Technology	Discretion	Training	Focusing
Structuring Knowledge Processes	Effective Broadcasting			Allocating Resources	Differences between Training and Education	Timing
Formalising Information	Maintaining Competency				Utilising Technology and Culture	Accepting Change
Integrating Knowledge and Knowledge Practice	Relationship Building				Training Shadowing	Acknowledging Weaknesses
Awareness of Knowledge Gaps	Succession Planning					Demonstrable Ability
Knowledge and Reputation	Clarification of Mandate					Credibility
Capturing Knowledge	Historical Practice					Interrogation
Knowledge Approach	Budgetary Planning					Innovation
Actioning Siloed Knowledge	Networking					Oversight
Utilising Experiential Knowledge	Formalising Roles					Observation
Capturing Tacit Knowledge						Motivation
Capitalising on Individual Knowledge	Innovating					Reducing Statistical Dependence
Standardising Knowledge						Improvising
Encouraging Tacit Knowledge						
Cultural Knowledge						
Publicising Knowledge						
Conflating Knowledge Practice						
Knowledge Handover						
Utilising Knowledge Experts						
Progressing Knowledge and Learning						
Knowledge Awareness						
Supporting Knowledge Practice						
Overseeing Knowledge Initiatives						
Protecting Knowledge Initiatives						

Knowledge	Practices	Information	Technology	Resources	Training / Education	Miscellaneous
Assessing Knowledge Risk						
Committing to Knowledge Practice.						
Individualising Knowledge						
Supporting Knowledge Initiatives						
Personalising Knowledge						
Analysing Knowledge						
Measuring Knowledge						
Governing Knowledge Practices						
Self-Promoting Knowledge						
Knowledge used to Protect and Instruct.						

Structuring Knowledge Processes (Please see Structuring Knowledge; Appendix A.42).

Formalising Information (Appendix V2; A.84)

Formalising / Structuring information makes dissemination easier (JG Interview 3).

Integrating Knowledge and Knowledge Practice (Appendix V2; A.85)

Integration makes for opportunistic possibilities (CE Interview 5).

Awareness of Knowledge Gaps (Appendix V2; A.86)

Knowledge gaps create deficits in service delivery (COCUL Interview 14)

Example

The data indicates that a lack of knowledge can reduce confidence in policing, particularly in relation to legislative implementation, and because of this, there is a proliferation of ad hoc knowledge templates in the organisation to assist in coherent legislative interpretation, but these have not as yet been made official or available to all front line members.

Knowledge and Reputation (Appendix V2; A.87)

> **Knowledge holders could get a reputation and then be targeted for their information, meaning people will not try learning the requisite content themselves (JMCD Interview 25)**

Knowledge Approach (See Assessing Knowledge Appendix A.11)

Actioning Siloed Knowledge (Appendix V2; A.88)

> **We need to action siloed knowledge, or lose it (JN Interview 8)**

Example

There is awareness that ad-hoc or siloed knowledge exists in the organisation, however it is compartmentalised and needs to be made official. This forms part of the recommendations of this work and makes it relevant to the organisation going forward that siloed knowledge should be made available to all so that all can benefit from it.

Utilising Experiential Knowledge (Please see Documenting Knowledge; Appendix A.43, and Knowledge Transfer; Appendix A.8)

Capturing Tacit Knowledge (Pleases see Capturing Knowledge; Appendix A.23 and Tacit Knowledge Generation; Appendix A.17)

Capitalising on Individual Knowledge (Appendix V2; A.89)

> **We have individual knowledge in the organisation, but we don't capitalise on it (ACL Interview 17)**

Standardising Knowledge (Please see Accrediting and Standardising Knowledge; Appendix A.9)

Encouraging Tacit Knowledge (Appendix V2; A.90)

It is a challenge to capture tacit knowledge (PM Interview 10).

Cultural Knowledge (Appendix V2; A.91)

Our culture is not one of sharing knowledge (AM Interview 4).

Example

This has been highlighted in the data i.e., the discrepancy that exists between the knowledge necessary for effective police work and the elements of confidentiality that must be bestowed on some knowledge and knowledge interaction in order to make it viable.

Publicising Knowledge Appendix V2; A.92)

We can do better and publicise what we do better (POD Interview 11).

Conflating Knowledge Practice (Please see, combining Knowledge Practice; Appendix A.14)

Knowledge Handover (See "Knowledge Transfer"; Appendix A.8)

Utilising Knowledge Experts (Appendix V2; A.93)

Knowledge experts leave the organisation with the potential for knowledge loss (JN Interview 8).

Knowledge and learning (Appendix V2; A.94)

Learning, training, and knowledge transfer are synonymous (DCT Interview 15).

Supporting Knowledge Practice, Please see Reconciling Knowledge Practice (Appendix A.50), Classifying Knowledge Practice (Appendix A.53), Combining Knowledge Practice (Appendix A.14), Restricting Knowledge Practice (Appendix A.3), and Knowledge assessment Practice (Appendices A.11 and A.12)

Overseeing and Protecting Knowledge Initiatives (Appendix V2; A.95)

These initiatives are not supervised and managed (JMCD Interview 25).

Knowledge risk (Appendix V2; A.96)

It is a risk having knowledge holders if we do not assess and utilise their knowledge (GS Interview 7).

Example

The lack of knowledge inculcation is seen as a risk because it confirms that knowledge is seen as an asset and something that needs to be captured in the organisation. This lends further credence and relevance to this research and what it is trying to accomplish.

Committing to Knowledge Practice, (see Appendices V2 A.3, A.14, A.50, A.53 and A.85)

Individual Knowledge/ Personalising Knowledge (Please see the following);

Assessing Knowledge;(Appendix V2 A.11)

Knowledge Hoarding; (Appendix V2 A.16)

Delivering Value; (Appendix V2 A.24)

Ranking Knowledge Assets; (Appendix V2 A.48)

Informal Knowledge Gathering; (Appendix V2 A.58)

Self –Regulation; (Appendix V2 A.72)

Role Delineation; (Appendix V2 A.78)

Interaction; (Appendix V2 A.82)

Actioning Siloed Knowledge; (Appendix V2 A.88)

Capitalising on Individual Knowledge; (Appendix V2 A.89)

Supporting Knowledge Initiatives (Please see the following);

Supporting information initiatives; (Appendix V2 A.30)

Knowledge Resourcing; (Appendix V2 A.46)

Championing Knowledge; (Appendix V2 A.55)

Self –Regulation; (Appendix V2 A.72)

Analysing Knowledge (Appendix V2; A.97)

We may not retain people just because of the risk of loss to institutional memory (CCM Interview 1).

Measuring Knowledge (Appendix V2; A.98)

We cannot measure the knowledge we pass on, it is how we are progressing that could be looked at (AC Interview 16).

Example

Knowledge measurement is a critical factor in policing, as the intangible issues of innovation, discretion, local knowledge and decision-making ability are the heart of policing. Having mechanisms to look at these objectively is at the heart of the recommendations in this work, and the ability to capture this type of somatic and discursive knowledge and pass it on is what will benefit policing going forward

Governing Knowledge Practices. Please see:

Restricting knowledge practices (Appendix V2; A.3)

Knowledge Assessment Practice (Appendix V2; A.12)

Disparate Practices (Appendix V2; A.19)

Accumulating knowledge (Appendix V2; A.45)

Classifying Knowledge Practice (Appendix V2; A.53)

Self –Promoting Knowledge (Appendix V2; A.99)

You have to put yourself forward to do what needs to be done, and this can mean being resourceful (DB Interview 23).

Knowledge used to protect and instruct (Appendix V2; A.100)

The dangers of knowledge and potential exposure if knowledge is not properly utilised and people are not up skilled. (DB Interview 23).

Effective Functioning (Appendix V2; A101)

In order to function effectively, we have to forgive and be able to move on and learn from it (CCM Interview 1).

Effective Broadcasting (Appendix V2; A102)

The effectiveness and speed of information dissemination is evident, but it places pressure to ensure the information is correct.

Maintaining Competency (Appendix V2; A103)

Knowledge is not necessarily related to competency; it is not a given that a knowledge expert is a competent person (CE Interview 5).

Example

This is a crucial example that illustrates the fact that a knowledge expert in one area does not make a knowledge expert in all areas. This lends gravitas to the recommendation that training should be compartmentalised in order to produce legitimate, policy backed knowledge experts (such as those that have arisen in an ad-hoc fashion in response to a lack of knowledge), in certain specialised areas, including front line policing. It is crucial that front line policing is seen and valued as a specialist area in itself.

Relationship Building (See Knowledge and Reputation (Appendix V2; A87)

Mandate Clarification. Please see;

> **Policing by Consent (Appendix V2; A.32)**
>
> **Security (Appendix V2; A.40)**
>
> **Knowledge Dissemination (Appendix V2; A54)**
>
> **Hiring Practices (Appendix V2; A.62)**

Historical Practice (Appendix V2; A104)

> **This organisation is couched in historical practices that make it difficult to move it forward without the requisite buy- in (DG Interview 6).**

Budgetary Planning (Appendix V2; A105)

> **Budgetary control is difficult as someone will always feel hard done by (MC Interview 9).**

> **This organisation does not manage its budgets well (MC Interview 9).**

<u>Networking Please see;</u>

> **Knowledge Networking (Appendix V2; A105)**

> **Effective Communication (Appendix V2; A.76)**

> **Firefighting (Appendix V2; A68)**

> **Informal Knowledge Gathering (Appendix V2; A.58)**

> **Communicating (Appendix V2; A.29)**

<u>Formalising Roles (Appendix V2; A.106)</u>

> **The mandate is complex and subjective, and it is not formalised (CM Interview 22).**

<u>Innovating</u> (Appendix V2; A.107)

> **Intrusive oversight stifles innovation (DCT Interview 15).**

<u>Implementing knowledge Through Technology (Appendix V2; A.108)</u>

> **Knowledge is not being utilised properly through effective technology (CM Interview 2)**

<u>See Also</u>

> **<u>The utilisation of technology (Appendix V2; A.31)</u>**

> **<u>Restricting Paperwork (Appendix V2; A.37)</u>**

> **<u>Knowledge Resourcing (Appendix V2.A.46)</u>**

> **<u>Knowledge Adaptation (Appendix V2; A.56)</u>**

> **<u>Overuse of Statistics (Appendix V2; A.70)</u>**

> **<u>Discretion (Appendix V2; A.109)</u>**

> **Discretion is eroded with too many rules and procedures (BS Interview 19), (BMCP Interview 18), (CM Interview 22).**

Allocating Resources (See Resource Deployment (Appendix V2; A.33)

Difference between Training and Education (Appendix V2; A.110

Training does not necessarily educate; it has to come from experience and the individual's Abilities (DOCUL Interview 14).

Utilising Technology and Culture (Appendix V2; A.111)

Culture and Information need to be open to the challenge of analysis and research (GS Interview 7).

Training (Shadowing) (Appendix V2; A.112)

We do not have the resources to shadow anyone; it is luxury for us (BMCP Interview 18).

Focusing (Appendix V2; A.113)

This organization needs to be judged on a range of issues and not just focus on crime stats (DG Interview 6).

Timing (See Knowledge Loss Appendix V2; A.1)

Accepting Change (Appendix V2; A.114)

We don't need change for change sake (LW Interview 2).

Acknowledging Weaknesses (Appendix V2; A.115)

We do not know what staff we are going to need in the future, we need to acknowledge this (AM Interview 4).

Demonstrable Ability (Appendix V2; A.116)

> We demonstrate our ability in a knowledge context by our stewardship of it (AM Interview 4).

Credibility (Appendix V2; A.117)

> Lack of knowledge capture is linked with lacking credibility (ACL Interview 17).

Example

The data has indicated that a lack of knowledge can lead to a myriad of issues in relation to credibility and confidence. Not only from members of the public but confidence that emanates from a competent police officer. Knowledge and credibility are synonymous, and the data reflects this with front line police officers citing a lack of confidence in their own ability when challenged, for example by members of the public on points of law and legal interpretation.

Interrogation (Appendix V2; A.118)

> Good police work needs to be interrogated and stand up to scrutiny, and knowledge is an enabler of this (JK Interview 13).

Oversight, Please See:

Knowledge Loss (Appendix V2; A.1)
Knowledge Sharing (Appendix V2; A.8)
Governance (Appendix V2; A.25)
Training (Appendix V2; A.35)
Reconciling Knowledge Practice (Appendix V2; A.50)
Data Protection (Appendix V2; A.65)
Innovating (Appendix V2; A.107)

<u>Observation (Appendix V2; A.119)</u>

Knowledge is about observing myriad practices that lead to an accumulative experience (JK Interview 13).

<u>Motivation (Appendix V2; A.120)</u>

Encourage knowledge holder to impart their knowledge by motivating them in the final years of their service (JMCD Interview 25).

<u>Reducing Statistical Dependence (Appendix V2; A.121)</u>

Police work has to be more than just analysis and results (DMMC Interview 24).

<u>Improvising (Appendix V2; A.122)</u>

Improvising work practices can increase knowledge flow (SK Interview 26).

5.11 In-Vivo Coding; Findings

Research Objective 1

Moving from the process coding phase of this research, it is now proposed to analyse the causality or effect of the issues raised in the data through a process of in-vivo coding.

1. Knowledge loss appears to play a substantial role in policing, with it being described as a risk and a challenge by respondents. It is also pointed out that it does not appear to be captured effectively in the organisation and is a concern for policy-makers. Knowledge loss has also been cited as a causal link between personnel deployment and planning (Griffiths *et al.*, 2016). There appears to be an acute awareness of the issue of knowledge loss and this has led to the formation of unstructured knowledge practices within the organisation which do not appear to be directly supported or enabled by policy. (Appendix V2, A.1).

2. Knowledge loss in the organisation has also been expressed in terms of lack of "handover" time and unclear role delineation. There does not appear to be any firm knowledge handover policy at present in the organisation which may or may not be linked to a lack of clear knowledge policy around succession planning, which does not appear to be in evidence. However, the data suggests that knowledge is difficult to capture in such a complex environment and capturing it before it is lost is extremely difficult, a view echoed by Gottschalk, who suggests that capturing knowledge in a policing environment is a complex undertaking (Gottschalk, Holgersson and Karlsen, 2009). (Appendix V2, A1).

3. Accessing knowledge and knowledge repositories appear to be an issue with the data suggesting uncertainty as regards access to relevant knowledge for legislative interpretation and policy implementation. The way in which information and knowledge and information have also fundamentally changed with the growth in information technology (Nordin, Pauleen and Gorman, 2009a). This could serve to increase an already complex mandate with further difficulty and is also suggestive of the assertion that knowledge dissemination needs to be formalised, as it appears to be a "free-flow "of information and knowledge without discernible structure. (Appendix V2 A.2).

4. A lack of knowledge in any situation can lead to but not necessarily imply a lack of clear procedures however the data in this case does not suggest an uncertainty around knowledge, rather, uncertainty as to the most expedient ways to disseminate it. (Appendix A.5).

5. The data suggests that tacit knowledge is very much in evidence; however, it is isolated and not necessarily encouraged in the organisation, particularly if it is at odds with procedural, formal, or process-based knowledge. (Appendix V2 A.17 & A.90).

6. With regard to knowledge transfer and knowledge sharing, the data suggests that when knowledge is transferred on an unstructured basis, it loses its efficacy. This leads to an issue of staffing "gaps." This is a problem compounded by a recent moratorium on recruitment that has led to knowledge (both tacit and explicit) not being transferred and shared. (Appendix V2, A8 & A8A).

7. Senior management officials in the organisation also expressed concern that knowledge is not treated as a "business tool," which adds to the data that suggests substantive knowledge policies are not in place, particularly around succession planning, as mentioned. (Appendix V2, A.73)

8. Knowledge sharing is an interesting and complex phenomenon in itself, (Lam and Lambermont-Ford, 2010), and in a policing context, it appears as though there is a reluctance to share it, which the data suggests is due to the culture, which is cloistered and nuanced in public sector specifics. There also appears to be a lack of policy in relation to capturing it, and a lack of succession planning, as discussed. The data also suggests that the organisation sees itself as lacking in coherent knowledge sharing practice, as it is only carried out on an unstructured basis. This encourages silos, and while management is aware of their existence, no policy to date has been enacted to capitalise on individual knowledge. (Appendix V2, A.8 & A8A, A5, A89).

9. The data suggest that knowledge sharing will not occur if there is no appetite for reciprocity and that there is a "fear" of sharing information because of possible power shifts. This also leads to knowledge loss as people retire, and their knowledge leaves with them. Informal knowledge sharing is not encouraged in the organisation and this is perhaps related to the amount of oversight and concern around potential scrutiny. (Appendix V2. A8 & A8A, A.25).

10. Some members of senior management have championed the value of knowledge autonomy in order to run their own districts or divisions; however, some have suggested the contrary citing that if knowledge practices are not standardised throughout the organisation, policing practice will suffer (Appendix V2, A.25, A.45, A.53).

11. There appear to be disparate /unstructured practices for capturing knowledge in the organisation. The data suggests the technology has a part to play, but overall, the suggestion appears to be that knowledge is not captured in any meaningful way, and it is accepted as a challenge to capture it (Appendix V2, A89, A117, A.23).

12. Knowledge appears to be the subject of misinterpretation insofar as the interpretation of legislation is concerned, and this can lead to intense scrutiny by a myriad of oversight bodies and policies emanating from same. However, the data suggest that the very issue of discretion that forms the nexus of police work is mitigated by the necessity of adherence to rules and procedures (Appendix V2, A109, A.25).

13. Assessing or measuring knowledge in policing is tenuous insofar as individual knowledge is concerned (Zyngier and Venkitachalam, 2011), and the data reflects this with suggestions that there are not enough resources to assess knowledge, uncertainty over how to assess it, and an antecedent lack of identification of suitable knowledge holders in order to define the parameters. However, the data also suggests that knowledge holders can know "too much," and this could represent an unbridled approach to knowledge dissemination with no structure to contextualise it (Appendix V2, A81, A.98).

14. In relation to knowledge assessment practices, lack of resources is cited as a contributory factor, along with a recognition that suitable knowledge assessment practices do not exist in order to identify knowledge holders. Utilisation of resources is a palpable issue in policing (Barton and Valero-Silva, 2013) and one in which effective knowledge policy can assist with. The lack of suitable knowledge assessment practices has also been suggested as a factor with regard to lack of knowledge awareness and knowledge dissemination (Appendix V2, A.11).

15. Knowledge dissemination in the organisation also appears to be carried out on an unstructured basis, and this is true for the deployment of personnel which appears to be carried out on the basis of personnel strengths rather than knowledge and experience (Appendix V2, A 54).

16. There is a vast amount of knowledge awareness in the organisation, but it does appear to be location- specific, and appears to emanate from a lack of awareness of specific knowledge holders, who, symbiotically, have come to the fore because of the lack of a lack of knowledge availability in the first place (Appendix V2, A.15).

17. In relation to knowledge hoarding, the data suggests that it occurs in the organisation, and the suggestion is that if knowledge were shared more overtly (perhaps with encouragement and policy implementation from the organisation), this could be reduced (Appendix V2, A.).

18. Tacit knowledge has been mentioned in the data, and it has been suggested that it is necessary in relation to policing practice. There are issues mentioned in relation to tacit knowledge and the security of data and policing (which is necessary in relation to some criminal investigative practice). However, it is also suggested that if knowledge

were more effectively "channelled" it would reduce the requirement for tacit knowledge generation and existing tacit knowledge and experience could be channelled into policy and practice (Appendix V2, A.17, A.90).

19. The complexity of policing makes for a myriad of assumptions around how the it conducts its business (Nordin, Pauleen and Gorman, 2009a), and this is reflected in the data, which suggests that there is no consistency to how a policing organisation conducts in business, rather, it does it in response to shifting societal and governmental mandate (Appendix V2, A.32,A.40, A.54, A.62. A.106).

20. The data suggests that in relation to knowledge, the organisation is essentially in line with international best practice; however, this is also related to ongoing training (Appendix V2, A.107, A.11, A.17, A.18, A.35).

21. In relation to knowledge delivering value to the organisation, the overarching premise appears to be that knowledge could deliver on value if it was correctly and coherently channelled and recognised, a view echoed by Griffiths (Griffiths *et al.*, 2016). However, individual knowledge does not seem to be valued collectively, and therefore not captured as efficiently as it might be (Appendix V2, A.51, A.122, A.89).

22. The governance processes in the organisation, have, as mentioned, been linked closely to knowledge and knowledge sharing and interpretation. The data suggests that governance is directly related to the sharing of knowledge as it can impede the desire to share knowledge due to fear of repercussion. The data also suggests that the governance practices in policing have the potential to reduce innovation due to their potential overlap and confusing remit (Appendix V2, A.25, A.8, A.8A).

23. The data suggests that there is a lack of support for initiatives within the organisation and this may be due to lack of investment or staff "buy-in" to new programmes, such as the "Modernisation and Renewal" programme currently underway (Appendix V2, A.53, A.57, A.106).

24. Centralisation of resources and processes has also been discussed, but only in relation to its complexity, however, the prevailing paradigms of New Public Management are the centralisation of support services (Diefenbach, 2009) and this includes finance and budgeting, rostering and allowances, and overtime allocation (Appendix V2, A.A.27).

25. The complexity of policing is further alluded to in the data with the recognition that it is a complex environment to be working in and that knowledge in policing (if effective) bestows choice on the front-line police officers. This can only be enhanced by clear lines of communication, which is apparent in some areas, but the data also suggests that it in some areas this is more of an aspiration than a reality, with, the suggestion, for example, that, amongst other things, communication effectiveness can be marred by excessive oversight (Appendix V2, A.25, A.35, A.43, A.50).

26. Technology is comprehensively utilised throughout the organisation, as it is in all policing environments (Barton and Valero-Silva, 2013), and the provision of the internal computer systems have meant that data can now be drawn from other sources, such as the courts and justice services which can provide a comprehensive data profile of crime, crime statistics, and crime trends. However, the data suggests that the organisation is not necessarily adapting well to technology as it requires ongoing investment in terms of training and resources, and there is some suggestion that it is

not fit for purpose due to lack of management support, lack of resources, and lack of relevant training (Appendix V2, A.56, A.88, A.108, A.111, A.31).,

27. The organisation polices by "consent", or the will of the people (Jackson, Hough, *et al.*, 2012), and the data supports this, but the suggestion is that this may not last, as the incidents of violent and armed crime continues to rise. The organisation is at present approximately 70% unarmed, however this percentage is falling with the introduction of regional armed support units and an increase in armed detective strengths (Appendix V2, A.32).

28. The deployment of resources seems to be a contentious issue, as it appears to be unclear and conducted on unstructured basis. An Garda Síochána does draw from the experiences of other police services in relation to this and resource deployment is an ongoing issue in the organisation's "civilianisation" initiative (Appendix V2, A.13).

29. The data suggests that training in the organisation is an emotive issue, and it is one that has surfaced again and again in the data. The data suggests that training has to be re-defined, the remit is too broad, and it is not well thought out and delivered. The data also suggests that knowledge and experience are well catered for in training and that it could be more effective if knowledge holders were identified prior to its delivery (Appendix V2, A.35, A.110).

30. The current policing knowledge environment is challenging, and the data echoes the literature here closely in that it suggests the cloistered environment of the public sector and public sector hierarchies have a bearing on the ability of the organisation to share knowledge (Massaro *et al.*, 2015).

The data also suggests that the present environment in the organisation is one of caution and suspicion and that some of the change initiatives currently underway will not necessarily lead to progress or an increase in knowledge capability (Appendix V2, A.8, A.8A).

31. Paperwork and the volume of it do not appear to have been mitigated by the increased use of technology, and the data suggests that it is not managed well in the organisation. It is suggested that a front-line police officer spends on average, 70% of their time completing paperwork. The data also suggests that paperwork is not managed efficiently in the organisation (Appendix V2, A.37).

32. The data suggests that the organisation, (while undergoing change) does not like change and it will only come from cultural shifts. The increase in accountability and oversight has not changed the way the organisation runs or is run, and the changes that are being brought to bear do not emanate or does not appear to be representative of front-line police officer attitude (Appendix V2, A.25, A.38, A.48).

33. The issue of legislation and legislative knowledge is something that is imposed in the organisation and the data suggests that it is not reflected in appropriate continual professional development and developmental training. There appears to be a dichotomy between the explicit knowledge required to enact legislation and the tacit experience necessary to interpret and take action on the basis of it (Appendix V2, A.51, A.81, A.90, A.119). A.39).

34. In terms of security, the data suggests that it is a broad remit, ranging from state security, to the security of knowledge, information, and data. The organisation appears to recognise the need for security but does not appear to have a coherent

strategy around it; rather the data suggests that it is aspirational rather than practical, with, for example a suggestion that the organisation needs to secure data, and needs to look at potential breaches of same, but does not appear to be engaged in doing so (Appendix V2, A.40. A.66, A.18).

Research Objective 2

1. The data indicates that the value of knowledge can be expressed in many ways; however, there is an "entitlement" to knowledge which is born of effective training and the simple maxim of being entitled to know what is necessary in order to carry out a policing role; however, this role has to be contextualised and practical in terms of its remit (Reiner and O'Connor, 2015). The data also indicates that knowledge holders should be entitled to share or hold their knowledge as they see fit (Appendix V2, A.41).

2. Knowledge, if structured, can be assessed in order to measure its effect on organisational efficiency (Heisig, 2009); however, in a policing context, the data suggests that it is difficult to put formal knowledge processes in place due to the complexity and broad mandate of policing. Knowledge structures may also be difficult to inculcate due to existing hierarchical norms; however, knowledge is also needed in order to implement coherent governance (Appendix V2, A.111, A.120, A.1, A.3).

3. The data suggests that knowledge needs to be formalised in order to capture and put it into context, and this would add significant value to processes in terms of its openness to capture tacit and experiential knowledge (Appendix V2, A.42, A.106, A.8, A.117, A.1).

4. The organisation does have comparable knowledge statistics to other police forces (see chapter 3), however, knowledge does not appear to be scaled and planned for, and this may be due to a lack of understanding of the scale of its own remit, which frequently changes (Appendix V2, A.24, A.70).

5. The data suggests that accumulated knowledge has a role to play in policing, requires a build-up over time, and enables people to make effective judgements; however, there is no provision for this at present (Appendix V2, A.21, A.35).

6. The data suggests that there is a lack of resources to utilise knowledge effectively, and these resources may not even be available in the future. There is an acceptance that an inadequately equipped police force will soak up resources, both from inadequate training and incorrect deployment (Dean, Filstad and Gottschalk, 2006), but data suggests that regarding knowledge, the gap between what it needs to do and what it wants to depends entirely on resources (Appendix V2, A.47, A.96, A.100).

7. The value of knowledge has also been recognised in terms of knowledge ability, and the data suggests that the organisation is unsure of its own abilities in terms of knowledge, and it does not utilise knowledge properly as a result (Appendix V2, A.116, A.47).

8. Knowledge "assets" are not ranked, and this has the effect of restricting knowledge flow in the organisation. This has an effect on knowledge decisions, which do not appear to be used effectively to support front line policing (Appendix V2, A.48).

9. There is also a discernible knowledge gap in terms of a manifest lack of frontline knowledge, which indicates that front line police officers sometimes arrest first and reconcile the arrest with legislation later. This would indicate a knowledge deficit that needs to be addressed. This gap is further articulated in terms of the disparity between real-world and organisational expectations, which also manifests at the policing front line (Appendix V2, A.86, A.1, A.8. A.11).

10. Knowledge and experience are somewhat synonymous, and the value of tacit knowledge in policing is well documented (Dean, Fahsing and Gottschalk, 2006). However, the data suggests that the tacit component of knowledge and experience is very much in evidence; however, this also leads to difficulties in replacing this knowledge. There is an awareness of this; however, there does not appear to be any steps taken to mitigate it. Further, there is a suggestion that crime should now be "costed" in order to provide maximum value for investment, and this may lead to knowledge and experience being underutilised in deference to process, procedure, and financial pressure (Appendix V2, A.17, A.18, A.23, A.24, A.34, A.35).

11. The data suggests that automated knowledge in the form of "autonomous" training can lead to assumptions, and a lack of innovation and discretion, and this undervalues knowledge and mitigates the tacit /experiential component of it. (Appendix V2, A. 35, A.52).

12. The organisation appears to be slow at disseminating knowledge, and complexity is cited as a reason for this ('The Met ' s Direction : Our Strategy 2018-2025 Contents', 2018). This has also led to a rise in the numbers of amateur knowledge champions that have arisen, and it has been suggested that this has happened because of a lack of effective knowledge dissemination (Appendix V2, A.54).

13. The organisation appears to be proficient at adapting to the various demands placed upon it; however, it appears to use other policing models and processes and adapt them as its own, such as the "PULSE" system, and despite a demand an recognition of the value of knowledge in helping with adaptation, it has been suggested that this has led to high levels of resistance to change (Appendix V2, A.56, A.88, A.108, A.56).

14. The organisation is data-rich, however the processes for sharing this data are not clear and knowledge silioism, (even procedurally) is evident, ergo knowledge is not being utilised to its potential because it is compartmentalised (Appendix V2, A.8, A8A, A.31).

15. The gathering of informal knowledge has also been documented, and it appears to be directly linked to informal networking and "knowing who to call." The data suggests that this is seen as an effective way to conduct police business, married to discretion and informal knowledge generation and sharing; however, it is localised and not practised throughout the organisation (Appendix V2, A. 58).

16. Knowledge does not appear to be evaluated in the organisation and this makes it difficult to assess its efficacy. It would appear that there are virtually no formal knowledge practices in place, and this has led to a lack of quantification of knowledge and knowledge metrics (Appendix V2, A.51, A.98).

17. Hiring practices are suggested as being complex, as it is difficult to hire the correct people given the complex mandate of policing (Appendix V2, A.62).

18. There are strategies in force and underway, as with most modern police forces (see chapter 3); however, in this case, the data suggests that a knowledge strategy is not on the agenda, nor is an exit strategy for departing personnel, whose knowledge is potentially lost when they transfer, leave, retire, or resign (Appendix V2, A.8, A.63, A.83, (Boateng, 2008).

19. Data protection is an issue for the organisation, as it involves cost and specific challenges to policing, as the data suggests that policing needs to protect people but needs access to data to carry this out. However, there is an increasing risk of exposure to data contravention, particularly in relation to criminal investigation (Appendix V2, A.57, A.65).

20. In relation to individual knowledge, the data suggests that there is a level of exposure to front line police officers through a lack of effective knowledge transfer and support, which can leave a police officer exposed to potential physical or litigious repercussion; moreover, in some cases, it appears to be up to individuals to apprise themselves of new legislation, or policy, and interpret it accordingly (Appendix V2, A.89, A.8).

21. The use of statistics and analysis play a large role in policing; however, the data indicates that this has been overused and does not take into account the value of tacit knowledge, experience, or the use of discretion (Appendix V2, A.70).

22. There does not appear to be a policy in place to document or protect knowledge, and this also appears to be the case in relation to data and information (other than legal obligations under various sections of legislation) (Appendix V2, A.95, A.100, A8A).

23. Communication and information is a key component of policing (Hough, 2010); however, there appears to be a call for more consistent lines of communication to maximise knowledge value (Appendix V2, A.76, A.8, A.13, A.17, A.18, A.29).

24. Service provision is mentioned in the data, and it is suggested that a policing service cannot function as such if it is run as a business, knowledge practices have to be more robust and consistent if service delivery is to continue to be effective (Appendix V2, A.34, A.57, A.77).

25. Role specificity is discussed, and there appears to be an inconsistency about this issue, as it is not necessarily directly related to the accumulation of knowledge and expertise and recognition of knowledge holder's experience (Appendix V2, A. 78, A.106, A.1).

26. The data indicates that measuring crime and the effective measurement of crime has to take on board the fact that discretionary policing needs to be measured in some context, and statistical data only tells a portion of the story (Barton and Valero-Silva, 2013). Monetising policing for example, can lead to a slanted view of the efficiency of a police service, and this may not present an overall reflection of its ability or potential (Appendix V2, A.81).

27. The data suggests that some level of decision making should come from the front line, as this involves relevant interaction with the public and the knowledge gained from this (Appendix V2, A.49, A.18, A.33).

Research Objective 3

1. It appears from the data that formalising information and knowledge and presenting it in a more universal manner would be of practical benefit to the organisation. The data appears to suggest that "knowing your audience" is a key factor in the practical dissemination of information and that by implication, knowledge may need to be compartmentalised with regard to various sections within the organisation (Appendix V2, A.54, A.84).

2. The data suggests that integrating knowledge and knowledge practices (for example from the PULSE system) may lead to opportunities that have not yet been exploited by the organisation. The data also suggests that understanding knowledge is a key point, and it is not something that is part of the formal training or educational processes in the organisation (Griffiths *et al.*, 2016), (Appendix V2, A.85).

3. There does appear to be, (as mentioned), knowledge "gaps" in the organisation and while there is an awareness of these, the data suggests that these gaps create deficits in service delivery and potential loss of knowledge from departing personnel (Appendix V2, A.86).

4. The data suggests that organisation appears to have a reputation for withholding knowledge and this can stem from knowledge holders being reluctant to divulge their information and knowledge and also from a potential "fear" that they may be "targeted" for their information, and not be rewarded for it. People may also abdicate responsibility to the knowledge holder and not try and learn for themselves (Appendix V2, A.36, A.87).

5. Siloed knowledge appears to be very much in evidence in the organisation, and it (as mentioned), can contribute to knowledge hoarding, which in turn is linked with the existence of individual knowledge champions. The data suggests that the organisation does have a somewhat compartmentalised approach to knowledge, and this is something that may need to be addressed by the provision of a cohesive knowledge management policy to allow for the inculcation of knowledge from knowledge champions or silos (Gottschalk, Holgersson and Karlsen, 2009), (Appendix V2, A.16).

6. The data suggests that the individual knowledge available in the organisation is not capitalised on. As mentioned, there is a potential reticence on the part of some individuals to share knowledge born of a concern that they may be "pigeonholed" into specific roles. The data suggests that the organisation does not appear to treat knowledge as a business tool, and which could be necessary in order to implement a cohesive knowledge management system (Appendix V2, A.8, A8A. A.89, A.1).

7. Tacit knowledge is necessary for policing, the capitalisation of which the organisation does not appear to drive or encourage. There appears to be a lot of enthusiasm and awareness of the benefits of tacit knowledge, however, there does not appear to be any coherent measures to try and capture or capitalise on individual's experience, qualifications, and knowledge (Appendix V2, A.17, A.90).

8. The data suggests that there is a drive to increase police presence and police integration with the community in the form of "community policing" (Davies and Thomas, 2003). It also suggests that a strong culture and a strong integrative stance can increase knowledge sharing and dissemination. xxx It must also be borne in mind that complex mandate of policing, with the requisite mandates not least from the

criminal justice system and legal obligation can mitigate the generation of tacit knowledge and influence levels of discretion that may be available and necessary for frontline police officers, in particular situations (Appendix V2, A.111, A.1, A8).

9. Utilisation of knowledge experts in the organisation is a phenomenon that is mentioned in the data however; the data suggests that their knowledge would have to be assessed before it could be inculcated into organisational practice. It is also mentioned in the data that knowledge experts expose the organisation to greater knowledge loss and potential risk as a result of knowledge loss (Appendix V2, A.31, A.93, A.8).

10. The data suggests that the organisation is aware of the practicalities and benefits of learning, training, and knowledge transfer; however it also appears to be aware that there is a lack of documentation of these procedures. This can result in a substantial amount of learning and not retained in the organisation (Appendix V2, A.8, A.35).

11. The policies and procedures in the organisation are complex and there is a suggestion in the data that these are not coherently and centrally managed. They appear to be authored rather, by various sections within the organisation. These "initiatives" have brought about their own knowledge issues in terms of "gaps" in information which frontline police officers suggest has the potential to cause confusion, as a result of disparate mandates emanating from within the organisation (Appendix V2, A.71, A.94, A.106). The literature supports this with Wakefield, for example, suggesting that the type of training that is most effective when it comprises "passed on" knowledge, i.e. from colleagues and not in a formal capacity (Wakefield, 2008).

12. The data suggests that knowledge could be channeled more effectively in the organisation and utilised in decision making to a greater extent, particularly in relation to frontline police officers who may have to make split-second decisions. It is also suggested that knowledge is disseminated on an unstructured basis, this gives rise to individual knowledge holders; however, there is also data to suggest that these knowledge holders should not be retained solely because of their potential loss to institutional memory (Appendix V2, A.17).

13. The data suggests that knowledge, if not utilised correctly, poses a potential risk to police personnel, i.e., the risk that people will not be equipped with the requisite skill set and this may increase exposure to litigation or incorrect legislative interpretation (Appendix V2, A.96, A.1, A.8, A8A).

14. Technology is utilised in the organisation effectively, and the effectiveness and speed of information dissemination is increasing, but there does not appear to be specific policies in place to ensure the accuracy of this information and knowledge (Appendix V2, A.31, A.108, A.111).

15. There is also a suggestion that despite the existence of knowledge holders, it is not a given that any knowledge holder or a knowledge expert is necessarily competent (Appendix V2, A.35).

16. The public sector nature of policing (specifically in relation to historical practices and hierarchies et cetera) makes it difficult to institute initiatives and policy without the requisite buy-in from staff. This situation appears to be in evidence in the organisation, as public sector culture (for example, security of tenure) can make it difficult to persuade people to accept change and policy (Appendix V2, A.1, A.8, A.18, A.29). (McAdam, 2000b).

17. The data suggests that the organisation does not manage its budgets well and that budgetary control is extremely difficult, as, for example, certain sections will always feel aggrieved in relation to financial allocation, and certain situations demand immediate resourcing (Appendix V2, A.64, A.105, A.35).

18. Innovation is synonymous with discretion and discretionary practice. The data suggest that in relation to this, the organisation could potentially leverage more resources towards innovation, however; there is a commensurate lack or reduction in discretion given the increase in oversight and legislative policy. The data suggest that in relation to this, the organisation has a high level of governance with commensurately high levels of disparate policies and practices between each (Appendix V2, A.107, A.25, A.52. A.94).

19. It appears from the data that the differences between training and education need to be articulated in a more coherent fashion; for example the data suggests that training does not necessarily educate. This needs to emanate from individual's experience and abilities (Appendix V2, A.110, A.35, A.6, A.29).

20. The data suggests that "shadowing" is a phenomenon that is utilised, however, it appears to be on an unstructured basis and there is also awareness that it is resource intensive and potentially difficult to implement organisation-wide (Appendix V2, A.35, A.112).

21. There is also a suggestion that the organisation should not be judged on crime statistics alone, rather, on a range of social policy and community engagement initiatives. There is an awareness amongst senior management that there is not enough focus on individual's talents and skills or specialised knowledge (Archbold and Schulz, 2008), and this focus needs to shift towards this in order to encourage people to become knowledge-intensive and to their knowledge (Appendix V2, A.70, A.17, A.98).

22. Staffing levels are discussed in the data in relation to uncertainty between civilian and police roles and how best they may integrate in the future (Appendix V2, A.85, A.26, A.30).

23. There is a suggestion in the data that if the organisation does not capture knowledge, it will reduce its credibility and that this has (in any event), substantially reduced in the last couple of years due to various high-profile contentious issues that have been reported in the media.

5.12 In-Vivo Coding Summary

Research Objective 1

Using An Garda Síochána as a case study, the data suggests that in relation to the current state of knowledge management in policing, the situation is somewhat complex. As mentioned, knowledge loss is a cited issue, and this stems from the complex mandate and lack of coherent knowledge policy that appears to pervade the organisation. There is a clear mandate for knowledge; however, the current knowledge landscape involves the brokering of individual knowledge "silos" and disparate knowledge practices that do not appear to cohere well. (Dean and Gottschalk, 2007). There appears to be uncertainty around knowledge and knowledge practice, as well as tangible reasons for it, such as a recent moratorium on recruitment, which mitigated knowledge (particularly tacit) handover.

Tacit knowledge exists, but it appears to be siloed and is transferred on an unstructured basis, and current practices are occluded by what appears to be an onerous amount of oversight. Current practice in relation to knowledge handover is also somewhat complex, as there does not appear to be a coherent succession planning policy, which makes knowledge difficult to capture; this is married to what appears to be a "fear" of sharing knowledge, due to what some front line police officers refer to as a "lack of support" and uncertainty in relation to knowledge practices, however it is critical that knowledge (both tacit and explicit is shared (Seba and Rowley, 2010).

Knowledge dissemination is carried out in the organisation, but it appears to be unstructured, and personnel deployment seems to be carried out based on organisational strengths rather than knowledge and experience. The organisation "shifts" according to prevailing governmental and societal mandate; however, it does appear to be in line with international best practice. There also appears to be an overabundance of governance and this seems to have a mitigating effect on morale, despite its claim to the contrary.

There are clear lines of communication in some areas; however, these appear to born more of public sector hierarchical constructs than knowledge practice, which is typical of the public sector (Nutt, 2006). Technology is comprehensively utilised, however, it does not appear to be supported coherently, with resources being assigned to its development on a reactive rather than proactive basis. Training also appears to be somewhat unstructured, and its remit appears to be broad and does not appear to cater to knowledge and experience through the identification of knowledge holders and the utilisation of their experience and ability.

Legislative knowledge is necessary but does not appear to be supported by formal training paradigms or processes (for example, there are no formal legal qualifications offered). Discretion forms a substantive part of police work; however, it appears to be being eroded by legislation pertaining to GDPR, by oversight, and by the need to protect data from outside threat and from a lack of coherent strategy around it.

Research Objective 2

The value of knowledge and knowledge management in policing is not easy to discern as there are many elements of tacit knowledge, experiential value, and complex interactions with the public, which all have to be addressed in order to form a context from which knowledge and its effectiveness can be judged. However, the data has indicated an "entitlement" to the requisite knowledge required to complete a required duty, be it that of a front line police officer, a specialist scenes of crime investigator, a policy analyst, or a financial manager, and that the value of this knowledge can be judged by the way in which knowledge holders can (or are facilitated in) sharing their knowledge.

It is difficult to value knowledge if it cannot be assessed in some format; however, it appears that it is difficult to put knowledge structures in place in a complex environment such as policing. Governance is required (Filstad and Gottschalk, 2010). However, it appears that it is not sufficient to broker knowledge processes in the organisation, rather, it seems to serve as a knowledge inhibitor, and this may be due to the sheer amount of oversight and governance, both from government and the oversight bodies themselves.

This may in turn, be due to a lack of effective communication and knowledge awareness around policy. The scale of knowledge and knowledge initiatives and the effect of same are not easily discernible. As mentioned, this makes any meaningful attempt to assess its efficacy difficult. However, accumulated and experiential knowledge does have a role to play in policing, but it is not situated accurately or within broader policy constructs.

The organisation does not appear to value knowledge and knowledge ability, and this is manifest in the disparate approach to the subject; for example, knowledge assets do not seem to be ranked, and knowledge dissemination appears to be somewhat disparate, which may

impact on knowledge decisions and could manifest in a lack of knowledge support for front line policing. This potential lack of knowledge and knowledge support has also resulted in what appears to be a knowledge "gap" between the knowledge needed at the front line and the availability of that knowledge. For example, front line police officers often seem to arrest first and justify the arrest later (in terms of relevant legislation).

This would appear to be a dangerous practice and one which could potentially leave front line police officers vulnerable to procedural or legislative consequence.

Value has also been mentioned in terms of the potential cost of crime and using knowledge, for example (coupled with analysis) to analyse the potential cost of resources versus the probability of an arrest may mean in the future, knowledge is used to refuse a police presence purely on the basis of resources and budgetary constraints.

It appears that crime and its effective measurement have to take knowledge value of sorts in order to be measured in context and this is difficult in policing (Jackson, Hough, *et al.*, 2012), as statistical data can only provide a piece of the story. Monetising policing can lead to a slanted view of the efficiency of a police service, and this does not present an overall reflection of its ability.

Knowledge has value in the organisation, however this value does not seem to be formalised via any discernible knowledge practices and does not appear to form part of the organisation's strategic transformational plans (for example, the modernisation and renewal programme), which are currently underway. In relation to individual knowledge, it is suggested that there may be a level of exposure to frontline police officers through a lack of effective knowledge transfer and lack of support. This suggests a value for knowledge at the front line that may need to be addressed. The organisation needs to provide the requisite

support rather than seemingly leaving it up to the individual to apprise themselves of the relevant knowledge (sometimes after the event.

Research Objective 3

Formalising and integrating knowledge practices into the organisation could be of practical benefit, and the data suggests that it is accepted that the complex nature of policing mitigates the practicality of a "one size fits all" knowledge solution (Gottschalk, Holgersson and Karlsen,2009), however, whilst knowledge is a stalwart part of the function of the organisation, it does not appear to be managed comprehensively or cohesively.

Integrating knowledge practices may also lead to the exploitation of new opportunities for the organisation. It also appears that formal training or educational processes in the organisation do not include knowledge as part of the curriculum, and this is something that could be addressed. It would seem that there are knowledge gaps in the organisation, and they manifest as deficits in service delivery and potential loss of knowledge through lack of succession planning, unstructured knowledge dissemination, and sporadic re-deployment of personnel. It is suggested that these gaps could be addressed in terms of knowledge loss, potential lack of professionalism, and compromised service delivery that can accrue from same.

Knowledge hoarding has been mentioned in the data; however, it is a more complex phenomenon than simply withholding knowledge. The reasons for knowledge hoarding have been documented in this research (Laihonen and Mäntylä, 2017), and they include individuals reluctance to share knowledge because they may be "targeted" for the knowledge, they may be moved to sections that they do not want to work in, and individuals may defer to them and not utilise their own knowledge and skills which places a greater responsibility on the knowledge holder. It is suggested that knowledge holders need to be identified, trained, and

potentially rewarded for their skills and abilities; however, it also appears that knowledge holders are not necessarily the most suited for certain roles, and this also must be addressed. The organisation does not appear to treat knowledge as a business tool, and as a result there is a lot of individual knowledge available in the organisation that does not appear to be ratified or made part of policy. Tacit knowledge does not seem to be capitalised on and individuals experience, qualifications, and knowledge appear to be exploited on a "localised" basis, but there does not appear to be any policy in effect that attempts to make this knowledge available to the organisation.

It is suggested in the data that more engagement with the community could increase knowledge sharing and dissemination (Hough, 2010). However, levels of discretion appear to be reduced, given the comprehensive volume of oversight and oversight bodies in existence. This appears to be causing a dichotomous tension in front line police officers between the necessity to engage with people in a discretionary way and the necessity to implement stringent legislative and governance policy.

There does not appear to be a cohesive documentation policy in the organisation to capture knowledge and learning and inculcate this into effective training processes. Knowledge is an essential tool in decision-making, and it does not appear to be disseminated as well as it should be to frontline police officers who have to make very quick decisions in a lot of cases. This is also suggestive of a lack of proper support from management, which could indicate that the policies driving training and education need to be more effective.

Innovation does not appear to be encouraged, and this is potentially due to the myriad oversight and governance and the disparate policies that emanate from these various sections. The data suggests that because of the erosion in discretion as a result of this, frontline police officers are hesitant to be innovative and utilise discretionary judgement.

The data suggests that policing may need to move away from being judged only on crime statistics; rather it should be judged on a range of social policy and community engagement initiatives (Hough, 2010). The data also indicates that there is not enough focus on these issues, and these could be commensurate with increases in morale and public engagement.

There appears to be uncertainty and potential dissonance between civilian and police staff in certain areas and in certain administrative roles. Unified training and more comprehensive communication could be helpful in addressing these issues.

Summary

Overall, this organisation is typical of a modern police force, albeit one that polices by consent, in that it has the will of the people in a lot of areas that allow it to interpret and enforce legislation, observe and interact with the community, and promote societal harmony.

However, with regard to knowledge, there are areas where the organisation appears to be the victim of its own complexity. The brokering of individual knowledge "silos" appears more to be an answer to a lack of knowledge practices than just a mere "hobby" for individuals who are particularly interested in certain areas. The Tacit knowledge generation does exist, but it appears to be on an individual basis, and not shared, and as a result, knowledge practices do not appear to be transferred via policy and process, rather on a sub-optimal basis. It would seem that there are issues around succession planning and knowledge hoarding, but this is perhaps related to a lack of support and coherence around knowledge practice. There is clear

dissemination of knowledge, but again, it appears to be on an unstructured basis, and deployment of personnel is somewhat reactive rather than proactive. The clearest areas of demarcation in terms of communication appear to be borne of public sector hierarchical constructs rather than knowledge practice, and knowledge practice happens as a result of these, somewhat symbiotically.

Training also appears to be somewhat disparate and does not appear to cater to knowledge and experience, more specifically, the utilisation of this knowledge and experience. Rather it seems to be completely focused on explicit legislative and procedural paradigms which do not account for tacit knowledge, discretion, somatic or discursive knowledge, and experience. Discretion is a recognised part of police work, however; it appears to be eroded by legislation pertaining to data protection, oversight, governance, and lack of coherent strategies around these.

The value of knowledge is extremely complex and the "remit" of knowledge holders equally complex, considering they may not wish to share their knowledge, or they may feel that it would preclude them from being deployed in certain locations. The data also points to an "entitlement" to knowledge in order to carry out policing effectively. Knowledge assessment practices are not carried out in the organisation, and this makes any attempt to assess the efficacy of existing knowledge difficult. Experiential knowledge does play a role in policing but in this particular case it is not situated accurately or within broader policy constructs.

The organisation does not appear to value knowledge and knowledge ability, rather it takes its mandate from specific policies in relation to governance and political influence. There also seems to be specific "gaps" between knowledge that is needed at the frontline of policing and the availability of that knowledge. This has the potential to lead to a level of vulnerability in

front line police officers and potential compromise of members of the public in certain situations.

Knowledge also has the potential to be employed in a monetary context insofar as it can be utilised to examine the potential costs of resources versus the probability of crime-solving. This possibly means that knowledge can be used to refuse a police presence purely on the basis of a lack of resources or budgetary concerns. There is also an onus on the organisation to provide the requisite support for individuals vis a vis individual knowledge, as there appears to be a significant amount of individual knowledge learning at the frontline where people feel they are left to "fend for themselves."

The use of statistics is very relevant to policing, however, this does not reflect the value of the tacit knowledge or experience built up by a real-world police officer, and this is where training needs to potentially change; tacit knowledge needs to form a more important and relevant part of policing and police training. Formalising policing roles and integrating knowledge into both training and ongoing professional development may be a practical step and may also lead to new opportunities for the organisation in terms of innovative practice and training delivery.

The data suggests that the organisation does not appear to treat knowledge as a business tool, and it gives rise to siloism, which needs to be managed because the knowledge gained may not be ratified. Innovation does not appear to be encouraged, and this may be due (in part) to the myriad of governance and accountability, and the disparate practices and policies that they engage in. Because of the reduction in discretion, front line police officers are hesitant to be innovative and make discretionary judgement. There appears to be a "tension" between civilian or support staff and police staff in certain sections and in certain situations, and this needs to be addressed by more coherent communication and inclusive training.

5.13 Thematic Analysis

The themes that have been developed from the data indicate what has been found through a rigorous process of coding. Using An Garda Síochána as a case study, the data indicate that knowledge is recognised as a substantial contributor to change in today's policing environment, but its potential is as yet, not manifest in policy or practice. For example, there is some procedural support for knowledge (in the existence of the analysis service, for instance), but it does not appear to be structured or contextualised.

The complex mandate of both the public sector and policing combined represents a substantial contributor to the knowledge landscape as it imbues complexity to the decision-making processes of front-line policing and management's ability to deliver practical policy through effective knowledge dissemination. Knowledge "value" in policing as discussed by Nordin et al. is primarily about context (Nordin, Pauleen and Gorman, 2009a), and if this context is constantly evolving, then practical knowledge policy must also be malleable.

However, this means further knowledge integration, and this is a complex issue as there is no substantial or co-ordinated support for knowledge. The themes developed also suggest that the existence of knowledge champions has occurred as a direct response to the lack of formal policy on knowledge and knowledge co-ordination.

In relation to knowledge "entitlement" as it pertains to this research, there is a suggestion that there is a lack of clarity around knowledge and exactly what is needed for front line police officers to make quick decisions when dealing with situations. As suggested by Richardsen et al. the public expects police officers to be knowledge stalwarts, and this includes both the ability to interpret legislation effectively but also to have practical knowledge of policy and procedure (Vickers and Kouzmin, 2001; Richardsen, Burke and Martinussen, 2006).

However, this knowledge is not always available or transferred effectively through practical and cohesive training, which means that service delivery can be affected.

There also seems to be a need for clarity around processes, a view echoed by Murray (Murray, 1987), and this is also manifest in the data in that a lack of clarity has led to a reduction in innovative practice and an erosion in discretion, as police officers are unsure of the scope of their remit in certain situations; moreover, they are often unable to make practical decisions on the spot and have to resort to reference at a later time in order make legislative and procedural judgements.

The themes around knowledge and policing suggest that the traditional view of policing (the protection of life and property, and the prevention and detection of crime), (Seba and Rowley, 2010) do not seem to underpinned by cohesive and constructive knowledge paradigms, and the realisation that this is not the only facet of knowledge in relation to policing (Dean, Filstad and Gottschalk, 2006; Pee and Kankanhalli, 2015).

The themes adduced also suggest that overly governed policing is not conducive to knowledge sharing and, ironically it would seem, has the opposite effect to that which is intended, i.e. they purport to bring clarity and accountability to policing; however, they seem to bring complexity, overlap and over accountability, to the extent, that police officers are reluctant to make decisions in certain cases, because of potential consequence.

Succession planning (as it relates to knowledge) is also a key issue (Liebowitz, 2008)as the opportunities for knowledge transfer are mitigated. In the case of An Garda Síochána, there has been a unique reason for this (due to the moratorium on recruitment in the past ten to fifteen years); however, this only points to the value of succession planning and it's remit to have knowledge handover in order to ensure continuity, particularly in policing.

Training is a complex issue and one that requires clarity, as it appears to be delivered through a "one size fits all" process. This has the potential effect of frontline police officers knowing a proportion of a vast remit and not, however, a substantial portion of any one area. This is clearly linked to role specificity and the practical benefits that can accrue from having specified roles and commensurate training delivered for each, which can result in high degrees of specialisation, and professionalism. Training, therefore, needs to be conducted in contextually specific ways that, for example, tailored to individual sections, areas, or directorates within the organisation.

Another benefit of a successful knowledge initiative is the inclusion or inculcation of context specific knowledge, (Zheng, Yang and McLean, 2010), which can assist in police officers benefitting from relevant knowledge, particularly in situations where information needs to be forthcoming to inform instant decision making, such as dealing with potential legal infarction and applying / interpreting a viable legal context to a given situation.

The main themes adduced from the data are detailed in Table 26 (overleaf)

Table 26 Thematic Analysis

		Knowledge	Practices	Information /Technology	Resources	Training /Education	Miscellaneous
of RQ	**RQ** / **What is the role and contribution of knowledge and knowledge management practices in policing by consent. The case of An Garda Síochána.**						
	Themes						
RO1	*To critically evaluate the role of knowledge and knowledge management in policing.*	• Loss of knowledge. • Lack of Planning. • Access to knowledge. • Isolated knowledge. • Ad-hoc knowledge. • Knowledge champions. • Siloed knowledge.	• Unnecessarily complex. • Uncertain. • Unclear handover. • Lack of succession planning • Paperwork.	• More reciprocity. • In line with best practice. • Utilised comprehensively. • Security.	• Not allocated for knowledge. • Polices by "consent".	• Complex. • Requires clarity. • Role specificity • No standardisation of knowledge practices.	• Complex Mandate. • Overly governed. • Lack of support.
RO2	*To assess the value of knowledge and knowledge management practices in policing*	• Knowledge structures add value (legislation, policy). • Experiential knowledge critical. • Discretion essential but not valued.	• Governance (overly complex), and not adding value. • Discretion being eroded.	• Adds value but has an uncertain structure.	• Knowledge support for front-line police officers is not structured, and its present value is questionable.	• Training comprehensive but reactionary and is not adding as much value as it should.	• Knowledge not valued. • Decision making needs to go up and down the organisation.
RO3	*To offer guidance to police forces in similar size countries relation to knowledge and knowledge management practices.*	Knowledge is an "entitlement". Knowledge cannot be valued if it cannot be assessed. • Discretionary and experiential knowledge. needs to be recognised. • Knowledge needs to be shared. • Siloed knowledge needs to be addressed. • Knowledge loss needs to be addressed	Knowledge needs to be integrated with practice and policy. • Shadowing personnel before they retire, or transfer needs to be considered. • Knowledge measurement processes need to be enacted.	• Needs to be supported and resources allocated accordingly.	• Resources need to be made available for context specific knowledge support.	• Tailored Training	Standards need to be clarified. Innovation needs to be encouraged. • Communication channels need to be enhanced to reduce uncertainty. • The perceived "gap" between civilian and police employees needs to be addressed.

Figure 25 Thematic Analysis Schematic (Overleaf)
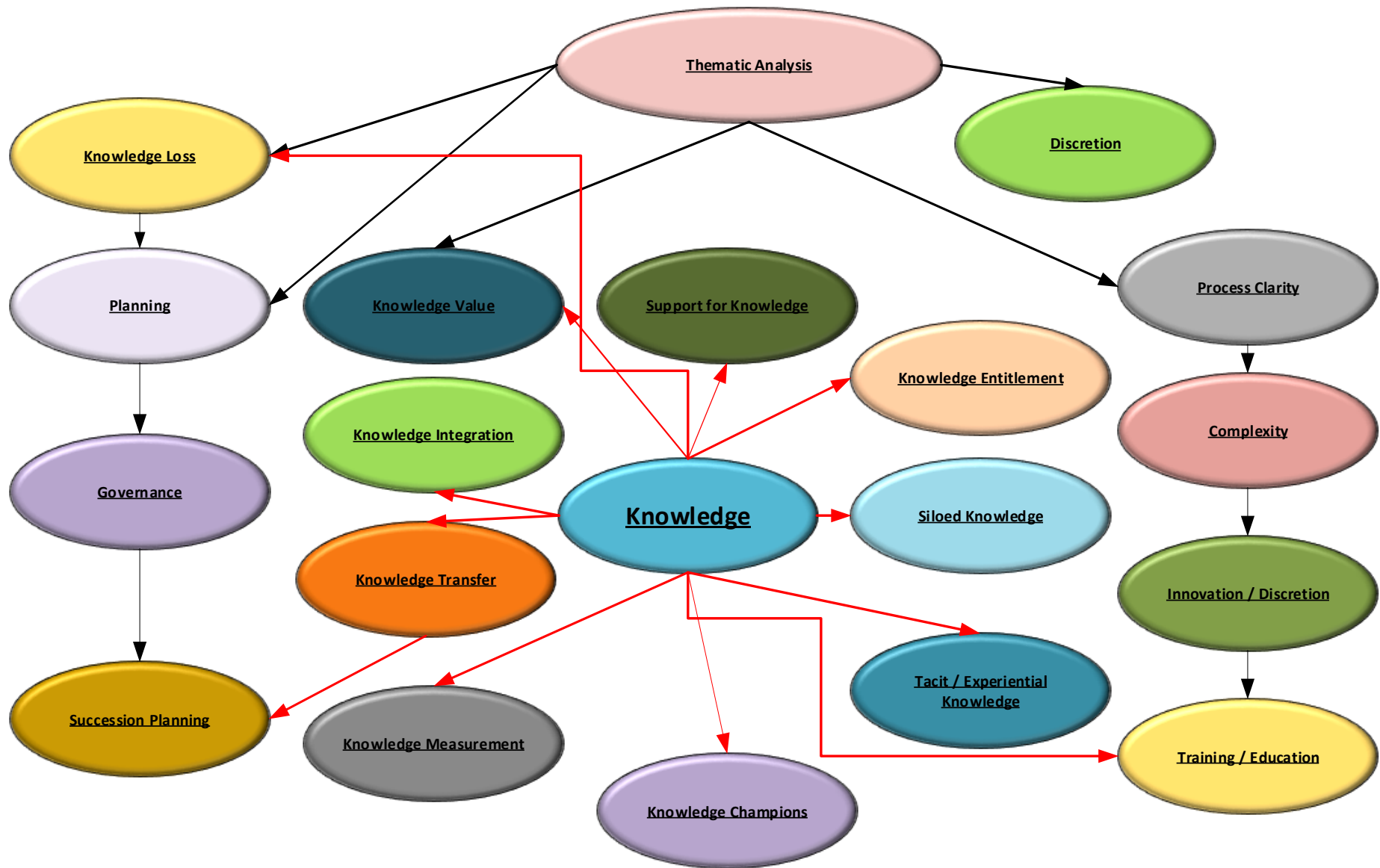
5.14 Conclusion

Analysis of the data in relation to policing has illustrated deep insights into how a modern police service functions. The research objectives have imbued the analysis with direction and the rigorous approach has allowed specific issues to be unearthed, which will be presented in this chapter.

In relation to research objective 1, it is clear that knowledge and knowledge management have an integral role to play in policing; however, this role appears to be complex and cannot be looked at as a singularity. For example, knowledge by itself will not enhance policing functionality unless it is accompanied by improved communication, specific training policies, and clear recognition that knowledge needs to be "passed on" to incoming personnel.

It is also evident that knowledge practices enhance decision making in policing, but it is equally evident that decision making can be greatly enhanced by salient knowledge being available when required, particularly on the front line.

In relation to research objective 2, it is evident that knowledge adds value to policing, particularly in terms of experiential knowledge and in areas of social engagement with the public. Specific areas such as community policing for example, need to be enhanced to maximise the value of experiential knowledge and the reciprocal knowledge that can accrue from information gathering. This can only be harvested if the environment is conducive to this, and thus the knowledge gained can be invaluable in the prevention and investigation of crime.

Knowledge management practices are very much in evidence but seem to be at worst, disparate, and at best, compartmentalised. This is particularly true of training, which appears to be reactive and not proactive. In some cases, this has led to "siloed" knowledge practices flourishing and this in turn to a lack of knowledge sharing, which is not conducive to cohesive knowledge practices. Thus, research objective 2 has a dual result, one to suggest that the value of knowledge management in policing is understood, however, not widely implemented, and two, to suggest that that the disparate practices in relation to knowledge can be attributed to a lack of cohesion and an attempt to bridge the gaps that these practices have enabled.

On the issue of governance, the data clearly indicates that the amount of governance and oversight is having a negative effect rather than the positive one which is intended. Policing has to be governed; however, the extent of this governance and the knowledge that it imparts is, the data suggests, tenuous at best and onerous at worst.

In relation to research objective 3, the recommendations would clearly be oriented around knowledge cohesion, siloed, experiential, tacit knowledge, and knowledge integration. The knowledge "gaps" that the data has uncovered include "front-line" knowledge, knowledge "entitlement", knowledge complexity, knowledge silos, and the issues around same which have been documented.

The current state of knowledge and knowledge management in policing is as complex as the mandate through which it operates. For the future, cohesion, clarity, and purpose will all be needed in order to engender knowledge practices from cohesive policy creation and "buy-in" from those for whom the knowledge is intended to assist.

Chapter 6 Conclusions and Recommendations

6.1 Introduction

Analysing the current state of knowledge and knowledge management in policing is not an easy task, given the myriad ways in which knowledge can be inculcated not only into business practices and processes, but also into organisational fabric itself. Knowledge has the propensity to become not only a powerful organisational asset and communication solution, but also a transactional and organisational "norm." An evidence-based knowledge management solution has the propensity to change the way in which an organisation operates, and it is not surprising that scholars the world over have lauded the concept of knowledge as a key organisational asset and one which can bestow competitive advantage if successfully harnessed (Chapter 2).

The idea of public sector knowledge management is a relatively new phenomenon, as is the idea of policing knowledge as a policing asset. Policing, law enforcement, and the knowledge ability that it demands, and that is demanded of it has been in evidence since the enlightenment era, but in today's world, it requires recognition as a global system of interrelated practices, policies, and procedures aimed to organise, manage, and normalize societal discord. It also assumes, at its core, intrinsic sociological theoretical foundations derived from a moral bias of social order (Bowling and Sheptycki, 2012).

By providing unique insights into policing knowledge management, this work will assist scholars in gaining an understanding of what has heretofore been a cloistered, insular section of the public sector. This is particularly important to the intrinsic workings of a modern police force, and to how knowledge and knowledge management can add value not only to day to day working, but strategic imperatives, policy formulation, and key decision-making

abilities. This work will also be of value to other policing institutions mandated to police, and police by consent, and who also seek to understand the role knowledge can play in a complex environment with an equally complex mandate.

AGS have indicated that they may incorporate the findings of this research into their modernisation and renewal programme. It has been suggested that this research will inform the basis of AGS's new knowledge strategy. This would allow for new levels of collaboration between the University and AGS, as progress on these initiatives will allow further research, which will engender a culture to support "evidence-based" strategy and policy in this domain.

6.2 Research Objectives

6.2.1 Research Objective 1

To Critically Evaluate the Role of Knowledge and Knowledge Management in Policing

The role of knowledge and knowledge management in policing is multifaceted. There appears to be a clear mandate for knowledge and a clear incentive for its effective provision; however, the role of knowledge in policing is as complicated as its remit. The types of knowledge needed for front-line policing, for example, is as varied as the specific personnel who have to deal with a myriad of issues on the street and in the community. The policing knowledge needed for this to be effective is a combination of tacit and experiential knowledge, procedural knowledge, and legislative knowledge.

The recognition, however, that knowledge adds value is not an assumption that it is *allowed* to add value. This research indicates that discretion in policing, (a fundamental antecedent to success in any criminal investigation) appears to be eroded by an increased amount of governance, oversight, and a necessity to conform to what is described as "best practice", not only nationally, but internationally. This, it is suggested, has led to confusion as to what constitutes best *knowledge* practice; for example, is it best practice to devolve knowledge to local management or to administer knowledge policy centrally? There is data to suggest that both approaches have merit, but there does not appear to be a consensus on what is the best way to devolve and administer knowledge decision making in policing.

Training

Knowledge is central to police training paradigms. However, due to the potentially large range of knowledge that policing demands from officers, training, by implication, seems to have become a contentious issue, and one that appears to be borne of reactive rather than pro-active stimuli (such as a recognition that role identification and delineation may need to be specified before relevant training can be undertaken). In its present format, training, and knowledge, while synonymous in a policing context, may have the propensity to bestow what this research suggests are levels of uncertainty and complexity on police officers.

This stems from what appears to a reticence regarding the realisation of the broad remit of a police officer versus a desire by management to present to stakeholders (including the public) a fully trained officer capable of dealing with a vast array of issues from social work, criminal investigation, effective legislative interpretation in potentially strenuous and stressful situations and under time constraint, and an ability to deal with ancillary situations such as security, static and dynamic security detail, crime scene analysis, effective restraint, pseudo paramedic requirements, and social counselling, which is, this research suggests, is an impossible task.

Knowledge Transfer and Sharing

Knowledge transfer and sharing are essential in a policing context, and they represent specific areas where knowledge gains can be made; however, succession planning does not appear to be practised in policing, and this is primarily due to cost. The cost of proper succession planning and "shadowing" does not appear to be budgeted for, nor does it seem to be an issue for future budgetary consideration.

Knowledge sharing appears to be carried out primarily on an informal basis, but it does not appear to be formalised, particularly in relation to expertise in various areas of legislation. The rise of knowledge champions in AGS seems to have occurred in response to a lack of official knowledge policy. Moreover, the knowledge experts appear to be centred around people with vast experience in specific types of legislation, such as road traffic offences. This may indicate that knowledge in these areas is not forthcoming in the organisation on a policy level and is potentially unavailable to front line members in a way that is easy to implement or interpret.

Knowledge Assessment

The value of policing knowledge cannot be discussed without some form of assessment practice in situ, and this research has found that there does not appear to be discernible knowledge assessment practices in existence (with the exception of normal crime detection statistics); however, these do not portray a picture of the overall effectiveness of policing. Some specifics around crime prevention, for example, while almost impossible to ascertain accurately, may be necessary in order to effect a comprehensive reflection of the overall effectiveness of police service. Therefore, an overarching knowledge assessment policy may need to take cognisance of community engagement, social policy, and human involvement.

Knowledge Processes

It would also seem that there needs to be clarity around processes, as modern policing demands effective knowledge, and knowledge that can be utilised at the front line in a short period of time, or instantaneously, in some situations. This is echoed in the data with senior management in AGS referring to the ideal of knowledge as a "business tool", but equally suggesting that it is not treated as such within the organisation.

Technology accounts for the single biggest cost in the organisation (after salary), and it is well supported; however, the data suggests that there appears to be knowledge gaps around issues of resourcing availability, relevant technology, and third party consultants and the knowledge that leaves the organisation when they depart.

In relation to research objective 1, it is clear that knowledge and knowledge management practices are in evidence in a policing environment. This is borne of necessity and design. However, they do not appear to be accounted for. They do not seem to be inculcated into organisational practice, and as a result their potential efficacy is reduced. The vast potential of knowledge and knowledge management practices when married to an environment as complex as policing invariably mean that not all knowledge will be relevant or required. However, the potential of knowledge and knowledge management practices to increase efficiency and effectiveness is greatly reduced if there are no viable knowledge assessment practices in place, nor recognition of their efficacy.

The existence of "knowledge champions" has, as mentioned, happened as a result of what appears to be a lack of inculcated knowledge (both tacit and explicit) within the organisation. Knowledge and knowledge management plays a significant role in policing, however, it seems its effectiveness is underrated, underused, and lacks formal methods of cohesion.

6.2.2 Research Objective 2

> **To assess the contribution of knowledge and knowledge management practices in policing**

In order to situate the role that knowledge and knowledge management can play in policing, it is necessary to adopt a two-fold approach. The first is to discern what knowledge and knowledge management practices are being used in today's policing environment. The second is to discuss what the potential for knowledge and knowledge management practices could be if they were orchestrated against a foundation of awareness, practical implementation, and cohesive policy development.

Knowledge management practices in policing have been discussed in chapters two and three, however; this research has discovered that in order to assess the value of knowledge and knowledge management in policing, one has to include elements of tacit, experiential, specialist, and explicit knowledge. These are made all the more complex when intertwined with governmental and societal mandate and a wide range of expectations, which can shift according to national, international, and even global demands (Abdullah and Date, 2009). Knowledge in particular, has to be available at the correct time and in the correct context, otherwise, police officers can be left in potentially contentious and possibly litigious situations.

This research has highlighted issues such as practices that appear to involve retrospective legislative corroboration of arrests, in some cases, after the detainee has been brought back to a police station and is being processed. This practice could place not only police officers but members of the public in a precarious situation and potentially expose a lack of knowledge that front line police officers, in particular, may need to have at their disposal when dealing with issues on the ground.

The practice of knowledge sharing does not appear to be evident in policing (in a formal manner particularly), (Griffiths *et al.*, 2016), which can place a burden on police officers who are operating in a duality, for example, with regard to a necessity for knowledge and uncertainty as to the formal procedures for obtaining it. This makes the existence of unverified tacit knowledge inevitable and what is then equally inevitable, the lack of organisational support for same.

Training is designed to impart knowledge, and the training process is comprehensive, however; it also appears to be contradictory insofar as its remit appears to be too broad. The value that it attempts to add to policing, i.e., grounding processes in appropriate knowledge bases, does not appear to be manifest at the front line. Equally, the disparate nature of policing makes it very difficult to encompass all potential requirements and demands made on a police officer in one general training process.

While the data indicates that police officers need access to a wide array of knowledge, the issue may be one of validating that knowledge in appropriate processes and procedures; hence, some knowledge processes require instigation and validation from the bottom up. These processes are not apparent, and due to existing public sector hierarchical practices, this approach is difficult to implement.

In order to critically evaluate the role of knowledge in policing, it is necessary to look closely at the measurement of crime. This is difficult insofar as measuring crime necessitates the measurement or the attempted measurement of crime prevention, discretionary policing, and tacit and experiential knowledge.

The data suggest that the measurement of crime appears to be moving away from discretion and inclusion of experiential knowledge and more towards procedural and process-based statistical analysis. For example, the suggestion that going forward, policing can be financially evaluated in terms of its propensity to deliver value for money, and the centralisation of resources which can potentially result in a loss of community based policing service, point to an increase in explicit accountable policy and process. This may have the capacity to reduce innovation, discretion, community engagement, and individual decision making even further.

In policing, knowledge has the propensity to deliver value in terms of increased communication, practical application of policy and legislation, and essential support mechanisms. However, taking what appears to be a lack of specific knowledge practices in place in the organisation, knowledge value does not appear to be maximised and presently does not appear to be part of policing strategy. Rather, there appears to be an emphasis on justification to a wide array of stakeholders that policing will do what it is mandated to do, protect life and property and prevent and detect crime. But the machinations of this are not evident insofar as coherent knowledge practice as a potential precursor and enabler of change is concerned.

6.2.3 Research Objective 3

> **To make recommendations to police management in relation to improvements in existing knowledge and knowledge management practices and to offer guidance to police forces) in relation to knowledge and knowledge management practices.**

It appears from the data that the existence of knowledge and knowledge practices are not enough to produce coherent knowledge processes, which, if existed, could assist in constructing practical support structures within the organisation. The key issue in developing coherent knowledge practices is the recognition of the divergent aspects of policing and the fact that one coherent knowledge practice or policy does not appear to be suitable for all.

It seems that the lack of overarching knowledge strategy is evident in the organisation; however, there is also the recognition that knowledge is a key enabler of communication and the lifeblood of policing service. At particular times, some more vital than at others, integrating knowledge and knowledge practices would be of discernible benefit to the organisation; however, this has to be commensurate with a potential overarching knowledge process that allows it to be tailored to various sections, various areas, and various locations.

This research has also highlighted that potential knowledge gaps are evident within the organisation and these appear to emanate from said lack of knowledge policy however; they manifest in service delivery gaps coupled with substantial knowledge loss from what appears to be a lack of coherent recruitment and succession planning policy.

The issue of siloed knowledge is a very real one for the organisation and the fact that it exists at all appears to have occurred, as mentioned, because of what presents as incoherent knowledge policy and practice. The fact that it exists also suggests that if it could be validated and proceduralised, siloed knowledge could be used as a foundation or starting point for cohesive knowledge policy and specific training paradigms.

Knowledge holders in the organisation occupy complex roles. Given that policing is itself a knowledge role, the fact that individual, self-championed knowledge holders exist is an issue that could be addressed by management, as this can lead to knowledge hoarding and the suggestion from the data that knowledge holders may be reluctant to share knowledge due to the possibility of redeployment or lack of recognition for knowledge sharing. The issue of knowledge holders must also be addressed in terms of others abdicating responsibility to them and not employing their own skills and experience to issues in deference to what they perceive as the "experts" in specific areas.

The lineage of policing suggests that it has a strong cultural heritage, and this can act as a deterrent to knowledge sharing, as new proposals and ideas or communication strategies have to be posited against a backdrop of existing cultural paradigms. This is particularly true in the public sector, given the lifelong "tenure" policies in existence. Culture (including, for example issues such as tenure, knowledge hoarding, and knowledge sharing) need to be addressed in order to allow knowledge practices to be accepted within the organisation.

The concept of greater levels of policing integration into the community has the potential to increase knowledge sharing and knowledge dissemination. This also has the potential to increase communication between the public and the police and can result in the provision of vital information with regard to criminal investigation. However, there appears to be an erosion of the levels of engagement between policing and the public due to increased centralisation of resources, a reduction in the levels of discretion afforded to policing personnel, and an increased reliance on and abdication to, stringent legislative and governance policy.

In relation to the applicability of these findings to other police forces, in terms of their propensity to add value, and by way of example, the police force of New Zealand polices by consent, has a personnel strength comparable to AGS, (12,000 as compared to 14,000) and in the context of their "Performance Improvement Framework" (police.govt.nz), they cite similar issues in relation to knowledge and communication. In a study completed by Griffiths et al. in 2016, it was concluded that knowledge management in police forces throughout Europe is comprised of disparate practices borne of dissimilar knowledge sharing and dissemination processes (Griffiths *et al.*, 2016).

This would suggest a commonality of issues around knowledge and knowledge practice in policing borne principally of a lack of awareness of the benefits of it (Denner and Blackman, 2013). Caparini suggests that that police forces preparing their personnel for front line deployment overseas need to establish "a more systematic and deliberate means of capturing, applying and sharing knowledge within the organisation" (Caparini and Osland, 2017). Lindsay et al, suggests that sharing knowledge is crucial for effective law enforcement (Lindsay, Cooke and Jackson, 2009), and Seba and Rowley suggest that implicit knowledge in policing should be fostered through training and mentoring (Seba, Rowley and Delbridge, 2012).

As the literature suggests, in relation to policing knowledge, various entreatments to knowledge, the lack of same, and its potential benefits have been brokered. However, what this serves to indicate is that in regards to policing, there is a consensus that knowledge paradigms are a complex and coherent set of aspirational suggestions, nothing more. This work puts forward specific knowledge suggestions born of data generation from inside a modern police force and as a result of a rigorous analysis process that highlights knowledge practice (both current and potential). This will have relevance to other, median level police forces, which can then adduce knowledge findings and recommendations in this work in order to evaluate their own knowledge and knowledge management paradigms, and utilise the results as a starting point for knowledge policy implementation.

6.3 Findings

This leads ultimately, to the key findings of this research, and they are presented under the following headings.

Policing Organisational Governance and Policy

Oversight

1. Oversight and governance appear to have had the effect of reducing discretion and innovative practice. Public sector accountability is a necessary phenomenon in order to ensure that service providers give value for money (Nutt, 2006; Massingham and Massingham, 2014a); however, it is also a necessary part of policing (Filstad and Gottschalk, 2010), and is part of most policing organisational processes, (see Chapter 3.11). AGS however, appears to have a large degree of oversight with five distinct bodies in operation to monitor performance, accountability, and inform mandate. The data indicates that the cumulative effect of this appears to be contrary to what the oversight bodies themselves purport to achieve (Table 20, lines 2 +3, table 23, line 1, Appendices V2, A.1, A.8, A.25, A.35, A.50, A.65, A.107). In relation to the effects of oversight, it also appears that the provision of same has not led to any discernible change in crime statistics (see figure 13).

Policing Organisational Management

Standardisation of knowledge

1. There does not appear to be standardised knowledge practices in the organisation and even within sections (Table 18, Line 2, Table 23, Lines 12 and 14, Appendix V2; A,9), and this is an issue evidenced in other police forces, with the Australian Federal Police focusing on future knowledge sharing practices, https://www.afp.gov.au   and the Royal Canadian Mounted Police (RCMP) http://www.rcmp-grc.gc.ca, discussing standardising intelligence gathering in order to increase effectiveness. The literature also calls for knowledge regulation, with Heisig, for example, alluding to the practicality of standardising a knowledge framework (Heisig, 2009), to increase organisational effectiveness.

2. This lack of knowledge standardisation also seems to be evident in what appears to be a shortage of knowledge repositories in the organisation, which, if existed, could be available to frontline staff if required Appendix V2; A.65 , Table 25, RQ1. This also has a direct input into the existence of knowledge holders and champions who have come to the fore as a result of a lack of sufficient knowledge and knowledge availability. The literature echoes this suggestion, with Senge, for example, recommending that access to knowledge is key in relation to the propagation of an organisation learning paradigm (Senge, 1997).

Knowledge Transfer and Dissemination

1. It would seem from the data that knowledge dissemination in An Garda Síochána is unstructured, and this appears to have led to gaps in knowledge practice and processes. This may partly be due to the recent moratorium on recruitment, which has led to difficulties in succession planning; equally however, there does not appear to be coherence around succession planning (Table 25, Table 23, lines 7 & 13, Appendix V2; A.47, A73,). The literature suggests that capturing knowledge in a policing environment is difficult (Filstad and Gottschalk, 2010), and other police forces generally find it difficult to capture knowledge before existing staff leave (Hu, 2010). Knowledge transfer, however, is crucially important, with the median experience level in some Irish police stations being of the order of two to three years service (Interview 25, JCMD) as the experienced staff have transferred, resigned or retired, and their knowledge has not been passed on (Interview 25, JMCD). It would also seem that this has led to a lack of knowledge capture, (Interview 17, ACL), which, cyclically, feeds back into a potential lack of knowledge availability in the organisation.

Knowledge Measurement

1. It would appear from the data that there does not seem to be specific knowledge measurement practices in place in the organisation. In the public sector, knowledge is seen as a flow process and one that should derive specific value for the information gained, which, in a policing context, should result in a measurable outcome, i.e., the detection of crime (Gottschalk, 2006a). However, equally in a policing context, there are two distinct intangible parameters at work; one is the relatively indefinable nature of knowledge itself (Davenport, Prusak and Webber, no date), and two, the intangible measurable element that is the prevention of crime (Barton and Valero-Silva, 2013). Combined, these make policing knowledge measurement extremely difficult, especially when also set against shifting societal and governmental mandate.

2. In the case of An Garda Síochána, the data suggests that knowledge needs to be measured (Appendix V2; A.53, A.50, A.12), as current practice would suggest that it is not structured and leads to a lack of awareness of its potential benefits CE Interview 5), (BMCP Interview 18), (DCT Interview 15). It is accepted that it is difficult to measure knowledge in terms of policing, specifically in relation to crime and its effect (HMICFRS, 2018), and indeed its prevention; however, increases in knowledge awareness have led to proposals for "shadowing" (Table 25), (Table 23, Line 15), and "costing" both of which are under discussion at present (Interview 9. MC).

Knowledge integration

1. There appears to be a lack of integration of knowledge between civilian and police staff, which seems to have given rise to issues around knowledge sharing and reciprocity, Table 23, lines 2 &3, and 4, 5 & 8 -11), Interview 2 LW. This potential lack of knowledge integration has also contributed to the existence of "siloed" knowledge and individual knowledge champions, and this knowledge does not appear to have been harvested or standardized. If this was to occur, it could potentially be fed back into decision-making points in the organisation (Table 25, Table 20, lines 4, 8+10, Table 23, Line 10, Appendix A 88), Interview 22, CM.

Individual and Front line Policing

Access to Knowledge

1. This research has found that one of the biggest issues in AGS for front line police officers is access to knowledge. This is a complex phenomenon and one which can be made more complex if a distinction is to be made between the knowledge available to in individual and the requisite time to evaluate it effectively (Hayek, 1945). This is particularly true in front line policing, where time is a crucial component in effective knowledge dissemination. Access to knowledge is not a new phenomenon, however, (Andreeva and Kianto, 2012c), nor are the issues of how to interpret and utilise it correctly (Veenswijk, 2006); however, the data has indicated that knowledge in AGS does not seem to be readily accessible in certain areas, (Table 20, Line 6, Appendix V2; A2, A65, Table 25, RO1). Access to knowledge has also led to what appears to be a tenuous process of ensuring and validating legislation to corroborate a power of arrest after the arrest has taken place (Interview 25 JMCD).

Individual Knowledge

1. The data suggests that there does not appear to be definitive policies in place to capitalise, harvest, or inculcate the knowledge that individuals possess either from training or relevant experience in a policing environment, or to identify those with knowledge or experience Appendix V2; A.4, A51,A73, A96, and this is crucial if the relevance of organisational knowledge is to be capitalized on (Ray and Clegg, 2005). In a policing context, individual knowledge is derived from information gained, and then exchanged for more information, (Dean and Gottschalk, 2007), and the result is a symbiotic increase in

knowledge awareness and knowledge exploitation, both to capitalise on investigative results and to promote crime prevention is to capitalise on individual knowledge (Barton and Valero-Silva, 2013).

2. Placing the individual at the core of policing knowledge enables a variety of possibilities, including, as mentioned, the potential to harvest and maximise knowledge benefit (Table 20, Lines 5 & 8, Table 21, Line 1, Table 23, Line 11, Table 24, Line 2).

3. It must also be stated however, that individual knowledge has led to the existence of individual knowledge holders (as mentioned), and this is a complex phenomenon that lends itself to a variety of possible outcomes, including (as discussed), training, knowledge measurement, and access to knowledge, (Appendix V2, A.89, A.11, A.16, A.24, A.48, A.58, A.72. A.78).

Technology

1. Technology as a key enabler of organisational change must be situated in context, as it has a complex role to play in knowledge and knowledge management. It is essentially linked to the codification of knowledge, which indicates its inability to capture its tacit, somatic, and discursive elements (Cleveland AB, 1999; Roberts, 2015). However, its ability to store and process information is beyond question, and it is essential that it is utilised to best effect in order to make specific knowledge available to front line police officers when required (Moffett, McAdam and Parkinson, 2003). Crime analytics and statistics notwithstanding (Glomseth, Gottschalk and Solli-Sæther, 2007), knowledge re legislative interpretation, key support issues, and timely intervention is required for front line police officers.

2. The data suggests that technology is apparent in the organisation, but not cohesive and may require upgrading (appendix V2; A.31). There are also suggestions that the organisation needs to move closer to being technology-led, (appendix V2; A.56, Interviews 13 & 9). There are also specific links mentioned between knowledge and technology, with for example, policing managers citing knowledge loss through the use of contractual IT consultants (Interview 12) and front-line police supervisors suggesting that the technology is not effectively utilised (Interview 2). The data also suggests that ongoing investment in technology is something that needs to be addressed.

Training

1. The knowledge required to initiate and inculcate effective training paradigms in policing is complex and multifaceted (Caparini and Osland, 2017). The recognition of same in a policing context is also key in differentiating between training and education (Alegre, P. 'Police Education'), and a key issue for police training is that it delivers support as well as instruction (Barton and Valero-Silva, 2013). In relation to An Garda Síochána, the data suggest that training is extremely complex and does not appear to cater to core areas that are (in some cases) necessary for effective front-line policing (Table 23 Line 14, Appendix V2; A.35, A37, A110, A112). Training also appears to be an emotive issue (Interview 26 SK), and one which is intrinsically linked to the existence of individual knowledge champions in the organisation, as existing training practices are seen by some front-line staff as incomplete or inadequate.

6.4 Recommendations

Introduction

Adopting a pragmatic approach to this work has afforded the results a rigour that perhaps would not otherwise occur if a completely unbiased world view had been taken. The degree of experience of the researcher has allowed the research to capitalise on the data from an opportunistic standpoint and remain grounded through a rigorous methodological oversight process from the beginning of this work through to its conclusion.

If real-world experience has the propensity to generate theory than it could be concluded that a level of generalisability has the propensity to moderate efficacy. And in this case, An Garda Síochána represents a median level police force that polices by consent and exhibits traits and characteristics that are exhibited in a wide array of policing organisations. For example, complex mandate, legislative imperative and interpretation, community engagement and crime prevention and detection.

This work has distilled the complexity and specificity of policing knowledge into a coherent set of findings and through this, a specific set of recommendations that are applicable not only to An Garda Síochána, but other median level police forces. These are suggestions on how best to maximise and effectively utilise knowledge practices and knowledge management and offer management guidelines on the most efficient ways in which to utilise what is, in today's policing environment, a vastly underutilised asset.

The ultimate goal of this work is to evaluate the role and contribution of knowledge and knowledge management practices in policing, using An Garda Síochána as a case study. Therefore, the following recommendations (with specific sub-paragraphs), are made as a result of this work;

Knowledge is a core organisational asset and must be overtly recognised and signposted as such. The appointment of a Chief Knowledge Officer (reporting to the Garda Commissioner) to provide policing governance and policy management will facilitate knowledge creation, knowledge management, and knowledge best practice. Ideally, this person will have had front-line policing experience at some point in their career. The office of a Chief Knowledge Officer is not a new phenomenon, and as detailed in chapter two, they are in some organisations seen as a positive step towards codifying knowledge effectively (Jain, 2009). However, in the context of an overarching solution regarding the issues raised in this research, the appointment of a Chief Knowledge Officer would be essential, and as a coordinating instrument, the office of Chief Knowledge Officer could essentially be tasked with ensuring the following knowledge recommendations are put in place;

The rationale for the appointment of a CKO has a basis in the fundamental contentions contained in this research. Knowledge in policing is essential. It is complex, varied, and has the potential to change the way policing works. The literature has clearly indicated a lack of research in this area however; it is also acknowledge that police work is based on knowledge. To co-ordinate and maximise the benefit of this attribute is therefore, essential. This research has also clearly indicated that a lack of knowledge in policing can lead to a palpable level of exposure, both for the police and the public. Therefore, knowledge needs to be available, co-ordinated, and managed. The recognition of this will be underpinned by the appointment

of a CKO at board level who is involved in championing knowledge and ensuring it is inculcated at all levels in a practical and coherent manner.

Knowledge needs to recognised as a value proposition and intrinsically linked with strategy and strategic imperatives in order to be effective and capitalise on its potential. This will ensure that going forward policing is viewed from a knowledge based perspective. For example, front line police officers should have timely and requisite knowledge at their fingertips including the ability (through technology) to link in with the Courts and Penal services to immediately ascertain the status of an individual or individuals vis a vis current outstanding penalties, or incarceration orders. For management, knowledge needs to be recognized as a strategic aid insofar as it pertains to the rationalisation of assets and practical communication benefits. The citing of knowledge as a value proposition is valueless unless it is utilised. This could include, for example, strategic policy around individual knowledge and the recognition and formalization of it.

Individual knowledge needs to be recognised and nurtured. It is suggested that specific processes are put in place by the office of the CKO to capitalise on individual knowledge and to support individual knowledge holders who can feel free to share their knowledge without fear of being isolated, re-deployed, or over-stretched by demands on their expertise. Moreover, the recognition of police personnel as knowledge workers only goes so far in terms of identification of their capabilities. This knowledge must be channelled, (for instance in the case of specific experts on law, procedure, criminal investigation techniques, social interaction, and community policing), into effective policy that is disseminated to all ranks in the organisation. Effective communication needs to be linked with training for all levels so that training is relevant. For example, it is contended that dissemination legislation to the

police personnel is not enough on its own, unless it is followed up with requisite training to ensure it is understood and its potential implementation analysed.

Knowledge practices need to be inculcated into policing culture such as knowledge sharing, knowledge dissemination, and knowledge reciprocity. This can only occur if the environment is conducive to such practices, and the culture is addressed in order for it to take place. This means encouraging police officers to share their knowledge, allowing this knowledge to be disseminated, and communicating the results of knowledge decisions (in the form of HR directives and bulletins, for example), effectively. This is primarily a specific role for the CKO and the resource unit, which would essentially be tasked with implementing a follow-up policy to ensure that knowledge is shared and inculcated. For example, shadowing (making specific time for personnel in new roles to learn from the incumbent) needs to be formalized in order that sufficient time is allocated to effective knowledge handover. Shadowing is relevant at all levels of the organisation in terms of its potential to ensure effective knowledge handover.

One of the key duties of the CKO would be to address the remit of governance and governance bodies. The effect that governance appears to be having on policing does not appear to be the one that it purports to have, which is to streamline policing and make it more transparent. Frontline police officers in particular, are reticent in using discretion, innovating, and interpreting legislative practice for fear of falling foul of governance procedures and governance bodies. This makes knowledge sharing and knowledge transfer more difficult and less likely to occur. Governance bodies may need to be amalgamated into one coherent and cohesive policy formulating body that has the interests of not just the public but of the policing cohort, which it is there to guide and protect. From a practice perspective, governance needs to be addressed as it is affecting all levels of the organisation in terms of its

complexity. For example, it is resulting in reticence at the front line for fear of recrimination and at managerial levels in terms of protracted reporting and decision making.

The organisation needs to initiate more communicative and inclusive knowledge practices around its various cohorts and reduce the perceived demarcation lines between police and civilian members. Cohesive communicative practices and lucidity of purpose in relation to knowledge dissemination needs to be inculcated at all levels throughout the organisation. For example, moves towards renaming all cohorts as one could assist in reducing demarcation, and cohesive representation from representative bodies could also assist in mitigating this phenomenon at all levels.

Knowledge solutions and knowledge practices must be recognised as not only viable when they emanate from higher echelons. Cognisance must be taken of the experience and practical input into knowledge practices that emanate from all ranks. This research has shown that a lot of viable knowledge practices have emanated from key frontline police officers (such as rolling checkpoints and ANPR), and who are not just dealing with the public daily but with situations concerning legislative practice and interpretation, court services, community engagement, and social interaction. It is crucial that their knowledge is recognised and fed back into decision-making points throughout the organisation. This recommendation is primarily the remit of the CKO and resource unit, who could initiate knowledge bases throughout the organisation at all requisite levels. For example, this research has clearly demonstrated disparity between central and local management. Thus, the role of the CKO and Resource Unit would be to manage and mitigate this via practical and coherent knowledge based communication.

It is also essential that this knowledge is seen as value-adding knowledge. For example, knowledge that some policy and practices may not be suitable for front line implementation, or the suggestion that outsourcing does not function effectively in certain circum stances, or that there is a discernible lack of policy around certain procedures in sexual assault cases all need to be channelled effectively and acted upon before being committed to policy. Knowledge needs to be recognised as adding value rather than for its own sake. Thus, the rationalisation of training, for example, based on compartmentalised function is a recognition that it is impossible to equip any one police officer with the myriad of potential knowledge required for all facets of policing.

Technology (ICT) must be leveraged throughout the organisation to provide front-line staff with timely and appropriate knowledge and insights. This, linked with effective training process, will, it is submitted, empower front line staff to perform key boundary- spanning roles that interact with key stakeholders.

Technology has a key role to play in policing, and the data from this research has indicated that it needs to be compartmentalised. The systems in place are complex and do not necessarily cater to (for example) front line policing. They are not amalgamated and properly integrated with ancillary systems such as the courts and penal systems. There is substantial investment in technology; however, according to the data, it is not cohesive and subject to a complex web of vendor's service level agreements and outsourcing organisations. This needs to be amalgamated and made relevant in order to provide relevant knowledge to those who need it.

Technology needs to be effective in order to be utilised as an active conduit for knowledge and knowledge dissemination. Technology accounts for the single biggest cost in the organisation (next to salary), and it needs to be cohesive and supported by linkages to other areas of justice and law enforcement, such as the courts and prison services. This will have practical benefit to front line policing in particular who can utilise timely and relevant knowledge to assist in making decisions in potentially pressured situations, such as making an arrest.

New technology needs to be assessed in terms of its value creation and knowledge dissemination ability, and it needs to be able to support front line policing effectively. This means that it has to be fit for purpose and rationalised accordingly. The practical use of technology for all ranks and roles needs to be analysed in order to make it more effective and increase its availability. For example, management information systems, decision support systems and executive information systems derived for strategic decision making could be implemented on other platforms, thereby freeing up capabilities for front-line systems. The ongoing financial resources required to deliver effective technology paradigms must be set against the potential value they can deliver if utilised to best effect.

In an incredibly complex and data driven world, front line training and education must include greater emphasis on interpersonal proficiency and formal knowledge acquisition. This includes requisite skills, education and training, and the practical inculcation of knowledge management and practice throughout the organisation, at all levels. This has major implications for the recruitment and retention of new recruits and will require recruitment practices that frontload psychological and absorptive capacity testing to identify "knowledge receptive" recruits – particularly those chosen and identified for specialist roles.

It is evident that policing is a complex and varied role, requiring a multiplicity of knowledge and knowledge perspectives. This research has shown that both in the literature and in the data corpus, it is the remit of policing that adds not only to its complexity but levels of uncertainty around how best to manage it. Knowledge is as complex as its remit and to this end, it is imperative that individual's aptitudes for certain knowledge areas or specific roles are ascertained as closely as possible. This will lead to police personnel being assigned to the correct role and the correct knowledge area and build not only on their own knowledge but the knowledge base of the organisation. For example a key component of policing knowledge is not implementing legislation, it is interpreting it. To this end front-line police officers will only engender approval and confidence from the public if they display confidence through their own knowledge ability, which can only come from aptitude, relevant training, and specific and available knowledge.

Training needs to be realigned with real-world goal, and candidate selection needs to be examined in terms of potentiality. Psychological appraisal could be introduced as part of the selection process in order to assess the proclivity of individuals to interpret and rationalise policy and procedure and make suitable decisions based on these and legislative interpretation. These decisions (in some cases) may have to be made in difficult, and as discussed, time-constrained situations. Assessment and aptitude practices need to be more relevant depending on the potential and aptitude of the candidate for certain roles. This will have the effect of identifying and selecting candidates that have a proclivity for certain role functions.

The complexity of policing mandate needs to be set against effective knowledge management training and technology paradigms. This should include specific processes for different and specific areas of policing, (such as specific training programmes that are designed for quick decision making on the front line, the roles of support staff, forensic investigation experts, court presenters, and criminal investigation) as a "one size fits all" knowledge solution is suggested as untenable. Communities of practice with regard to knowledge sharing also need to be encouraged via the use of technology and relevant training processes. For example, through the use efficient knowledge bases, an increase in knowledge effectiveness can be brought about by the implementation and inculcation of intranets and communities of practice; however, it is essential that these are linked in to central repositories and not localised so that they can be made available to all as required.

It is suggested that knowledge needs to be specific, cohesive, and fuelled by clarity and purpose. This inevitably means that specific knowledge solutions need to be implemented for specific sections. In order to rationalise the extent to which policing knowledge is necessary, policing needs to be looked upon as a service and its employees as service delivery personnel. Any knowledge solution must therefore involve recognition of the types of roles that these personnel carry out and requisite training afforded them accordingly. For example, legislative training may not be as important for personnel engaged in office duty, sub-aqua units, or air support as it may be for officers on the front line. Knowledge, while it must also form part of an overarching strategy of modernisation for policing, needs to be as specific as the sections that it seeks to support.

In policing organisations, the rule of law is upheld and enforced by organisations whose primary objective is societal harmony. It is essential that this consensual relationship is underpinned (on the policing side), by knowledge and insight, adequately resourced. A resource unit is therefore suggested as an essential knowledge- gathering enterprise for both primary and secondary data. The remit of this unit (reporting directly to the Chief Knowledge Officer), will be to underpin knowledge management policy and practice with key strategic and operational data, and to ensure that knowledge has a rigorous academic and evidenced based grounding. This unit should also be responsible for the evaluation of knowledge management and practice in the organisation, and its evaluation methodology should be viewed as a positive process, which will help improve knowledge management.

This research is based in real-world policing, and the unprecedented level of access has yielded a data corpus of significant and rich variance. To this end, the implications of many initiatives have been discussed in the data, including issues such as civilianisation, integration, modernisation and renewal, strategic transformation, and various other strategic management initiatives of similar nature. What sets this research apart is not just the positing of a new strategic management initiative, i.e., the implementation of a CKO or Chief Knowledge Officer, but the implementation of a support section specifically designed to implement knowledge and knowledge paradigms and report directly to the CKO. In essence therefore, to oversee the enactment of change via knowledge. The other key issue is that these initiatives have been approved in principal, via a new collaborative venture with An Garda Síochána and Technological University Dublin, to implement these recommendations and document their progress, thereby offering the opportunity to research the progress and results for AGS and other police forces. This is a unique opportunity to view research in action and document the results.

The knowledge gained in areas such as community and social engagement needs to be fed back into the organisation at requisite strategic and operational levels. This can be invaluable in the prevention and investigation of criminal practice. The resource unit could be charged, for example, with the potential re-introduction of the "collators" officer, (a role involving the gathering of knowledge around suspects and suspicious activity) that has been reduced and removed in certain circumstances due to pressure to comply with Data Protection / GDPR regulations. Processes need to be put in place for this to occur, perhaps primarily, the re-introduction of paradigms to encourage discretion and discretionary practices, which have been eroded due to the above and the overabundance of governance policy.

One of the key findings from this work is the recognition that from inside a busy modern and strategically focused policing service, knowledge practices are not cohesive. This research has shown clearly that knowledge practices and policies appear to be desired, appear to be disparate, and not appear to be coherent. The recognition of knowledge as a viable and tangible asset to the policing service is not the question however; the situation as it pertains to policing at the moment is that unless knowledge is not only recognised as a tangible resource but inculcated into organisational psyche as a practical and viable asset, (particularly in training and education), policing will continue to be reactive in a lot of cases where it could and should be proactive. This in itself has led to discernible knowledge gaps, which can be a danger to not just members of the public but frontline police officers themselves.

6.5 Contribution to Knowledge

This work has resulted in four academic publications. Parts of this work were presented at the tenth International Forum on Knowledge Asset Dynamics in Bari, Italy, in 2015 and the seventeenth European Conference on Knowledge Management in Ulster University in 2016. Parts of this work have also been published in the Electronic Journal of Knowledge Management Volume 15, Issue 1, May 2017, and Knowledge Management Research and Practice Volume 17, 2019, issue 1). This centred on the introduction of a public sector knowledge management taxonomic framework, which will allow scholars to identify public sector specifics and nuances through a knowledge management lens, and also enable more informed research into public sector knowledge management.

This work has also produced research on the effectiveness of knowledge management in the public sector which has focused on specific differences and commonalities between public and private sectors, with the aim of reducing the lack of clarity around both.

In terms of generalisability, knowledge practices in policing have been discussed in chapter two,; however, in the context of specific police forces, Seba and Rowley have suggested that UK police forces engage in knowledge exchange and develop knowledge "exchange cultures" (Seba and Rowley, 2010), Caparini and Osland suggest that new police recruits are imbued with knowledge through social interaction (Caparini and Osland, 2017), the report on U.K police knowledge exchange has suggested that hierarchical cultures in policing present obstacles to knowledge sharing (Exchange and Report, 2018). Seba and Rowley also advocate knowledge sharing in policing in the Middle East (Seba, Rowley and Delbridge, 2012).

What is clear from the literature is the corroboration and assertion with this research that knowledge and knowledge practices are not practiced in policing. However, this study has illustrated two key issues. One is the dearth of literature on policing and knowledge management, and two, the findings and recommendations that policing and knowledge are somewhat synonymous, with symbiotic knowledge relationships required not only in relation to crime and criminal investigation but between disparate sections, factions, locations, and cohorts. For example, the Los Angeles Police Department (LAPD) has cited "structural and cultural divisions amongst various units of the Department that sometimes prevent the timely flow of information from the field to training and the reverse" (Glenn *et al.*, 2003). The New York Police Department (NYPD) suggests that its civilian training programme equips its support staff with requisite knowledge needed to support front line police officers (www1.nyc.gov). Furthermore, the Australian Institute of Criminology has suggested that police organisations need to step outside their "traditional" remit and become "Knowledge brokers" (Dupont, 2017).

This lends gravitas to the findings and recommendations contained in this work; however, this work goes further than any other in the field, as it is born of an "inside out" perspective that puts (primarily) the causality of policing first. This, in effect, means that the recommendations are born of knowledge issues that have been cited from policing staff, support staff, management, government, and the literature. Combined, they illustrate key knowledge practices that are absent, highlight the results of disparate knowledge practice, and demonstrate the potentiality of knowledge to make positive change if made available and utilised correctly. Given the structure, scope, and median mandate of An Garda Síochána coupled with its public sector mandates, these knowledge findings are extensive and generalisable to other, similar police forces who seek to put knowledge at the forefront of their strategic practice.

Ultimately, this work's contribution to knowledge is the identification of the state of knowledge awareness, inculcation, and utilisation from inside a modern police force. Commensurate with recommendations as to how to maximise knowledge practice to best effect, this work can be utilised as a methodologically pragmatic policing knowledge appraisal template to afford modern policing a "roadmap" on how best to utilise knowledge.

6.6 Contribution to Practice

This work will aid scholars who wish to study the public sector, or more specifically, security oriented public sector areas, by providing hitherto unavailable data on policing and knowledge management paradigms in policing. With further work scheduled to test the efficacy of the proposed knowledge recommendations, this work is presented as a first volume in a series of public sector knowledge paradigms. It is envisaged that sections of this work will be submitted for publication in leading knowledge management journals, such as the Journal of Knowledge Management® and Knowledge Management Research and Practice®. This work has wider applicability to other police forces and public sector bodies seeking to maximise the potential of knowledge and knowledge management applications.

6.7 Contribution to Theory

The literature has clearly indicated a paucity of research in relation to knowledge management in the public sector (Massaro, Dumay and Garlatti, 2015), and even more so in relation to the security/emergency services and policing (Gottschalk, Holgersson and Karlsen, 2009). This work has added to this area in several crucial respects;

Firstly, it has contributed to the extant literature in the field by publishing several peer-reviewed and cited works in relation to public sector taxonomical frameworks. Going forward, this will aid scholars who wish to research the public sector and public sector knowledge and knowledge management by providing succinct and relevant research in relation to public sector specifics, nuances, and attributes.

Secondly, by gaining unparalleled access to a police service, its echelons, structures and key personnel, this research has gone further than any other in relation to exploiting an area that is under-researched. This has resulted in a rich and varied data corpus from an insider perspective that has been presented against firstly a backdrop of rigorous qualitative analysis which has imbued the results with rigour, validity and foundation, and secondly has produced a set of recommendations grounded in the data that are practical, generalisable, and will result in practical knowledge implementation measures.

Thirdly, (and uniquely) the organisation which is the subject of this case study have agreed to work with the researcher and the University in an unprecedented collaboration. This will result in the implementation of a knowledge management section in the police training college headed jointly by An Garda Síochána and Technological University Dublin. Its aim will be to utilise this research as a starting point for knowledge implementation and implement the recommendations on a pilot basis. This will also form the basis for future research for new further study of public sector knowledge management and also afford an

opportunity document and record the results of this research in real time and in a real world scenario.

In relation to the research question and objectives posed by this work, the role of knowledge and knowledge management in relation to policing is almost paradoxical. Its clarity lies in its complexity. The awareness of knowledge as a multifaceted organisational asset is palpable, however, this makes its implementation and practical usage difficult given the complex remit of policing and the potentially untenable reality of a one size fits all police officer.

The role of knowledge and knowledge management in policing, firstly therefore, needs to be based in awareness, and to this end, the recommendations contained in this work aim to bring clarity to this by recognising the complexity of knowledge and making unprecedented recommendations. These are in relation to specific training parameters, requisite use of technology, and the implementation of specific knowledge roles and sections, such as the appointment of a CKO and the implementation of a knowledge analysis unit to recognise the complexity of knowledge and bring it to the forefront of policing initiatives.

In relation to the contribution of knowledge and knowledge management practices in policing, it is clear that knowledge has a crucial role to play in policing, (Gottschalk, 2006b), and its potential contribution to policing is also clear (Seba and Rowley, 2010). Police personnel are knowledge workers (Richardsen, Burke and Martinussen, 2006), and the necessity of knowledge in policing is beyond question. However, in order to make knowledge more relevant in policing, it must be structured, available, and relevant. The data has indicated that this is what police personnel at all levels require, and the recommendations in this work attempt to bridge the gap between the relevance of knowledge and the practical implementation of it as an effective organisational attribute.

In relation to making recommendations to police management regarding improvements in existing knowledge practice, this research offers unique insights on two levels. The first is the recommendations contained in this work, which, as mentioned, are born of an unparalleled and unique insider perspective coupled with a comprehensive data corpus and rigorous data analysis. These recommendations will allow police forces to address knowledge and knowledge awareness and examine further issues of training, knowledge relevance, and implementation and potential implementation of viable knowledge structures.

Secondly, the further research being undertaken will be published as it unfolds, thereby allowing police management to see the results of this research and assess its effectiveness, learn from it, and tailor it to their own requirements as necessary.

6.8 Limitations

Case Studies

The limitations of case studies have been detailed in chapter four, however, An Garda Síochána have provided unprecedented access to its personnel in the anticipation that the knowledge and knowledge management recommendations put forward by this research will be utilised by the organisation going forward. This suggests an awareness of the existence of issues around knowledge and knowledge management, and it is the knowledge issues identified in this work that could be reduced by the implementation of some or all of these proposals.

Reflexivity

The issues around reflexivity have also been discussed in chapter four, however, the adoption of a functionally pragmatic approach to this research has allowed for objectivity, ostensibly on the part of the researcher, but also the key informants. Reflexivity has been a key issue in this research, and it has facilitated the collection of a rich data corpus, which, coupled with the unprecedented access gained to AGS and the comprehensive interviews conducted, have made this research unique in perspective and rigour. It may have been difficult to compartmentalise and contextualise some of the anecdotal data if objectivity was not present, and simply analyse it for specifics and not causality; and this is the essence of the reflexive approach being aware of it and ensuring that it is understood (Berger, 2015). This is also reflective in of the linear approach taken, not only to the data analysis, but this research project.

Generalisability

As a police force that polices mainly by consent, An Garda Síochána occupies a contextual role in policing in that it polices with the will of the people. Conducting a detailed case study in this type of policing organisation could be interpreted as non-generalisable; however, in the context of policing, An Garda Síochána reflects typical policing values of public sector accountability and mandate, the complexity of service delivery, complicated training parameters, and disparate functionality. All of these traits are to be found in most police forces to a greater or lesser extent, and the idea of policing by consent, while historically referencing the status or ratio of armed to unarmed officers, is more about legitimising a policing service (Jackson, Hough, *et al.*, 2012; Reiner and O'Connor, 2015). This is more relevant perhaps than a simple ratio or proportion of armed to unarmed officers. As such, the generalisability of these findings is evident.

6.9 Insights and Implications
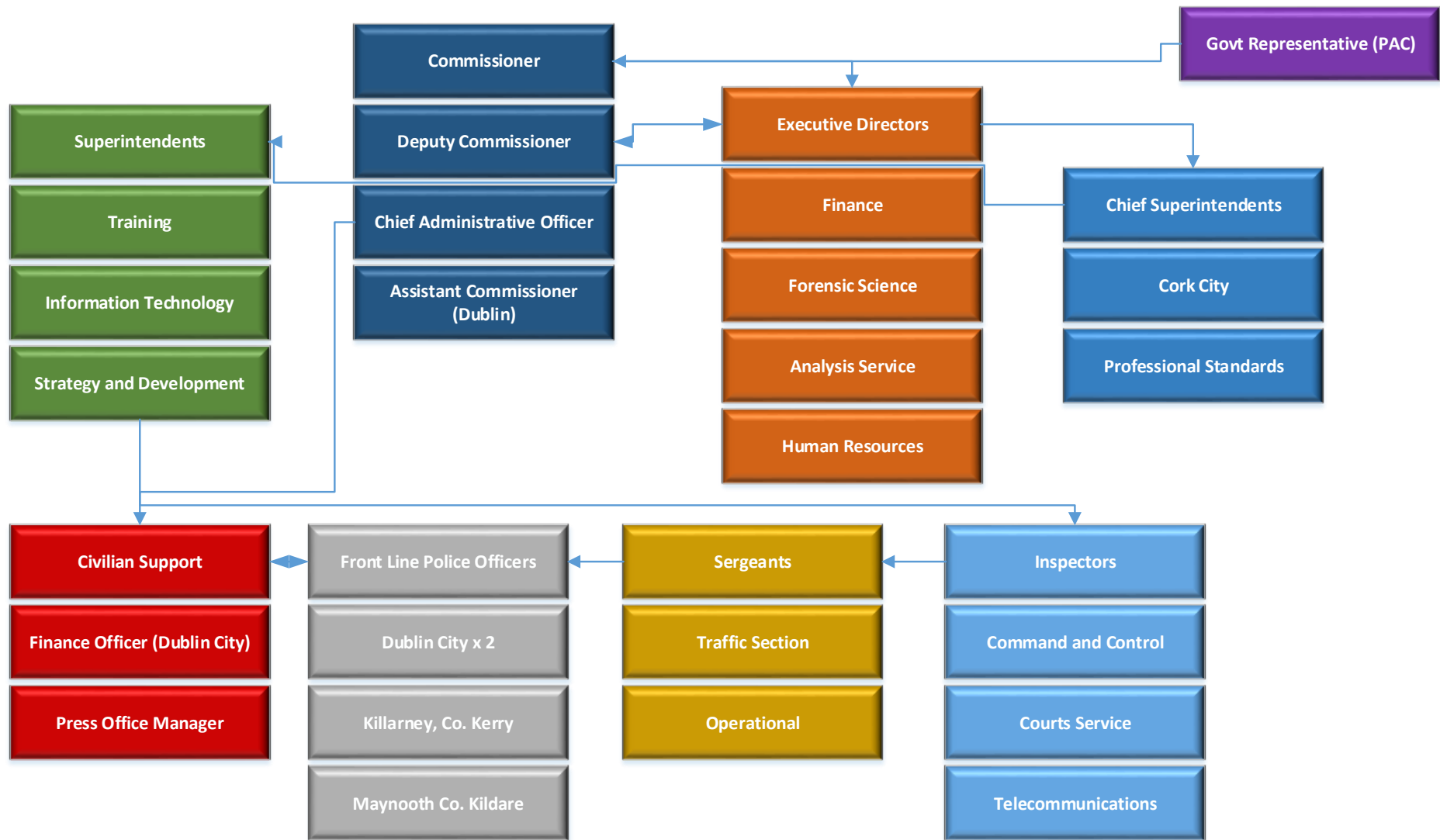
As detailed in the previous page, the insights gained from this work are the result of unparalleled access to all levels of An Garda Síochána, from the Commissioner, to Executive Directors, Chief Superintendents, Superintendents, Inspectors, Sergeants, Civilian staff, and Front line members. Reflecting on the data and on the insights gained, the following table is presented in order to bring clarity to the subject and discuss it in relation to roles and responsibilities;

Table 27 Insights and Implications

Role / Rank / Grade	Key Insight	Implication	Detail	Timeline
Front line Staff	Front line knowledge	More decision making ability. Confidence in role and engenders confidence in the public	CKO and knowledge resource unit will decide on new knowledge guidelines and communication parameters	Will be trialled in 2021
Civilian Support Staff	Increased communication via knowledge portal and re-vamped intranets	More knowledge availability, more awareness and opportunity to feed knowledge back into the organisation. Greater integration between police and civilian staff	This knowledge will result in less siloism and more practical use of knowledge. Overseen by CKO and Strategic Managers	Will be trialled in 2021
Sergeants	More streamlined and relevant knowledge made available for front line policing	More effective arrests, less ambiguity around legislation and the interpretation of same. Less potential for error	Overseen by Regional and Strategic Managers, and results reported through resource unit to the CKO	Trialled in late 2021
Inspectors	Availability of relevant technology to appraise incidents and utilise the information to direct resources more effectively	More relevant deployment of staff and effective dissemination of information	Information disseminated and added to from meaningful utilisation of knowledge	Trialled in 2021
Superintendents	Availability of more relevant knowledge to assist in local decision making	Greater autonomy in order to police districts more effectively	Knowledge and communication channels more relevant and more effective which will aid in competent decision making	Trialled in 2021

Role / Rank / Grade	Key Insight	Implication	Detail	Timeline
Chief Superintendents	Strategic decagon making will be more transparent as it will be based on key insights from knowledge enabled communication	More timely and relevant decisions around policing and more relevant statistical analysis around crime and criminal behaviour	This will result in more relevant knowledge (particularly around crime) being available and more transparent and reliable statistics	Trialled late 2021
Assistant Commissioner	More research into knowledge more evidential based knowledge, and more publications	More effective collaboration with academia in terms of knowledge research and implications	This will result in an increase in evidence based practice around knowledge and knowledge initiatives	Trialled 2021
Executive Directors	More cohesion as regards knowledge communication	More effective communication and collaboration with relevant sections in the organisation and	This will result in more cohesion between sections and directorates	Trialled 2021
Deputy Commissioner	Effective communication with less governance	More rationalised governance structures through consolidation	This will result in more relevant and less onerous oversight	This will be discussed in 2021
Commissioner	The inclusion of knowledge as a key organisational asset	The ability utilise and implement decisions based on knowledge from the CKO and the resource unit	More effective championing of knowledge throughout the organisation	This will be discussed in 2021
Political Oversight	Less governance and more transparency	This (it is envisaged) will precipitate more meaningful dialogue with a view to consolidating the levels of governance	More transparency to the governance processes and more practical support for policing, particularly at the front line	This will be discussed in 2021

6.10 Linkages

With regard to the research question and objectives, in order to offer an overarching solution to the role and contribution of knowledge and knowledge management in policing, it is necessary to firstly gain a clear understanding of the phenomenon of knowledge, its complexity, and the propensity of it to be an organisational attribute, and thus to effect change. This has been done in the comprehensive literature review provided in this research, which took over three years to complete and resulted in several new and novel ways to contextualise and taxonomise knowledge and knowledge management in the public sector.

In order to further understand the role and contribution of knowledge and knowledge management practices in policing, it is necessary to investigate how best it can contribute to the area. This has been completed by utilising a pragmatically based research methodology, gaining unprecedented access to a modern medium level police forces, and from there generating a comprehensive data corpus that is rich in detail and depth. The contribution of knowledge and knowledge management practices in policing is complex, multifaceted, and underutilised. This inevitably leaves the *potential* of knowledge to make a difference in all areas and at all ranks and roles.

In order to make recommendations to other police forces, this research provides a set of key findings based on the literature and the data analysis that are grounded in practical and rigorously robust research. These findings are generalisable insofar as policing needs knowledge, needs to recognise its efficacy, and needs to capitalise on its front line staff, both to engender confidence in the public in which it serves and the people who are charged with providing a service

Therefore, the role and contribution of knowledge and knowledge management practices in policing is one that is complex, multifaceted, overt, however, non-specific in certain areas. The principal reason for this appears to be one of an accepted level of complexity in terms of police knowledge requirement versus the reality that it is virtually impossible to know all there needs to know in

relation to policing knowledge (particularly at the front line). This research, therefore, attempts to bridge that gap by recognising knowledge as a complex, value-adding organisational attribute, and making concrete recommendations aimed at maximising its value.

6.11 Concluding Remarks

Given that the primary remit of policing is the protection of life and property and the prevention and detection of crime, it can be suggested *without evidence* almost that any increase, recognition of, or inculcation of knowledge practice begets an increase in communicative practices and collaboration. This, in turn, (and commensurate with elevated levels of information and knowledge reciprocity), cannot but be of discernible benefit to any organisation. And the literature has yielded knowledge hypotheses in relation to policing and knowledge management to support this. For example, Nordin et.al refer to the wide remit of policing, (Nordin, Pauleen and Gorman, 2009b), Gottschalk discusses knowledge sharing in policing, adding value to processes and procedures by interpreting its complex and varied mandate (Dean and Gottschalk, 2007), and Wakefield has alluded to the links between policing and existing public sector paradigms (Wakefield, 2008).

However, whilst valuing the above as insightful observations and scholarly discussion, they do not encompass the view from inside a modern police force, as postulated in this work. This has come from a linear and progressive qualitative journey that has left the reader in no doubt as to the veracity, authenticity, and rigour that has been applied to this study. The results, albeit unembellished, are based on a methodologically robust process. The comprehensive level of analysis applied to the data would also indicate that the knowledge recommendations suggested in this work are suitable for reflection, analysis, and, ultimately, viable interpretation.

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Appendices

Appendix 1 Overview of PhD Journey

Appendix 2 Examples of Process Coding

1 AC

AC Book2 Process Coding	
Name	**Sources**
Utilising knowledge experts	1
Strategising. Reasoning.	1
Risktaking. Compiling files	1
Networking.	1
Knowledge transfer. Information utilisation.	1
Knowledge losing. Experiencing. Learning. Progressing	1
Interpretation. Legal restrictions	1

2. JC

JMCD Book2 Process Coding

Name	Sources
Transferring Knowledge.Embedded knowledge.	1
Transferring knowledge. ~~Knowledge coding~~Embedding	1
Transferring knowledge Reducing risk	1
Training. Preparing.	1
Training. Lacking. Commending.	1
Training. Experiencing.	1
Training and Timing. Supporting. Decision Making	1
Supervising. Resourcing. Allocating. Recommending.	1
Soloing. Sinking. Swimming. Left ~swinging~	1
Socialising. Allocating (rescources).specialisation ~~Nepotis	1
Sharing. Knowledge. Resourcing	1
Shadowing. Reacting. Training not ~covering~ all the require	1
Retiring. Moritorium.	1
Regulating. Justifying.	1
Redundancy. Adaptation. Training. Following	1
Recruiting. Gaps in recruiting.	1
Processing. Complaining. Investigating. Admonishing. Interna	1
Preparing. Learning	1
Overseeing. Inspecting. Contextualising. Disciplining.	1
Networking. Supporting. Effective Investigating. Abdicating r	1
Looking for knowledge .~~Training. Policing~~Lack of traini	1
Learning. Self Regulation.	1
Learning. Imparting. Assessing. Stabilising. Rostering	1
Lacking in Motivation.	1
Knowledge sharing. Reciprocity of information	1
Isolation.	1
Following. Not leading. Standardising	1
Discretion. Attitude	1
Approaching. Practising	1
Administrating.~~~~Overseeing.	1
Accounting. Disagreeing.	1

Appendix 3 Example of gerund generation

C	Gerunds	Triggers	Reactions	Consequences
Knowledge, as in what you know in a Garda context of what you've learned, may I ask first, how long you have been a member of AGS? 14 years • So, is a further so that you have a wide variety of experience and knowledge in AGS? In procedures practices and everything else like that,Yes • So, how you look upon knowledge in a policing context? I would say it is a combination, it is a combination of procedures, the law and it is experience from dealing with different types of incidents and scenarios. • And would you suggest that that has helped you in your career? Yes because obviously, the more experience you get in those, the more confident you are • So would you equate experience with knowledge?Yes • And has it stood you in good stead in your 13 years as an operational police officer?Yes • And because most of your operational service has been in a rural or mostly rural setting, how has that moulded your view of policing, which is suggest for example that policing in an rural setting is totally different to policing in an urban setting? I have worked in both urban and rural settings, and to compare the two, the knowledge which are dealing with, can vary but still pretty much the same principles that you apply. • And managing that knowledge would you use for example, the obvious example is AGS portal, but other other areas of knowledge, such as repositories et cetera that you would look at or have looked at, to help you Ilegally or procedurally? Yes what I mean you would use the legal section, so your colleagues, you know people who have experience in different areas. • So you would rely on a network of people?Yes • And in terms of your training, or in terms of managing that knowledge that you have built up have you found, that the training was good, was relevant, or have you for example been given continuous professional development and training? There would be CPD so there would be that but maybe not enough.	Networking.	Experience "on the job" training	self training	lack of effective organisational training.The learning comes from oneself. The knowledge gained is self tought

Appendix 4 Public Sector KM Frameworks in the Literature

Author	Framework	Public Sector Based	Adapted for Public Sector
Cong & Pandya (2003)	Conceptual KM Framework for the public Sector	Yes	No
Koolmees et.al (2008	A KM "scan" and "barometer" for the measurement of public sector performance	Yes	No
Parker / Bradley (2000)	A model to assess public sector culture	Yes	No
Girard & McIntyre (2010)	A model based on the "Inukshuk" model of key change agents that contribute to KM in the public sector.	No	Yes
Mir & Rohamen (2003)	Theoretical framework based on Nonaka's "SECI" model. Used to develop KM practices in a state mail service	No	Yes
Mc Adam & Reid (2000)	Modified version of "Demerest's" model for studying perceptions of public and private sector KM	No	Yes
Pietrantonio (2007)	Balanced Scorecard adoption in public administration in Italy	No	Yes
Chong & Salleh (2013)	Integrated KM framework that interconnects KM enablers, knowledge sharing processes and organisational performance in public sector accounting	Yes	No
Amayah (2013)	Model devised to test factors affecting individual knowledge sharing in the context of a public sector organisation, the model is generated using stepwise regression analysis	No	Yes
Jain & Jeppesson (2013)	This study used KMAT (Knowledge Management Assessment Tool, based on the works of Anderson, and investigated the importance of studying KM practices in the public sector	No	Yes
Chawla & Joshi (2010)	KMAT (Knowledge Management Assessment Tool) to investigate public sector performance in India	No	Yes
Mercer (2005)	Development of a knowledge management framework based on environmental risk, organisation and political theory	Yes	No
Sotirakou & Zeppou (2004)	Development of the Mate Model, a KM strategic technique used for modernising government organisations	Yes	No

Alhamoudi (2011)	This study utilises the Balanced Score Card for measuring and managing productivity in the public sector	No	Yes
Samara (2007)	Development of framework to assess structured and unstructured information in pedagogical practices	Yes	No
Salleh & Chong (2013)	A model developed to investigate the extent of influence of learning factors on tacit K sharing among public sector accountants	Yes	No
Burford & Ferguson (2011)	Study of frameworks in the public sector and their level of applicability in order to enhance KM efforts	Yes	No
De Gooijer (2000)	This study proposes a threefold model for measuring public sector performance, and one of the sections includes the use of the balanced scorecard methodology	No	Yes
Metaxiotis (2008)	This study proposes a conceptual model as a good research starting point to assist local governments develop and capitalise on more effective knowledge base stakeholder partnerships	Yes	No
Omona (2010)	The purpose of this paper is to develop and empirically assess the validity of a proposed conceptual framework for enhancing knowledge management using ICT in higher education	Yes	No
Cegarra & Navarro (2012)	The development of a structured equation model to evaluate patient records in health services	Yes	No
Abdullah & Dale (2009)	This study proposes the development of a generic public sector KM framework to act as a framework for future research and organisational development in the public sector	Yes	No
Bui & Baruch (2010)	This paper offers an application of a systems model for Senge's five disciplines in higher education, (HE) Institutions. It utilises a conceptual framework for the analysis of antecedents and outcomes of Senge's five disciplines	No	Yes
Bote (2013)	The development of a cost calculation model to assess the cost of digital preservation of records in health care	Yes	No
Capece (2008)	This research proposes an acceptance model of information and communication technologies and a measurement framework for students in higher education	Yes	No
Danesghar & Bosanquet	This study proposes a taxonomic model for measuring customer knowledge and attempts to	Yes	No

(2007)	"tap in" to the tacit knowledge possessed by librarians in academic libraries		
Wai Chai & Songip (2010)	This paper proposes a framework for investigating soft elements of KM implementation in higher learning institutions	Yes	No
Handzic (2007)	This paper looks at the implementation of a knowledge audit model to measure knowledge-based assets in local govt org in Sarajevo	Yes	No
Garcia (2007)	The development and use of an existing taxonomic model to appraise e-learning concurrent with identifying and describing the role of the knowledge worker in such areas as higher education. This study has adopted Carrillo's generic system of capitals, an integrative KM3 taxonomy to assist in identifying knowledge worker roles	No	Yes
Laihonen & Sillanpaa (2014)	This study looking at process measurement and the challenges of measuring service effectiveness. Uses Choo's process information model to aid in assessing the effectiveness of public welfare services	No	Yes
Korres (2008)	This paper aims to develop a linear model of assessing personalised learning objects for educators in a technology enhanced learning environment.	Yes	No
Lavoue (2011)	This study looks at the development of a KM tool for interconnection of communities of practice in higher education	Yes	No
Jing (2012)	KM and SCM proposal to integrate two models to enhance curriculum design in universities in Thailand	No	Yes
Danesghar & Parirokh (2007)	This paper looks at a conceptual model and how it maps to knowledge sharing in academic libraries. It uses Nonaka's SECI model as a template and precursor to its development	No	Yes
Wu He (2013)	This paper proposes a specific conceptual framework for mapping knowledge flows in special education	Yes	No
Ranjan (2011)	This study proposes a framework in order to look at how Knowledge is shared and utilised in higher education	Yes	No
Metaxiotis (2003)	The development of a framework to look at how KM enhances the capability of higher education institutions as learning organisations	Yes	No

Appendix 5 Knowledge Dichotomies

	Knowledge Dichotomies
1	Implicit - Explicit knowledge
2	Individual – Organisational &collective Knowledge
3	Internal - External knowledge
4	Knowledge as a process - Knowledge as a product
5	Undocumented - Documented knowledge
6	Structured - Ordered & unstructured knowledge
7	Relevant – Irrelevant knowledge
8	Objective – Subjective knowledge
9	Knowledge from experiences – Knowledge from rationality
10	Public – Proprietary knowledge
11	Actual – Future knowledge
12	Public – Scientific knowledge
13	Industry specific – Firm specific knowledge
14	Complex – Simple knowledge
15	Hidden – Visible knowledge
16	(Electronically) inaccessible – (Electronically) accessible knowledge
17	Unsecured – Secured knowledge
18	Informal, unapproved – Formal institutionalised, approved knowledge
19	Specific, particular, contextualised – Abstract, general de-contextualised
20	Codified – Uncodified knowledge
21	Abstract – Concrete knowledge
22	Undiffused – Diffused knowledge
23	Declarable – Non-declarable knowledge
24	Observable – Non-observable knowledge
25	Autonomous – Systematic knowledge
26	Positive – Negative knowledge
27	Low value – High value knowledge
28	Historical – Potential knowledge

Appendix 6 Practitioner Information Sheet

Practitioner information sheet

- **Purpose of this study.**

As part of the requirement for my PhD at TU Dublin, I am currently carrying out research in relation to knowledge and knowledge management in policing.

- **TU Dublin Student**

It is important to point out that while I am a member of An Garda Síochána, the study is conducted is within the context of my studies at TU Dublin

- **What will this study involve?**

This study will involve conducting a series of semi-structured interviews, which will then be analysed with a view to informing an assessment of knowledge and knowledge management as mentioned above.

- **Why have I asked you to be involved in this study?**

I have requested some of your time to interview you because you work within a key/pivotal area in a support area for An Garda Síochána and your insights will be valuable in gathering primary research data.

- **Do you have to take part**?

Participation in this study is entirely voluntary. Permission has been granted by the Garda research unit and the heads of both and civilian human resources, and while that may not have any bearing on your own validation processes, it is important to point out that the process has been approved by AGS. However, please be assured you are under no obligation to participate and you can withdraw at any stage before or during this process. Moreover, if you do not wish your interview data to be treated as part of the study you can request this of me at any point and it will not be included.

- **Will your participation in this study be kept confidential**?

Your participation will be kept confidential and any information supplied will be treated with the utmost confidentiality. If details are quotes are taken from an organisational standpoint, this will be given to you to review the accuracy of comments. Data will be stored securely on the researcher's laptop and a backup copy USB memory stick. Both of these will be encrypted.

- **What will happen to the information you give?**

The results will be presented in a PhD thesis. This will be seen and approved by my supervisors, the Garda research analysis unit, a second marker and an external examiner. This thesis may be read by future students, and parts of this study may be published in academic journals or at academic conferences.

- **What are the possible disadvantages of taking part**?

Ostensibly there are no negative consequences of taking part. It will be an opportunity to present a balanced viewpoint on the phenomenon of knowledge in the organisation and knowledge solutions that will be proposed may be of significant value to An Garda Síochána in the future.

- **Any further queries**.

If you require any further information, you can contact me: Paul McEvoy, on 086 8283436, or you can email me at paul.mcevoy@garda.ie, or paulmcevoy@tudublin.ie

Thank you very much for taking part in this study

Appendix 7 A History of An Garda Síochána

Like a lot of police forces, An Garda Síochána stems from a military background, and following the declaration of Irish independence in 1916, the Royal Irish Constabulary and the Irish Republican Police were amalgamated into the Irish Civic Guard in 1922. This was replaced by a constitutional act in 1923 which effectively renamed the Civic Guard," An Garda Síochána". This new organisation merged with the Dublin Metropolitan Police in 1925 to form a consolidated civil police force.

The first recruits to An Garda Síochána were "sworn in" (a process of becoming a sworn police officer which involves taking an oath to serve the people, the country and uphold and administer the law), on the 21st of February, 1922. Members of this new organisation appeared on duty for the first time on 18 April 1922 when they marched, without uniform, in the funeral procession of Frank J. Lemass, a local politician.

At that stage, Mr. Eoin O'Duffy had replaced Mr. Michael Staines as Garda Commissioner and the civil war in Ireland had broken out. This had the effect of restricting the allocation of the newly appointed police officers to the capital city of Dublin as this was where they were most needed. Swords, in North County Dublin, was the first town to receive an allocation of Guards in September 1922 and by the end of the year over 2,000 guards had been allocated to 190 stations countrywide.

Appendix 8 The Evolution of Policing in Ireland

On 17 December 1922 members of the Civic Guard moved to their new headquarters at the Phoenix Park Depot.   Until the mid-1920's crime increased greatly in Ireland and it became evident that an unarmed force alone could not cope with continual confrontations with armed criminals. As a consequence of this the Garda Special Branch was set up in 1925 with approximately 200 staff. It was also in 1925 that the Civic Guard, under its new name An Garda Síochána, amalgamated with the Dublin Metropolitan Police (DMP).

The middle years saw the outbreak of World War II, otherwise known as 'The Emergency', and the necessity to recruit a special force "An Taca Síochána" to supplement the existing strength. This special force proved a major success and after a short period its members were appointed as permanent members of An Garda Síochána.

Post war, An Garda Síochána did not change substantially until the late 1950's when under Commissioner Daniel Costigan, pay and conditions were reviewed. This led to the establishment of the "Conroy Commission" which reported in 1970 and recommended much changes in the way pay and allowances were calculated and assessed.

Appendix 9 Recruit Training

In 1985 following a detailed review, the training structure was radically overhauled. The Report recommended major changes in the content, structure and duration of basic training for new trainees. A two-year five-phase programme, which was to replace the existing two-phase system, was introduced. In 1989 An Garda Síochána, for the first time, undertook service as a police force with the United Nations - with a delegation to Namibia to supervise elections.

Since then An Garda Síochána has been responsible for the implementation and interpretation of criminal legislation in Ireland, the provision of a policing service, which includes the providing for the safety and security of the state, and the preservation of law and order.

Police training in Ireland is undertaken at a refurbished Army Barracks (The Mc Cann Barracks) which has been renamed the "Garda College". It is located in Templemore, County Tipperary in Ireland and all Irish police personnel have been trained there since 1964, when it relocated from the Phoenix Park in Dublin. All training is under the command of the Assistant Commissioner, Human Resources, who is responsible for the overall education, training, and development within the Force. The Academic Co-ordinator of the College is a member of Chief Superintendent Rank who has responsibility for all college activity. The Garda College also provides for a continuum of education/training from Student Garda / recruit stage up to professional development and retirement courses.

Upon joining the Force the student police officer undergoes a two-year comprehensive education/training programme. The programme is divided into five phases, three of which are conducted at the College and two phases at selected Garda Stations. The aim of the course is to ensure that Gardaí are capable of competently fulfilling their Police role and have a sound

theoretical basis for adapting to meet the demands of a modern society throughout their service. Further education, training and development courses are provided at regular intervals as part of an overall training programme.

Appendix 10 The Dublin Metropolitan Region

The Dublin Metropolitan Region

The Dublin Metropolitan Region comprises Dublin City and portions of adjoining counties. Because of regional policing specifics and population density (it is estimated that forty four percent of the Irish population reside in the Greater Dublin Area), it has an organisational schema which is policed differently from that provided for country areas, (i.e. outside Dublin).

From a policing perspective, the capital city is divided into six divisions: the Eastern Division, the Northern Division, the North Central Division, the Southern Division, the South Central Division, and the Western Division, with a Chief Superintendent in charge of each. Each division is divided into districts with a Superintendent in charge of each district.

Dublin, like most cities, poses logistical policing problems in that it houses the centre of Government, and also has within its confines the residence of the President of Ireland; the House of the Oireachtas (Parliament), various Embassies, residences of members of the Diplomatic Corps; and the Central Criminal Courts of Justice. It is also the centre of various national and international sporting and entertainment events, all of which make heavy demands on police personnel.

Outside Dublin, divisions correspond in area with counties from which they take their names. In a number of cases, however, two adjoining counties have been grouped to form a division. A Chief Superintendent has overall responsibility for supervisory and inspection functions within his/her area of command. A division is divided into districts with a Superintendent in charge of each.

Appendix 11 AGS Protocol for Research

An Garda Síochána Protocol for Research

This document is intended to formalise the relationship between An Garda Síochána and any researcher (Garda member, student, academic institution, practitioner or agency) carrying out research into or on behalf of An Garda Síochána.

On completion of the research, we ask the researcher to submit to An Garda Síochána a summary report of the research findings for internal publication. External

This document is to be completed for research either funded or not by An Garda Síochána. This includes any individual, academic institution or agency requesting the assistance of An Garda Síochána data, personnel or resources.

	Contact Details
Name	**Paul Mc Evoy**
Org / Uni / Dept	**College of Business. Dublin Institute of Technology. Aungier St.**
Address	**Dublin Institute of Technology. Aungier Street. Dublin 2**
E-mail	**paul.mcevoy@dit.ie**
Phone	**086-8283436**

	Please give details of the research aim, methodology and design.
1) **Research Aim and Design**	**a) What is the aim of the research?** The aim of the research is to advance the awareness of knowledge management as a viable business phenomenon in AGS. It is an area that can potentially deliver substantial benefit to the organisation vis a vis the identification of knowledge intensive areas and specific knowledge processes. It will also provide valuable information to the succession planning initiatives currently underway which will form part of the modernisation and renewal programme. The researcher is a fourth year part time doctoral student under the supervision of Professor Amr Arisha, head of the Graduate Business School, Dublin Institute of Technology, Aungier Street**.** The ultimate aim of the research is to appraise and analyse the current state of knowledge and knowledge management in policing using AGS as a case study **b) What methodology do you intend to use?** This study espouses a qualitative approach to the data incorporating sequential modes of data coding within the context of an overall research aim. This design is useful as it builds iteratively on the outcome of previous research or phases in the design process. It is ideally suited to research that postulates the idea of knowledge appraisal and commensurate findings and recommendations as it allows the research design discover elements of causality and equally, reflection. The initial phases of this research approach are centred on the development of a public sector taxonomic knowledge framework. The preliminary qualitative phase of this research will allow the gathering of information pertinent to the topic, which will then be analysed through several rigorous coding cycles

The results of the first cycle of coding (process coding) will feed into the second phase (in-vivo coding). This will be followed by thematic analysis. The results will then be proposed a series of findings and recommendations aimed at highlighting knowledge gaps and suggesting pertinent ways in which these can be reduced or removed.

In the case of this study, it is proposed to interview key respondents in An Garda Síochána, at all ranks and at all levels of responsibility. This approach is best suited to answer research questions and objectives which require a diversity of data and a qualitative agenda.

c) **What sample of participants is required & how will they be recruited? (Please state no. of interviews, interviewee type and detailed method of accessing them)**

It is envisaged that up to 25 interviews will be held with key informants from all levels in AGS, from front line police officers, to key support staff, and from the Commissioner to Executive Directors at all key areas.

Semi Structured interviews will be selected for this stage of the research for the following reasons;

- Given the limited amount of research on public sector knowledge management, an inductive approach to interviewing was felt prudent. This would aid in the collection of qualitative data (Saunders, Lewis and Thornhill, 2009; Seba, Rowley and Delbridge, 2012).

- Semi structured interviews allow for flexibility in exploring salient issues while also retaining a structure of questions (Becker, Bryman and Ferguson, 2012).

- Semi structured interviews can provide insights and explore new territory during the course of an interview that were not envisaged outset (Bryman, 2015; Bryman and Bell, 2015).

Semi structured interviews will also facilitate the researcher from an interpretivist standpoint, as they will enable the generation of opportunities to explore meanings and contextual contents as it arises (Saunders, Lewis and Thornhill, 2009)

The interviews for this research will be pre-scheduled and are expected to last up an hour. Interviewees will be encouraged to share their insights and experiences and elaborate on their answers where necessary. In order to avoid interviewer bias (Easterby-Smith, Thorpe and Lowe, 2008), open ended questions will be utilised and the interviewer will not express an opinion on any matters discussed in the interviews (Boyce and Neale, 2006).

The interviews will be transcribed and analysed in a rigorous methodological fashion (as detailed) (Tranfield, Denyer and Smart, 2003; Braun, V. and Clarke, 2006). Computer aided software will be used to facilitate the process of analysis. It is envisaged that software such as "Nvivo" will be utilised for this purpose. This software allows for pattern analysis and teams which will may emerge from the data.

Data collected will be relevant to knowledge management and knowledge procedures. It will not be necessary to elicit data re crime, criminal investigations, or details pertaining to injured parties, members of the public or the judiciary.

With this in mind, I would like to make application to interview the following personnel;

Garda Personnel		
Rank	**Section**	**Reason for interview**
Commissioner	Commissioner's Office, Garda HQ	To elicit top management perspective on knowledge management in AGS, it's potential, relevance and possible inculcation into organisational culture and consciousness.
Deputy Commissioner. Governance and	Garda HQ, Dublin.	To ascertain the effectiveness of KM initiatives in AGS and possible relevance to strategic initiatives. To investigate the merits of

		Strategy		Knowledge assimilation and dissemination and the current levels of expertise in various roles throughout AGS
		Assistant Commissioner, Dublin Metropolitan Region	Garda HQ, Harcourt Square, Dublin	To investigate the possible / potential effects of KM in the area of front line policing. To discuss the possible uses for knowledge and knowledge sharing, and to ascertain the relevance of identifying knowledge holders.
		Chief Superintendent, Anglesea Street	Anglesea St Garda station	To ascertain the relevance of knowledge and knowledge management initiatives in a regional frontline operational setting.
		Superintendent I/C, Garda I.T Section	Garda HQ	To analyse the relevance of codified knowledge and knowledge initiatives. To investigate the propensity of KM to aid in the investigation process and to highlight the essential differences / commonalities between the data, information and knowledge
		Inspector I/C Court Service,	Bridewell Garda Station	To ascertain the relevance / effect of knowledge management and its potential to aid in legislative processes and procedures
		Sgt I/C Traffic Corps	Dublin Castle	To investigate the possible relevance of KM to front line policing. To ascertain the role and potential of knowledge portals, personnel and procedures to the policing process.
		Members of Garda rank x 4	Store St Garda Station. Co. Dublin Buncrana Garda Station. Co. Donegal	To ascertain the relevance and potential of knowledge management, knowledge sharing initiatives, and knowledge collaboration for front line police officers in four diverse police locations. The busiest police station in the country, a rural police station, and a police station that straddles the boundary between the two.

		Athlone Garda Station. Co. Westmeath	
	Inspector I/C Command and Control	Garda HQ, Harcourt Square	To look the role of communication and information in the emergency despatch centre and see how knowledge could be situated at increasing efficiency
	Chief Superintendent, Garda Technical Bureau	Garda HQ	To look at the roles of specific experts in areas of crime investigation, such as fingerprints, ballistics, etc, and ascertain the relevance of expertise within AGS through these roles
	Superintendent, Office of the Deputy Commissioner, Governance and Strategy. (Administrator of the Garda Síochána Portal)	Garda HQ	To ascertain the role of the Garda Síochána portal in the delivery of information and knowledge via the electronic portal in use in the organisation at present
	Chief Superintendent, AGS College	AGS College, Templemore, Co. Tipperary	To ascertain the extent and relevance of knowledge management initiatives in the training programmes in AGS and to discuss the possibility of introducing same.
	Civilian Personnel		
	Grade	**Section**	**Reason for Interview**
	Executive Director HRM	Garda HQ	To ascertain the relevance of knowledge management to hr strategies particularly in

	(Garda Staff)		relation to new entrants and departing employees. Knowledge transfer and sharing would also be of significant interest and relevance to HR strategies.
	Executive Director HRM (Civilian Staff)	Garda HQ	To ascertain the relevance of knowledge management to HR strategies particularly in relation to new entrants and departing employees. Knowledge transfer and sharing would also be of significant interest and relevance to HR strategies.
	Executive Director of Strategic Transformation	Garda HQ	To investigate the possible inculcation of knowledge management strategies and the identification of knowledge roles and processes within the organisation as it moves forward.
	Executive Director of Finance and Services	Garda HQ	To investigate the level of expenditure on new initiatives in the organisation and what, if any, financial resources could be devoted to information and knowledge initiatives.
	Head of Garda Internal Analysis Section	Garda HQ	To investigate the statistics with regard to effectiveness across investigation processes in AGS. To ascertain if knowledge and knowledge management can play a role in this area and if the identification of knowledge as an organisational asset can assist in reporting and analysis processes
	Head of Forensic Science	Garda HQ	To ascertain the potential of knowledge management in the investigation of crime and to investigate the potential of collaborative ventures across similar organisations, particularly with regard to areas such as communities of practice.
	Higher Executive Officer	Garda Press Office	To investigate the role of information dissemination in AGS and to ascertain if it is an area in which knowledge management can be of benefit

	Clerical / Executive Officer	Garda station Pearse St	To investigate the possible advantage of km in administrative duties and how it could be of benefit in bridging the gap between administrative and policing roles.

2)

AGS Contributions required for research?

Please give details of any An Garda Síochána contributions required of the research.

a) **An Garda Síochána Sponsor / Contact**

Mr. Alan Mulligan. Executive Director of Civilian HR

Mr. John Barrett. Executive Director of Garda HR

Superintendent John Keegan. Office of the Deputy Commissioner, Governance and Strategy.

b) **Access to An Garda Síochána Data (Please specify whether aggregated or personal data is required)**

Aggregated data

c) **Access to An Garda Síochána staff (Rank, roles, unit, responsibility, quantity)**

Access will be required to a variety of Garda and Civilian Staff, primarily in managerial roles. However, it is envisaged that access to Garda and Civilian front line staff will be necessary

	d) **Access to An Garda Síochána IT systems (Specific equipment, software or speciali techniques)**
	Not envisaged at this juncture.
	e) **Access to An Garda Síochána sites**
	An Garda Síochána Portal.
	f) **Is your research funded by the An Garda Síochána.**
	N/A
	g) **If it is not An Garda Síochána funded, please specify who is the funding body**

	Self / Funded
	h) Any other contributions
	N/A
3) **Timescales and Deliverables**	**Please give details of any timescales or milestones required of the research. (Please include details of your access to An Garda Síochána resources; security clearance; data collection and analysis; final reporting, publication etc)** I am a member of AGS with requisite clearance, and as such would have access to internal Garda Mail, the Garda Portal, and the Pulse system. Interim reports and progress will be communicated to the Executive Directors of HR (Garda and Civilian), and Dr. Mary Walker, Garda Research Unit, Garda College. It is envisaged that this research will be finalised in 2020, when the final thesis will be submitted for evaluation.

4) **Corporate &** **Strategic** **Context**	**Please give details of the corporate context of the research and its scope with respect to internal or external stakeholders.** a) **How does the proposal meet An Garda Síochána strategic priorities?** **This proposal will have benefits for An Garda Síochána's corporate strategies / priorities for the following reasons;** This research will illustrate the current landscape of knowledge environment within An Garda Síochána which is a median level police force that police's by consent. This data then be utilised to identify knowledge gaps, and illustrate the current issues in relation to knowledge and knowledge management. Given a lack of awareness and analysis of knowledge management in the public sector generally (Cong and Pandya, 2003b; Jain and Jeppesen, 2013), and the dearth of research into public sector military and police organisations, there is clear scope to examine aspects

	of knowledge and knowledge management processes within An Garda Síochána
	This will also be of benefit to the succession planning strategy in An Garda Síochána, as it may act as a foundation for the identification of key personnel in strategic positions, areas / roles of strategic relevance, and will illustrate areas where knowledge utilisation can play a pivotal role in strategic direction.
	b) What are the expected benefits of the research? As detailed above **c) Who are the likely audiences for the products of the research?** An Garda Síochána, policing bodies and institutions, public sector bodies, academic institutions, and local government bodies **d) Any internal / external stakeholders, units, agencies or institutions involved?** Technological University, Dublin.
5) **Next Steps**	**Would you be happy to present your findings to an An Garda Síochána-wide audience in an academic seminar?**

	Yes Yes ☐ No

Completed by: **Date:**

Part 2: Meeting the AGS requirements

(To be read and agreed by the Researcher)

- o To assure anonymity and confidentiality, when handling data or other information provided by An Garda Síochána I / we will ensure the requirements of the Data Protection Act are maintained.
- o I / we will acknowledge An Garda Síochána as a source of information in any final report.
- o I / we will acknowledge those that carried out any original analysis / research or collection of data and declare they have no responsibility for further analysis or interpretation of it.
- o I / we will submit a summary report detailing the aims, methods, findings and implications for policing to An Garda Síochána.
- o I / we understand that I / we may be invited to present the research findings before an internal An Garda Síochána audience in an academic seminar.
- o I / we will give access to the data / information only to persons directly associated with the project. The data will not be used in connection with any other analysis except that outlined in this document.
- o I / we will maintain a list of all persons who handle the data / information provided.
- o I / we will consult with the An Garda Síochána regarding any media interest in this project.
- o I/ we will establish whether security clearance is required to undertake the proposed research, and complete any necessary applications relating to this.

Name (Block capitals)	Signature	Date
1:		
2:		
3:		
4:		
5:		
6:		

Appendix 12 Research Interview Questions

<u>RESEARCH INTERVIEW</u>

The purpose of this study is to assess the current state of Knowledge Management in the public sector and explore the potential of knowledge and knowledge management in a policing context.

I would like to remind you that should you wish to stop this interview for a break or no longer wish to participate; you are free to do so.

Do you have a question for me before me before we start?

Demographic Information

Job Title :	
Age:	
Job Level:	
Number of employees :	
Nature of Role:	

General KM

1. How would you define *knowledge* in a business context?

_____

_____

_____

2. What do you understand by the term "*Knowledge Management*"? Were you previously aware of it?

_____

_____

_____

3. Does An Garda Síochána suffer from knowledge loss, i.e. losing knowledge when employees leave, transfer or retire? If yes, how, and explain. If no, please elaborate.

---

4. Where would you see the potential benefits of Knowledge Management in a policing context?

KM in PS

As AGS is part of the wider public sector, in this section I am trying to understand how specific public sector attributes and influences can affect knowledge and knowledge sharing within AGS.

5. In your view, what national and international trends are currently influencing management in the public sector and AGS?

---

6. How would you describe the culture in AGS? Do you feel it could have an impact on Knowledge Management within the organisation?

---

7. How would you describe the governance / reporting structure of AGS?

_____

_____

_____

8. How would you describe the relationship between AGS and other public and private sector organisations?

_____

_____

_____

9. How do you feel about new public management's initiatives and their effect on policing?

_____

_____

_____

10. How do you feel about the relevance and security of data given IT predominance in policing today?

_____

_____

_____

11. Would you see a policing service as accountable to government or the public? And why?

_____

_____

_____

Knowledge Assessment

12. Do you think it would be useful to assess the individual knowledge AGS members? If yes, why? If no, why not?

_____

_____

_____

13. Are you aware of any knowledge assessment practices currently implemented in AGS?

_____

_____

_____

14. To what extent, and why, do you think the following factors affect knowledge in policing?

    i. Education
    ii. Experience
    iii. Training
    iv. IT Literacy
    v. Business Communications
    vi. Business Process Interactions
    vii. Personal Network
    viii. Performance
    ix.
    x. Innovation

_____

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_____

Thank you very much for you time. Do you have any questions for me with regard to the interview? I will transcribe this interview and send you a copy of the transcribed script in order to validate what has been discussed. I would like to reassure you that total confidentiality will be maintained during the transcribing and reporting processes. All personal detail will also be protected at all times. At any point, should you wish all or part of this interview or its detail to be redacted or discarded, it will be done. Thank you for participating in this study.

Appendix 13 Interview Questions and Topic List

Question	*Why do I ask*	*Areas that could be discussed*
How would you define *knowledge* in a business context?	We need to reveal the extent of the recipient's knowledge of the topic and how their interpretation of knowledge could effectively be revealed in relation to organisational capacity	Varying levels of understanding with regard to knowledge as a term and the relevance of it to the organisation
What do you understand by the term "*Knowledge Management*"? Were you previously aware of it?	We want to understand the levels of awareness of the phenomenon of KM and from there possibly adduce the relevance of it.	A lot of understanding of the necessity of information and how it is processed, and possibly a little about the practicalities of effective KM and its assimilation and dissemination
Does An Garda Síochána (AGS) suffer from knowledge loss, i.e. losing knowledge when employees leave, transfer or retire? If yes, how, and explain. If no, please elaborate	We need to ascertain where, why and how knowledge loss takes place, in order to understand the most pertinent ways to analyse knowledge loss that its implication.	A description of the knowledge believed to be held in the organisation however, this is not to be confused with information or indeed the intention to codify knowledge in explicit format only.
Where would you see the potential benefits of Knowledge Management in a policing context?	It is hoped that we can gain an understanding of the potential benefits of knowledge management in the policing and public sector context. In relation to policing particularly, it is envisaged that we can elicit from information around the relevance of knowledge in an investigative climate, and look at the potential for its use in a global policing context	It is envisaged that we will hear about collaborative practices within a policing context and use of the police "knowledge portal" as a potential hub of information. It is also anticipated that we will hear about the new initiatives that are underway in An Garda Síochána, such as the modernisation and renewal programme et cetera.
In your view, what national and international trends are currently influencing management in the public sector and the AGS?	In asking this question we are trying to ascertain information and opinion on new public management, global policing, and specific initiatives currently underway in policing. We are also trying to ascertain future initiatives and direction.	We would expect to hear more detail on the modernisation and renewal programme and other initiatives underway in Irish policing. We would also hope to hear about the IT initiatives underway and how they are leading to increased collaboration with other international police forces

Question	Why do I ask	Areas that could be discussed
How would you describe the AGS culture? Do you feel it would have an impact on Knowledge Management within the organisation?	Very important, as it can mean the success or failure of knowledge sharing. Given the idiosyncrasies of public sector culture and indeed the disparate nature of security-oriented sections such as police, military et cetera, it is imperative that we gain an insight into police culture and the potential impact of knowledge management on it.	We would expect to hear details on cultural specifics such as insularity, accountability, and government intervention.
How would you describe the governance structure of AGS?	This question is designed to ascertain the relevance of hierarchy in AGS and in the public sector, it will allow us to gain an insight into the structure, reporting parameters and reporting processes in the organisation, and how this has the potential to inhibit or enhance knowledge flow and sharing	We expect to hear specific detail on hierarchical structures and public sector governance. We also expect to be able to ascertain the relevance of knowledge flow in the organisation vis a vis the "classical" public sector hierarchical model. This will also allow us to investigate the relevance of our published public sector taxonomy
How would you describe the relationship between AGS and other public and private organisations?	We want to get from this question is context. The context of overall policing relationships in a national and international context. We also want to investigate the phenomenon of knowledge transfer and sharing	We expect to hear about collaborative practices, partnerships, policy formulation and possible the use of IS/IT to promote knowledge sharing. We may also elicit information in relation to knowledge retention and hoarding.
How do you feel about new public management's initiatives and their effect on AGS?	What we are trying to elicit from this question is information in relation to reform initiatives and new processes and procedures that are shaping the future of policing, (and the public sector in general)	We expect to hear about new programmes and policies and how the interviewees will see the future of AGS, and how the new processes will aid or inhibit policing standards and structures.

Question	Why do I ask	Areas that could be discussed
How do you feel about the relevance and security of data given today's IT predominance in today's policing?	What we are trying to ascertain is the predominance of data, data protection, and IT relevance. This is important given the potential of IT to dominate policing and knowledge sharing.	We expect to hear about discretion, autonomous policing, data, information, and how stored information can be used effectively. We would also expect to hear about the reliance on technology and the possible overuse of it. (GDPR will also (no doubt) be mentioned)
Would you see a policing service as accountable to government or the public? And why?	We are trying to understand the possibilities and potential of accountability, and the possible inhibitors on a police service and structure. Ultimately, this can inhibit or enhance knowledge flow and sharing	We expect to hear about potential issues with processes, accountability, policing structures and governance.
Do you think it would be useful to assess the knowledge of AGS members? If yes, why? If no, why not?	We are trying to get to the heart of the relevance of individual knowledge and obtain data in relation to the awareness of individual knowledge holders in AGS	It is hoped in this question that we will obtain data in relation to the areas around individual expertise and knowledge and that recipients or interviewees will be able to inform the research about the benefits and practicalities of individual knowledge and identification of knowledge holders.
Are you aware of any knowledge assessment practice implemented in the AGS?	We are attempting, in this question to gain detailed data on people's perceptions of knowledge implementation practices and how they view the relevance of knowledge and knowledge/information gathering.	What we hope to gain from this question is data in relation to current assessment practices. It is possible that we will get a lot of information on the Garda portal, as this is promoted within the organisation as being the main "knowledge" base for the organisation. We may also get information on current crime investigation database

es and information technology initiatives. |

Question	Why do I ask	Areas that could be discussed
To what extent, and why, do you think the following factors affect knowledge in policing? Please elaborate. Education Experience Training IT Literacy Business Communications Business Process Interactions Personal Network Performance Innovation	We need to ascertain the relevance, place, practicalities and position of individual knowledge in a policing context. We need to ascertain how individuals can create, retain, store and share knowledge.	We hope to hear about individual expertise, knowledge assimilation, knowledge hoarding, knowledge sharing and how best it can work in a collaborative context. We also hope to elicit information on current knowledge sharing practices and how knowledge is held and shared in AGS.

Appendix 14 Interview Schedule and Rationale

	A	B	C	D
1	**Garda Interview Schedule**			
2				
3	**Position / Title**	**Section**	**Name**	**Reason for Interview**
4	Commissioner of An Garda Síoc	Commissioner's Office, Garda HQ.	Commissioner	To elicit top management perspective on knowledge management in AGS, it's potential, relevance and possible inculcation into organisational culture and consciousness
5	Deputy Commissioner. Governance and Strategy	Deputy Commissioner's Office, Garda HQ.	Commissioner	To ascertain the effectiveness of KM initiatives in AGS and possible relevance to strategic initiatives. To investigate the merits of Knowledge assimilation and dissemination and the current levels of expertise in various roles throughout AGS
6	Assistant Commissioner, Dublin Metropolitan Region	Garda Hq, Harcourt Square.	Commissioner	To investigate the possible / potential effects of KM in the area of front line policing. To discuss the possible uses for knowledge and knowledge sharing, and to ascertain the relevance of identifying knowledge holders.
7	Chief Superintendent, Anglesea Street	Anglesea St Garda Station, Anglesea Street, Cork.	Chief Superintendent	To ascertain the relevance of knowledge and knowledge management initiatives in a regional frontline operational setting.
8	Superintendent I/C, Garda I.T Section	Garda Hq.	Superintendent	To analyse the relevance of codified knowledge and knowledge initiatives. To investigate the propensity of KM to aid in the investigation process and to highlight the essential differences / commonalities between the data, information and knowledge
9	Inspector I/C Court Service,	Bridewell Garda Station	Inspctor	To ascertain the relevance / effect of knowledge management and its potential to aid in legislative processes and procedures
10	Sgt I/C Traffic Corps	Garda Traffic Corps. Dublin Castle	Sgt	To investigate the possible relevance of KM to front line policing. To ascertain the role and potential of knowledge portals, personnel and procedures to the policing process.

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11	Members of Garda rank x 3 (names to be confirmed)	Store St Garda Station. Co. Dublin Killarney Garda Station, Co. Kerry Dundrum Garda Station. Co. Dublin Maynooth Garda Station. Co. Kildare	x 4	To ascertain the relevance and potential of knowledge management, knowledge sharing initiatives, and knowledge collaboration for front line police officers in three diverse police locations. The busiest police station in the country, a rural police station, and a police station that straddles the boundary between the two.
12	Inspector I/C Command and Control	Garda Hq, Harcourt Square	Inspector	To look the role of communication and information in the emergency despatch centre and see how knowledge could be situated at increasing efficiency
13	Inspector I/C Telecommunications	Garda Hq.	Inspector	To look at the role of telecommunications and networking infrastrucutre in AGS and the potential benefits of managing knowledge in this context
14	Chief Superintendent, Garda Technical Bureau	Garda Hq.	Chief Superintendent	To look at the roles of specific experts in areas of crime investigation, such as fingerprints, ballistics, etc, and ascertain the relevance of expertise within AGS through these roles
15	Superintendent, Office of the Deputy Commissioner, Governance and Strategy. (Administrator of the Garda Siochana Portal)	Garda HQ.	Superintendent	To ascertain the role of the Garda Siochana portal in the delivery of information and knowledge via the electronic portal in use in the organisation at present
16	Chief Superintendent, An Garda Síochana College	Templemore, Co. Tipperary	Superintendent	To ascertain the extent and relevance of knowledge management initiatives in the training programmes in AGS and to discuss the possibility of introducing same.

17	Executive Director HRM (Civilian Staff)	Garda HQ	Mr A.M	To ascertain the relevance of knowledge management to HR strategies particularly in relation to new entrants and departing employees. Knowledge transfer and sharing would also be of significant interest and relevance to HR strategies.
18	Executive Director of Strategic Transformation	STO Office, Navan Road	Mr. D.G	To investigate the possible inculcation of knowledge management strategies and the identification of knowledge roles and processes within the organisation as it moves forward.
19	Executive Director of Finance and Services	Garda HQ	Mr. M.C	To investigate the level of expenditure on new initiatives in the organisation and what, if any, financial resources could be devoted to information and knowledge initiatives.
20	Head of Garda Internal Analysis Section	Garda HQ	Dr. G.S / Dr. M.W	To investigate the statistics with regard to effectiveness across investigation processes in AGS. To ascertain if knowledge and knowledge management can play a role in this area and if the identification of knowledge as an organisational asset can assist in reporting and analysis processes
21	Head of Forensic Science	Garda HQ	Dr. C.E	To ascertain the potential of knowledge management in the investigation of crime and to investigate the potential of collaborative ventures across similar organisations, particularly with regard to areas such as communities of practice
22	Higher Executive Officer	Garda Press Office , Garda HQ	Ms. J.G	To investigate the role of information dissemination in AGS and to ascertain if it is an area in which knowledge management can be of benefit

23	Clerical / Executive Officer	Garda station Pearse St	Ms. L.W	To investigate the possible advantage of KM in administrative duties and how it could be of benefit in bridging the gap between administrative and policing roles.
24	Politician (Public Accounts Committee)	Constituency Offices	Councillor C.M	To analyse the role that governmental mandate and accountability have to play in An Garda Síochana, and how it pertains to a new era of change in the way the organisation operates.
25	Chief Administrative Officer	Garda HQ	Mr. J.N	To Assess the role and effectiveness of most senior Civilian role in the organisation. And what changes the office can bring to the processes and procedures.
26	Inspector I/C Commissioner's Office	Garda HQ	Inspector	Toassess the role of knowledge and knowledge management from the perspective of a junior manager who operates in both administrative and opeational environments

Appendix 15 Data Procurement Process
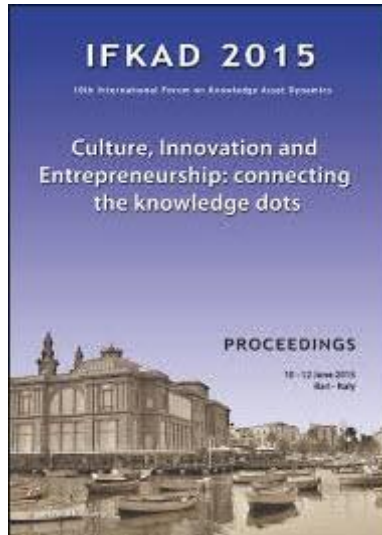
A Review of Knowledge Management in the Public Sector: A Taxonomy

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Review on the KM Applications in Public Organisations

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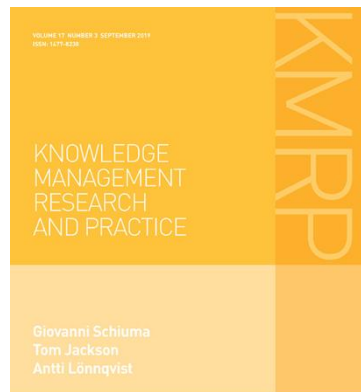# Review on the KM Applications in Public Organisations

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