Research Proposal
for the Award of
Doctor of Philosophy
(Communication Specialisation)

A Knowledge Productivity Model
for the Public-Sector

by

Graham Durant-Law

BSc, MHA, MKM, Grad Dip Def, Grad Dip Mngt, Grad Cert Hlth Fin, psc.

Student Identification Number: 118254

A research proposal presented to Associate Professor Trish Milne and Mr Tony Eccleston, Division of Communication and Education, the University of Canberra, on the 28th of January 2006.
Statement of original authorship

This proposal to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference is made in the text of the paper.

Signed

Graham Durant-Law

28th of January 2006

Copyright statement

This work is copyright ©. Apart, from any use as allowed under the Copyright Act 1968, no part may be reproduced in whole or part, by photocopy or by any process, without the written permission from Graham Durant-Law, which may be obtained from graham@durantlaw.info.
Abstract

This proposal outlines a research project entitled ‘A Knowledge Productivity Model for the Public-Sector.’ The research will occur in a public-sector organisation in Canberra. The specific problem to be addressed is ‘How can public-sector organisations enable knowledge for improved productivity and positive exploitation?’ Therefore the aim of the research is to document what knowledge means for a public-sector organisation. The research will produce a theory and model of knowledge productivity, including a means of measuring knowledge productivity. The research objectives will be achieved using a hybrid qualitative methodology based on Checkland’s soft systems methodology, and Strauss and Corbins’ version of grounded theory.
# Table of Contents

Section 1  
Context for the Research............................................................................. 1
  1.1  Section introduction.............................................................................. 1
  1.2  Research motivation and desired outcome........................................ 3
  1.3  Research aim, problem, and working title........................................ 4

Section 2  
A Preliminary Literature Review................................................................ 5
  2.1  Section introduction.............................................................................. 5
  2.2  What is knowledge? .............................................................................. 6
    2.2.1  Truth types...................................................................................... 7
    2.2.2  True beliefs..................................................................................... 8
    2.2.3  The definitional conundrum........................................................... 9
    2.2.4  An epistemologist’s view of knowledge........................................ 10
    2.2.5  Knowledge management theorist’s views on knowledge............. 12
    2.2.6  The definitional conundrum revisited.......................................... 14
  2.3  A working definition of knowledge..................................................... 15
  2.4  What are the existing models of knowledge management?................. 16
    2.4.1  What is a model?............................................................................ 16
    2.4.2  Knowledge management models................................................ 17
    2.4.3  Knowledge management standards and guides.......................... 18
    2.4.4  Integrative knowledge management models............................... 19
  2.5  Section conclusion................................................................................. 20

Section 3  
Justification for the Research..................................................................... 21
  3.1  Primary justifications.......................................................................... 21
  3.2  Other justifications.............................................................................. 22

Section 4  
Methodological Foundations....................................................................... 24
  4.1  Philosophical posture.......................................................................... 24
  4.2  Proposed methodology....................................................................... 24
    4.2.1  Soft systems methodology......................................................... 25
    4.2.2  Grounded theory.......................................................................... 27
    4.2.3  Justification for a hybrid methodology....................................... 30
    4.2.4  Methodological limitations......................................................... 32
  4.3  Section Conclusion.............................................................................. 32

Section 5  
Methods and Approach.............................................................................. 34
  5.1  Assumptions, propositions and primary research questions............... 34
  5.2  Research locations............................................................................. 35
  5.3  Research strategy............................................................................... 35
  5.4  Research design................................................................................. 38

Copyright © Graham Durant-Law 2006
5.4.1 Step 1: Present the research proposal seminar ................................................................. 38
5.4.2 Step 2: Gain approvals and permissions ........................................................................... 38
5.4.3 Step 3: Design the research instruments .......................................................................... 39
5.4.4 Step 4: Conduct a pilot study ............................................................................................ 39
5.4.5 Step 5: Refine the research instruments and methods ......................................................... 40
5.4.6 Step 6: Conduct the first organisation-wide survey .............................................................. 40
5.4.7 Step 7: Do the initial data analysis ..................................................................................... 42
5.4.8 Step 8: Lead the initial focus group .................................................................................. 43
5.4.9 Step 9: Do the second data analysis ................................................................................ 45
5.4.10 Step 10: Conduct semi-structured interviews ................................................................. 45
5.4.11 Step 11: Do the third data analysis .................................................................................. 46
5.4.12 Step 12: Develop a conceptual model and initial theory .................................................. 46
5.4.13 Step 13: Lead the second focus group .......................................................................... 47
5.4.14 Step 14: Design the second organisation-wide survey ...................................................... 48
5.4.15 Step 15: Conduct the second organisation-wide survey .................................................. 48
5.4.16 Step 16: Do the final data analysis .................................................................................. 48
5.4.17 Step 17: Develop the substantive theory and model ....................................................... 49
5.4.18 Step 18: Write the organisation report ............................................................................. 49
5.4.19 Step 19: Write the thesis .................................................................................................. 50
5.4.20 Step 20: Submit the thesis for examination ..................................................................... 52

5.5 Ethical considerations ........................................................................................................... 52

5.6 Research design limitations .................................................................................................. 54

5.7 Section Conclusion ................................................................................................................. 54

Section 6 Administrative Matters .................................................................................................. 55

6.1 Budget and resources .......................................................................................................... 55
6.2 Timetable ............................................................................................................................... 56
6.3 Risks and risk mitigation ....................................................................................................... 60
6.4 Record management .............................................................................................................. 61

Section 7 Conclusion ..................................................................................................................... 62
List of Appendices

Appendix 1  Research Mind Map .......................................................... 63
Appendix 2  Output from NetMiner® ...................................................... 64
Appendix 3  Output from Semantica® ...................................................... 65
Appendix 4  Output from CmapTools® .................................................... 66
Appendix 5  Outline Thesis Structure .................................................... 67
Appendix 6  Initial Draft Ethics Approval .............................................. 68
Appendix 7  Draft Consent Form .......................................................... 85
Appendix 8  Draft Management Disclosure Contract ............................. 90
Appendix 9  References ..................................................................... 92

List of Figures

Figure 1: Checkland’s soft systems methodology .................................. 26
Figure 2: The general steps in grounded theory ..................................... 28
Figure 3: The research design phases and steps ..................................... 37
Figure 4: Phase one timeline ............................................................... 57
Figure 5: Phase two timeline ............................................................... 58
Figure 6: Phase three timeline ............................................................. 59
Figure 7: Research mind map .............................................................. 63
Figure 8: Output from NetMiner® (produced from researcher’s experimental data) .................................................. 64
Figure 9: Output from Semantica® (produced from researcher’s experimental data) .................................................. 65
Figure 10: Output from CmapTools® (accessed from http://cmap.ihmc.us/) .......................................................... 66
Figure 11: Outline thesis structure ....................................................... 67

List of Tables

Table 1: A comparison of soft systems methodology and grounded theory .................................................. 31
Table 2: Proposed thesis structure and writing time .................................. 50
Table 3: Indicative budget .................................................................. 55
Section 1  Context for the Research

‘The most critical element of corporate strategy is to conceptualise a vision about what kind of knowledge should be developed and to operationalise it into a management system for implementation’.

Ikujiro Nonaka and Hirotaka Takeuchi – Knowledge Management Academics

1.1 Section introduction

Legend has it that General George Patton once said, “I don’t know what this logistic stuff is all about, but I sure as hell want some!” Knowledge management is the same – everybody wants some. Indeed, in the past decade or so there has been an burgeoning interest in academic and business circles in knowledge management (Loermans & Fink 2005). The central theme is that we are now in the ‘knowledge age’ (Drucker, Peter. 1993, p. 344) and the new economy is based on knowledge exploitation1 (Kermally 1997, p. 220). Knowledge exploitation, so the argument goes, is concerned with capturing existing knowledge and creating new knowledge for commercial advantage (Oshri, Pan & Newell 2005; Probert 2003, p. 63).

The other striking feature of this interest in knowledge management is the diversity and interdisciplinary nature of the field itself, and the consequent lack of a universal lexicon (Handzic & Hasan 2003, p. 3; Leitch 2005). Indeed, the knowledge management literature provides many definitions of knowledge, most of which build the concept from data, to information, and then to knowledge. Some of the literature even takes this one step further and expands knowledge to understanding and wisdom (see for example, Ackoff 1989; Kannegieter 2001; Stewart 1999); however there is little agreement for a precise definition of knowledge (Biggam 2001, p. 2; Håkanson 2001, p. 3). Data and

1 The word ‘exploitation’ is used in the sense of turning something into practical account, rather than the more negative meaning of selfish use for one's own ends.
information are often used interchangeably, and information and knowledge are used as synonyms.

It becomes even more confusing when knowledge typologies are introduced. These typologies include the differentiation between tacit, implicit, and explicit knowledge (Nickols 2000); a divide into human, social, and structured knowledge (De Long & Fahey 2000); and partitioning knowledge into declarative, procedural, and strategic knowledge (Nickols 2000). Two other typologies separate knowledge into the ‘know what’, the ‘know how’, the ‘know why’, the ‘know who’, the ‘know where’, and the ‘know when’ (Lundvall & Johnson 1994; Yoshioka et al. 2003), and ‘embrained’, ‘embodied’, ‘encultured’, ‘embedded’ and ‘encoded’ (Blacker 2002).

From this uncertain foundation various knowledge management models, such as Nonaka and Takeuchi’s ‘SECI Knowledge Spiral’ (Nonaka, I. & Takeuchi 2004), and Firestone and McElroy’s ‘Knowledge Life Cycle’ (Firestone, Joseph & McElroy 2003), have been touted in the marketplace as the solution to an enterprise’s problems. Each of these models has a different approach and begins with a differing set of assumptions. For example Nonaka and Takeuchi’s ‘SECI Knowledge Spiral’ has a justified true belief premise, while Firestone and McElroy’s ‘Knowledge Life Cycle’ uses a Popperian framework.

Further there appears to be no models published in the literature that provide complete real-world examples that firstly illustrate the ‘knowledge process’ from end to end, and then explain, rather than describe, how it works. This makes it difficult to evaluate the models, let alone decide their utility in the business world. In addition, where examples are provided most models focus on commercial enterprises rather than public-sector organisations. In truth, most of the models in the literature are actually ‘models of knowledge’ rather than ‘knowledge management models’, which explains why they are so
difficult to operationalise\textsuperscript{2}. Also, a critical examination of the literature reveals that much of it is evangelistic and relies on a ‘business guru’ to justify its contention.

How then does an enterprise engage in ‘knowledge exploitation,’ and evaluate the utility of the various knowledge management models, given there is no agreed definition of knowledge? Plainly there is a need to return to first principles and work out what knowledge truly is for an organisation, and what it really means to manage knowledge. Recently this has been recognised to some extent with pleas for research that provides an empirical basis for the argument (see for example Bouthillier & Shearer 2002; Edwards et al. 2003; Patriotta 2003).

\subsection*{1.2 \textit{Research motivation and desired outcome}}

The central idea underlying this research is that knowledge itself cannot be managed, but if organisations unite their holons (Koestler 1967)\textsuperscript{3} with a common purpose and focus on individual and organisational productivity, knowledge is enabled. Therefore the motivation for this research is to provide an empirical basis from which a model of knowledge productivity\textsuperscript{4} for a public-sector organisation can be developed. The expected outcome is to produce a model of knowledge productivity that can be applied with little modification anywhere in the public-sector, and possibly in the commercial-sector.

\footnotesize
\begin{itemize}
  \item The distinction between ‘\textit{models of knowledge}’ and ‘\textit{knowledge management models}’ is discussed in Section Two of this paper. The distinction is a crucial concept for this research.
  \item Koestler is usually credited with the idea of the holon. A holon is an identifiable part of a system, or a system in its own right, which has a unique identity yet is made up of subordinate parts and in turn is part of a larger whole. A holon exhibits both autonomous and cooperative behaviour, and can combine to form another holon, thus forming a hierarchy called a holarchy.
  \item Knowledge can be conceived as being a product – that is, it is a thing produced by action. Productivity is a measure of efficiency of production, which implies a comparison of input with output. Knowledge productivity is therefore the purposeful, deliberate, and conscious action of creating, applying, organising, and measuring knowledge.
\end{itemize}
1.3 Research aim, problem, and working title

The aim of this research is to document what knowledge means for a Canberra-based public-sector organisation, so a theory and model of knowledge productivity, including a means for measurement, can be developed.

The specific problem to be addressed is ‘How can public-sector organisations enable knowledge for improved productivity and positive exploitation?

The proposed working title is ‘A Knowledge Productivity Model for the Public-Sector.’

A mind map of the proposed research is presented at Figure 7 in Appendix 1.

To inform the research, literature from the disciplines of epistemology, management theory, public-sector management, policy development, systems thinking, systems engineering, chaos theory, network theory, change management, project management, and of course knowledge management, will be examined. A preliminary and embryonic literature review is presented in the next section.
Section 2 A Preliminary Literature Review

‘Knowledge is of two kinds. We know a subject ourselves, or we know where we can find information upon it’.

Samuel Johnson - English Lexicographer (Partington 1996, p. 374)

2.1 Section introduction

Given the research aim and the problem to be addressed, the literature review to be presented in the final thesis must include discussions on:

- What is knowledge?
- What is a knowledge worker?
- Who in the organisation is a knowledge worker?
- What is worker productivity?
- What is knowledge productivity?
- What is knowledge management?
- What are the existing models of knowledge management? and
- How are knowledge management initiatives measured?

However, at this very early stage of the research only the questions – ‘What is knowledge?’ and ‘What are the existing models of knowledge management?’ – have been addressed in any detail, and even these are far from complete. The reason for this is that the researcher intends to employ a hybrid methodology based on Checkland’s soft systems methodology (Checkland 1993a, 1993b; Checkland 1999; Checkland & Scholes 1990) and Strauss and Corbins’ version of grounded theory (see Strauss & Corbin 1998). The use of literature and how extensive the initial literature review is are areas of
significant contention for this type of methodology, and particularly for grounded theory. Indeed Goulding (1999, pp. 868-9) recommends that:

‘... during the early stages of the study the researcher should avoid steeping him/herself too heavily in the finding of others, as this will form certain expectations of outcomes and will potentially influence what to look for.’

Instead the emergent theory should guide the researcher to the literature that assists in contextualising, explaining and informing the research (Goulding 1998, p. 51).

Notwithstanding these comments it is necessary to have some idea of what the literature says about knowledge given that knowledge is the central theme of the research. For the same reason it is also necessary to make the distinction between models of knowledge and knowledge management models.

2.2 What is knowledge?

Knowledge is one of those content-free management words that has many meanings (Assudani 2005). In fact the Macquarie Dictionary provides eight definitions of knowledge. The first says knowledge is ‘acquaintance with facts, truths, or principles, from study or investigation.’ Another says knowledge is the ‘perception of fact and truth and being cognisant or aware of fact or circumstance.’ The last definition says knowledge is the ‘body of truths or facts accumulated by human beings in the course of time’ (The Megalex Macquarie Dictionary 2002). From these definitions the deduction can be made that in order to have knowledge one must first have some facts.

The same dictionary provides three definitions of a fact. The first says a fact is something that ‘has really happened or is the case.’ The second says a fact is a ‘truth known by actual experience or observation’, and the last muddies the waters by saying a fact is ‘something said to be true or supposed to have happened’ (The Megalex Macquarie Dictionary 2002). The linking concept is truth, but what is truth?
2.2.1 Truth types

The Prussia philosopher Immanuel Kant held that there were two types of truth – analytic truths and synthetic truths. Analytic truths are statements whose denial leads to a contradiction (Horner & Westacott 2000, p. 21). For example, the assertion that ‘all mothers are female’ is an analytic truth because all mothers can be defined as a female parent. To deny the statement that ‘all mothers are female’ results in the absurd assertion that not all female parents are female. This truth is derived simply by analysing the subject term in the statement. According to Kant analytic truths are both necessarily true and universally true. By this he meant that the truth cannot be conceived in any other way, and that the truth has a law-like generality with no exceptions (Horner & Westacott 2000, p. 23). Analytic truths represent knowledge because they are undeniable facts.

On the other hand synthetic truths are statements that are true but can be denied without creating a contradiction (Horner & Westacott 2000, p. 21). For example the statement ‘most human mothers are over twelve years old’ is a synthetic truth because it contains two unrelated concepts – the concept of being over twelve years old, and the notion of being a human mother. The statement is known to be true on the basis of experience, and not simply by understanding the meanings of the words. It is not inconceivable for there to be a nine year old human mother, but from experience most people would agree this is most unusual. Indeed, if the statement were changed to ‘most human mothers are over nine years old’ it would remain a synthetic truth.

If on the other hand the statement was changed to ‘all human mothers are over nine years old’ a degree of fuzziness would be introduced to the argument. There is now an absolute statement that is understood to be generally true, and which many would believe to be true. So in what circumstances is the belief a truth, and when does a truth constitute knowledge? This is where the notion of ‘true belief’, and particularly ‘justified true belief’ and ‘appropriately caused true belief’, enters the debate.
2.2.2 True beliefs

Beliefs are something that an individual holds to be true. They are facts that are derived from either analytic or synthetic truths, or some other source such as an authoritative reference or person. The dictionary definition of knowledge says it consists of facts and truths. The preceding discussion just determined that a belief is something that is held to be true, in other words a belief is a truth; yet it is possible to hold a mistaken belief – that is someone can believe something to be true when in fact it is false. Clearly then a mistaken belief should not be considered to be knowledge. But what is the test to determine whether a belief is true or otherwise?

Philosophers test their arguments using a conditional equation where $S$ is a person and $p$ is a proposition. According to this philosophical approach belief becomes knowledge if, and only if, the following conditions are met:

- $p$ is true, and
- $S$ believes that $p$ is true.

The first condition requires something to be true, and that someone cannot know that it is true if in fact it is false. In this sense the condition is absolute. The second condition requires that the person is actually aware of the proposition and believes it to be true. However clearly it is possible to have a mistaken belief; therefore the equation requires an additional statement. Philosophers who subscribe to the notion of justified true belief change the equation to:

- $p$ is true, and
- $S$ believes that $p$ is true, and
- $S$ has adequate justification for believing that $p$ is true.

The final condition requires justification for the belief (Everitt & Fisher 1995, pp. 12-9). But this still leaves a problem because the justification for the belief could be wrong resulting in the justified true belief being false and hence the failure to end up with
knowledge. Such a situation might arise because the source of much of what is known is the written or spoken word, and these written or spoken words may be factually incorrect despite the belief that the source is authoritative. Some philosophers have tried to resolve the justified true belief problem by linking knowledge to causality. This changes the equation to:

\[ p \text{ is true} \]

\[ S \text{ believes that } p \text{ is true, and} \]

What \( p \) is about is causally connected in an appropriate way to \( S \)'s belief that \( p \) is true \cite{EverittFisher95}.

It means that to distinguish knowledge from beliefs and opinions the key is not justification, but rather the causal connections. At first blush this appears to solve the problem, but it does not account for situations where something is known but the ‘knowing’ is not caused by the thing. For example someone can know that 13 is a prime number, perhaps because they have been told this by an authoritative mathematician, or perhaps by using the prime number theorem to work it out for themselves. In both cases, however, it is not the number 13 itself that causes them to know it is a prime number \cite{EverittFisher95}.

### 2.2.3 The definitional conundrum

Clearly it is extraordinarily difficult to define what a true belief is, and provide a test that accounts for all possibilities. This deficiency makes the definition of truth incomplete, resulting in an inability to precisely define knowledge, and leaves a definitional conundrum. It is perhaps better, therefore, to look at what has been established.

The dictionary definition says that knowledge is ‘body of truths or facts accumulated by human beings in the course of time’, and that a fact is ‘something said to be true or supposed to have happened’ \cite{MegalexMacquarie}. From this it can safely be determined that truth is a universally agreed component of knowledge. It is also understood that truth can be broken into analytic and synthetic truths with the former
being an absolute fact, and the later being based on a true belief. What is unable to be defined is what a true belief is, and this leaves a conundrum – knowledge can be whatever one believes it to be! It should also be noted that it is not possible for a belief to exist as such independently of a sentient being, meaning that knowledge cannot exist outside of a human. This really does pose a conundrum! David Snowden, the former director of IBM’s Global Services Knowledge and Differentiation Business Unit, suggests to solve this conundrum one should first turn to the philosophical discipline of epistemology (Snowden 1999, p. 63).

2.2.4 An epistemologist’s view of knowledge

Epistemology is concerned with the ‘theory of knowledge’, and has a history in the Western world dating to the works of Plato and Aristotle. The word epistemology is derived from the Greek words episteme, meaning knowledge, and logos, meaning rational explanation (Horner & Westacott 2000, p. 28). Epistemology seeks to define a standard of evidence for the justification of beliefs and an understanding of how something can be known (Audi 2000, p. i), and in this sense is a regulative discipline (Probert 2003, p. 63).

Traditional epistemology seeks to answer eight questions (Everitt & Fisher 1995, pp. 1-11). These are:

- **What is knowledge?**
- **What kinds of knowledge are there?**
- **What are the sources of knowledge?**
- **What is the structure of the body of knowledge?**
- **What are the limits of what can be known?**
- **What are the mechanisms by which one gains knowledge?**
- **How is knowledge related to belief and justification?** and
- **How ought one to proceed in order to acquire knowledge?**
Epistemology therefore offers the promise to solve part of the manager’s conundrum to determine what the knowledge component in the various knowledge management models actually is. If nothing else an epistemological examination of the firm should allow the manager to determine its belief basis, and therefore to develop a shared understanding of what knowledge means to the organisation.

Epistemologists typically make a major distinction between empirical knowledge, and *a priori* knowledge. *A priori* knowledge is said to be gained by reason alone (Everitt & Fisher 1995, p. 2). *A priori* knowledge consists of statements that are known to be true without consulting one’s experience and therefore comprises analytic truths (Horner & Westacott 2000, p. 23). On the other hand, empirical knowledge, or *a posteriori* knowledge, is usually thought of as being knowledge that is derivable from experience or the senses alone (Everitt & Fisher 1995, p. 2). Empirical knowledge therefore does not contain analytic truths, but rather truths that have been derived from observation, experimentation, collecting evidence, and so on (Horner & Westacott 2000, p. 23).

Some epistemologists also make a distinction between capacity knowledge, acquaintance knowledge, and propositional knowledge. Capacity knowledge is knowledge on how to do something (Everitt & Fisher 1995, p. 12). It is both cognitive and actionable. An example of capacity knowledge is knowing how to swim or to use Microsoft® Word 2003. Acquaintance knowledge is knowing something by personal acquaintance in space and time (Everitt & Fisher 1995, p. 13). For example, one can say that they know Tony Eccleston, and that they know he is a lecturer at Canberra University and a former naval officer. Propositional knowledge deals with true or false situations. To be propositional knowledge something is either true or false. For example, the statement ‘*one plus one equals two*’ is true, and the statement ‘*one plus one equals three*’ is false. The first statement is known to be true and the second to be false hence one has knowledge - in this example based on an analytic truth.

Based on the definitions outlined immediately above, epistemologists broadly fit into three schools. The first school is the autopoietic school. This school’s position is that knowledge belongs to individuals since information, which is mere data in context, needs to be interpreted according to the individual’s internal mental model. This means that
knowledge is extremely difficult if not impossible to transfer. The second school might be called the cognitivists. This school focuses on the collection and central dissemination of knowledge as the main knowledge development activity. In this school knowledge might be considered to be facts and is based on the philosopher’s argument of ‘justified true beliefs.’ The last school is the connectivists who believe that knowledge can and does reside in the team, and in the interactions within the team, therefore communication and the flow of information is the focus of knowledge management.

2.2.5 Knowledge management theorist’s views on knowledge

Knowledge management practitioners generally reside in either the cognitive or connectivist school. They are usually happy with a much looser definition of knowledge than an epistemologist, and tend to focus on the generative rather than regulative aspects. That said, regardless of their school, knowledge management practitioners characteristically make a distinction between data, information and knowledge.

Data are typically thought of as being ‘a set of discrete, objective facts existing in symbolic form that have not been interpreted’ (Davenport & Prusak 1998, pp. 2-3), but which can be ‘shaped and formed to create information’ (Laudon & Laudon 1998, p. 16). The symbolic form may be text, images, or pre-processed code, and are the products of observations made by humans or instruments (Ackoff 1996, p. 28). Data are usually organised into structured records, however data lacks a complete context. The declaration ‘Iron melts at 1,535 degrees Celsius.’ is therefore a datum statement because it has little context.

According to knowledge management theorists when data is enriched by adding context it may become information. Information is simply data ‘in formation’ (Brown & Duguid 2002, p. 138), which has ‘been shaped by humans into a meaningful and useful form’

---

5 The terms knowledge management theorist and knowledge management practitioner are used interchangeably throughout this paper. In both cases the terms mean someone that purports to practice knowledge management.
(Laudon & Laudon 1998, p. 16). It is data with a message, and therefore has a receiver and sender. It is data with relevance and purpose that is useful for a particular task (Liebowitz & Beckman 1998), and is meant to enlighten the receiver and shape their outlooks or insights (Davenport & Prusak 1998).

Information results in an action that allows data to be applied to a specific set of circumstances and to be employed effectively, therefore, data only becomes information after the receiver has interpreted it. Furthermore information is descriptive. The statement ‘Newcastle steel-mill’s smelter temperature has been set at 2,300 degrees Celsius.’ conveys information because it has been enriched by context. The enrichment from data to information is a ‘know what’ procedure (Ackoff 1996, p. 28) that results in an understanding of relationships and patterns. However, information by itself remains descriptive and without additional data or information it cannot be used to predict an event or outcome.

Information only becomes knowledge after it has been examined and compared to other information or data, and is then applied to describe, predict or adapt to a situation (Kock, McQueen & Corner 1997, p. 70). A 'know how and why’ enrichment occurs with the addition of further context, experience and understanding, to result in an understanding of principles. The statement ‘If the steel-mill’s smelter temperature is set at 2,300 degrees Celsius, then all the iron in the smelter will melt in 30 minutes.’ represents knowledge, because it is both predictive and descriptive, has context, and demonstrates understanding.

Knowledge management theorists typically delineate between tacit and explicit knowledge. Definitions in the knowledge management literature of tacit knowledge include:

‘that which is used by all people but not necessarily able to be easily articulated’ (Polanyi 1966, p. 4);

‘understanding gained by people through selective categorisation of their world view, which, once established changes slowly over time to form the foundation for new knowledge’ (Ehin 2000, p. 108);
'the understanding held by an individual that is derived from the integration of values, perceptions, opinions and personal beliefs with experience and information, which allows it to be employed effectively’ (Nonaka, I. & Konno 2000); and

‘personal context-specific knowledge that is difficult to formalise, record, or articulate’ (Tiwana 2002, p. 44).

The Macquarie Dictionary defines explicit as being something that it is definitive, clearly developed or formulated, and leaving nothing to be implied (The Megalex Macquarie Dictionary 2002). Explicit knowledge is codified, clearly articulated, making it available to all and sundry, and in this sense it is public knowledge. Tiwana (2002, p. 45) defines explicit knowledge as ‘that component of knowledge that can be codified and transmitted in a systematic and formal language: documents, databases, webs, e-mails, charts, etc’. Awad and Ghaziri (2004, p. 47) say that ‘explicit knowledge is knowledge codified and digitised in books, documents, reports, white papers, spreadsheets, memos, training courses and the like’.

2.2.6 The definitional conundrum revisited

From these definitions it can be safely concluded that explicit knowledge exists as an artefact, and tacit knowledge is some sort of understanding that is difficult to articulate, but is based on beliefs. But at this point there is still a conundrum. To an epistemologist a fact represents a truth, and a truth in some cases is knowledge. It follows therefore that data, as defined earlier, can actually be knowledge, and the same can be said for information. On the other hand the knowledge management practitioner’s definition of explicit knowledge is less than useful because explicit knowledge is an artefact which actually means it is datum, or at best information!

The problem lies in the artificial split into tacit and explicit knowledge by knowledge practitioners. It is instructive to return to source writings. Michael Polanyi is usually credited with developing the theory of tacit and explicit knowledge. He believed that knowledge was both individually and collectively formed in a constant cycle between personal tacit knowledge and public explicit knowledge, but that all public explicit knowledge has a tacit dimension – that is public explicit knowledge is at once both tacit
and explicit and based in individual experience (Polanyi 1966). Similarly Nonaka and Takeuchi are widely quoted in the literature however much of their work has been misquoted, or incompletely quoted. In particular they distinguish between two types of tacit knowledge – the technical and cognitive. Furthermore they say that ‘Knowledge is not either explicit or tacit. Knowledge is both explicit and tacit’ (Takeuchi & Nonaka 2004, p. 4 [the researcher's underlining]).

As soon as one accepts that knowledge is at once both tacit and explicit, and public and private, it is possible to reconcile the epistemologist’s position with the knowledge management practitioner’s. The epistemologist’s various positions (that knowledge belongs to individuals since information needs to be interpreted according to the individual’s internal mental model, or that knowledge is justified true beliefs which can manifest as social values and reside in a team) all sit comfortably with the knowledge practitioner’s data, information, knowledge divide, providing that one accepts that knowledge can only be generated in a human mind and is not instantly transferable (Kluge, Stein & Licht 2001, p. 107). Knowledge necessarily entails a ‘knower’ (Brown & Duguid 2002, pp. 119-20)

2.3 **A working definition of knowledge**

Davenport and Prusak’s definition that knowledge is a fluid mix of data, experience, practice, values, beliefs, standards, context, and expert insight that provides a conceptual arrangement for evaluating and incorporating new data, information and experiences (Davenport & Prusak 1998, p. 5) now seems reasonable, but the challenge is to actually manage a set of processes and interactions that may be inherently uncontrollable (Krogh, Ichijo & Nonaka 2000, p. vii).

At this point it is instructive to briefly review the literature on knowledge management models to see how they align with the definitions of knowledge.
2.4 **What are the existing models of knowledge management?**

This section begins with a short discussion on models, before turning to knowledge management models, knowledge management standards and guides, and integrative knowledge management models.

### 2.4.1 What is a model?

A model is an intellectual construct in artefact form that provides an abstract, highly formalised, often visual, yet simplified representation of a phenomenon and its interactions (Coffey & Atkinson 1996; Despres & Chauvel 2000). Broadly there are three types of model: mathematical models, descriptive models, and graphical models (Satzinger, Jackson & Burd 2000). Mathematical models explain the technical aspects of a system and can be either prescriptive or predictive (Miller 2006; Ragsdale 1998). Descriptive models are narrative in form and often use symbolic or mathematic elements to aid understanding. Descriptive models are rarely predictive, but can be prescriptive. Graphic models use diagrams and symbols to illustrate simple and complex relationships. They can be predictive or prescriptive.

Typically a model only includes those variables that are sufficient to represent the phenomena in question. For example if colour is irrelevant then the model will not, and should not, include it as a variable. However these simplifications may result in prediction and description errors if not considered carefully. Accordingly all models should be treated with caution. They are useful so long as the underlying assumptions are explicit, and it is recognised that they are an abstract representation of reality that may, or may not, be objective (McAdam & McCready 1999, p. 94).

---

6 An integrative knowledge management model is an actionable model that integrates theory with practice to produce a series of steps that are iterative, linear or cyclical.
Models in the social sciences tend to be descriptive and graphical rather than mathematical, although mathematical models have their place. In the knowledge management literature almost all models are descriptive and graphical. Indeed, Lee and Ahn’s (2005) model is one of the few examples of an attempt to build a knowledge management mathematical model.

2.4.2 Knowledge management models

If ‘knowledge management model’ is typed into Google Scholar 237 hits are returned. On the other hand if ‘model of knowledge’ is typed into Google Scholar 4,077 hits are returned. A reading of these articles, which includes recognised journals and grey literature, reveals that the literature is highly theoretical or deals with a loose and unstructured toolbox of techniques. Even some of these tools, such as communities of practice, have more of a theoretical flavour than a direct practical application.

Of all the hits in both categories only seven dealt specifically with knowledge management models – that is they were descriptive or graphical and had at least a hint of prescription so that a manager could actually implement them. Even these models provided no concrete guidance beyond implementation about how the knowledge management initiative would be maintained or sustained. The remaining hits were high level models of knowledge lifecycles or knowledge generation. Many built upon or incorporated Nonaka and Takeuchi’s ‘SECI Knowledge Spiral’ (Nonaka, I. & Takeuchi 2004). Others were derivatives of Ackoff’s ‘Pyramid to Wisdom’ (Ackoff 1989, 1996), and still others were the ‘Six Knows’ 7 in one guise or another. Indeed Suh, Sohn and Kwak (2004, p. 6) make the point that:

> While the importance of KM is safely established, the received literature has yet to provide an integrative model of various factors associated with KM activities. … At the risk of oversimplification, generic knowledge models typically focus on KM from knowledge life cycle perspectives. These models are important in enriching our understandings on the essentials of KM

7 The Six Knows are: know what, know how, know why, know who, know where, and know when.
activities; yet do not provide an integrative perspective for actual KM implementation’.

This point is important because it explains why the models are so difficult to operationalise, and why so many knowledge management initiatives fail. It also supports the researcher’s contention that most of the models in the literature are actually ‘models of knowledge’ rather than ‘knowledge management models’.

2.4.3 Knowledge management standards and guides

The Macquarie Dictionary provides several definition of a standard, including:

- ‘an approved model’ or ‘an authorised exemplar’;
- ‘a prescribed degree of fineness or level of excellence’; and
- ‘of recognised excellence or established authority’ (The Megalex Macquarie Dictionary 2002).

An examination of the ‘standards’ published by Standards Australia International and the European Committee for Standardisation (see CEN 2004c, 2004e, 2004a, 2004b, 2004d; SAI 2005) reveals they are all guides with few or no prescriptions. The Australian Standard views the organisation as a knowledge eco-system, and the graphic model used looks like an amoeba. A map, build, operationalise cycle is recommended however no steps are provided within each part, and the operationalise phase in particular is a collection of management motherhood statements. Indeed when the Standard was presented to a public-servant knowledge manager in the Department of Defence he declared it to be ‘not worth the paper it is printed on, and of no use in my day to day job’. The newness of this standard means there is no published evidence of its application in the either the commercial world or the public-sector.

---

8 This statement is derived from a personal discussion between the researcher and the public-servant as part of both parties’ daily job, and independently of this research proposal.

Copyright © Graham Durant-Law 2006 18
On the other hand the European Committee for Standardisation approach presents a much more robust and useful approach. In particular the small-medium enterprise implementation standard (CEN 2004a) provides a five-part approach with steps within the parts, and guides for implementation that include questionnaires and web-links to various resources. The five European standards combined present an integrative model, but unfortunately there is no evidence of their application in the public-sector.

### 2.4.4 Integrative knowledge management models

Four publications that do provide an integrative perspective for a knowledge management implementation are worthy of singling out. The first is Tiwana’s (2002) book ‘The knowledge management toolkit : orchestrating IT, strategy, and knowledge platforms’. This book provides a 10-step road map to implement a knowledge management initiative, with each step being explained in detail. Unfortunately there is no evidence that this model has been applied in any one company or the public-sector.

The second is Frid’s (2002) ‘A pragmatic guide to building a knowledge management program’, and the third is Frid’s (2003) ‘A common KM framework for the Government of Canada: Frid framework for enterprise knowledge management.’ Both of these publications provide a broad five-step framework that is well explained. Each step has five management indices, which together provide a structured method to measure the knowledge management initiative. However, the researcher has been unable to locate any evidence that this model has been applied in any one company, or even the Canadian public-sector!

The fourth is the Stankosky model as published in Stankosky (2005) ‘Creating the discipline of knowledge management: the latest in university research’. This model appears to be a developing methodological framework, rather than a single model, and is the subject of continuing doctoral research at the George Washington University. Further investigation is warranted as part of the thesis literature review.
2.5 Section conclusion

From the foregoing discussion it can be concluded that epistemology is regulative – that is it seeks to prove or disprove that something is knowledge. Knowledge management theory tends to be generative – that is it tends to try to understand how knowledge is grown and fostered. Unfortunately the knowledge management discipline has focussed on the generative aspects of knowledge with little regard to the regulative aspects defined by questions like ‘What is knowledge?’ and ‘What kinds of knowledge are there?’ This is an obvious weakness in the state of the art, and has resulted in high level models that are virtually impossible to operationalise.

Humans are an essential agent for knowledge, particularly if we adopt a justified true belief position. Indeed it is wise to remember that while computers can extract data from machines, and can even find patterns that humans may take forever to find, this is simply taking data and making it into information by giving it context – it is not creating knowledge. Whether the patterns are real and useful ultimately requires understanding of relations and causalities, and when to apply or discard a rule, something that so far can only be done by a human (Martin 2000). Lewis Hassell, a philosopher at Drexel University Philadelphia, summarises this position nicely by saying that there is no knowledge outside of experience, so knowledge is always ‘embodied, and that experience is always the experience of some rational individual in society, therefore there is no such thing as disembodied knowledge’ (Hassell 2004, p. 1).

All this means that explicit knowledge, as the knowledge practitioners define it, is quite simply data and information artefacts. In turn it leads to the conclusion that knowledge cannot be managed per se, but it can be enabled – this is Nonaka and Takeuchi’s proposition from the outset (see Nonaka, I. & Takeuchi 2004; Nonaka, I., Takeuchi & Umemoto 1996), and is the underlying position of this research.
Section 3 Justification for the Research

‘Has knowledge management (KM) been done? Of course KM has been done... But whether formal interventions claiming the label KM are bona fide instances of KM practice is another matter entirely. To answer that question, we need to have clear, non-contradictory ideas about the nature of knowledge, knowledge processing and KM’ (Firestone, J 2005, p. 189).

Joseph Firestone – Knowledge Management Theorist

3.1 Primary justifications

This research has two primary justifications. Firstly, corporations and the public-sector are spending millions of dollars on knowledge management initiatives many of which fail. Indeed Storey and Barnett (2000) claim that as many as 84% of knowledge management initiatives have failed, and Chua & Lam (2005, p. 16) say that knowledge management ‘project failure is a reality that both practitioners and researchers have to reckon with’. Further Davenport and Prusak (1998, p. 1) make the point that:

‘Confusion about what data, information, and knowledge are – how they differ, what the words mean – has resulted in enormous expenditures on technology initiatives that rarely deliver what the firms spending the money needed or thought they were getting.’

This research will provide an empirical basis to assist organisations to determine what data, information and knowledge actually means for them, and in so doing should allow them to select an appropriate management intervention. In so doing it will fill a significant gap in the literature, and brings with it the promise of more efficient use of public monies by organisations utilizing the research findings.

Secondly, whilst management theory is developing quickly, knowledge management theory is still in its infancy, with little empirical research available on the application of

---

The researcher is directly involved in the design and implementation of the Australian Defence Force’s TARDIS knowledge management system. This system has cost in excess of $1.2 million to date, and a further $2.5 million over two years has recently been authorised.
theory to the workplace (Stacey 2001). Indeed Cecez-Kecmanovic (2004, p. 156) says that:

‘... practitioners do not find many applicable or useful concepts, frameworks and models. Finding a reasonably grounded and practically applicable theoretical foundation for developing, exploring, and evaluating knowledge management processes, IT applications, and KMS persists as a challenging task.’

This research will take a small step towards correcting that anomaly by providing an empirical study that assists in the development of a model of public-sector knowledge productivity, rather than a model of knowledge. The model of knowledge productivity will include implementation, maintenance and sustainment components. Further this research will contribute to the knowledge management discipline by providing a complete end to end example of a knowledge productivity intervention\(^{10}\), as well as providing a basis for a public-sector organisation to evaluate their existing knowledge management solutions. Finally, the research outcomes will provide a theoretical construct that will allow knowledge practitioners to practice with confidence (Stankosky 2005).

### 3.2 Other justifications

Less importantly the research is further justified because there is a paucity of Australian examples in the literature. Notable exceptions include:

- Hughes’ (2005) doctoral thesis ‘An examination of facilitators and inhibitors to knowledge sharing in a policing environment: lessons from intelligence-led crime management units of the Western Australia police service’;

---

\(^{10}\) The word ‘intervention’ is used in preference to ‘initiative’ because it has positive and negative, and benign and non-benign connotations. It also implies some sort of purposeful, deliberate, and conscious action that is intended to be permanent or long-lasting. Initiative, on the other hand, implies that the purpose is a first step towards some action.
• James’ (2005) doctoral thesis ‘Knowledge asset management: the strategic management and knowledge management nexus’;

• Tare’s (2003) doctoral thesis ‘A future for human resources: a specialised role in knowledge management’;

• Jones’ (2001) doctoral thesis ‘Knowledge management: a quantitative study into people’s perceptions and expectations in the developing knowledge economy’; and

• Dilnutts’s (1999) doctoral thesis ‘Knowledge management as practiced in Australian organisations: a case study approach’.

This research will contribute to the growing Australian literature on knowledge management.

Finally, a lot of management practice, including knowledge management practice, has an evangelistic quality and relies upon a ‘business guru’ or self-proclaimed expert to justify its contention. Indeed Henry Mintzberg makes the observation that:

_A good deal of the corporate planning I have observed is like a ritual rain dance; it has no effect on the weather that follows, but those who engage in it think it does. Moreover, it seems to me that much of the advice and instruction related to corporate planning is directed at improving the dancing, not the weather_ (Mintzberg 1994, p. 139).

To use Mintzberg’s metaphor, this research will contribute to improving the weather rather than the dance. The research is justified on the grounds that it will add to the body of contextualised information on management practice.
Section 4  Methodological Foundations

‘If we take in our hand any volume: of divinity or school metaphysics for instance: let us ask
‘Does it contain any abstract reasoning concerning quantity or number?’  No. ‘Does it
contain any experimental reasoning, concerning matter of fact and existence?’  No. Commit
it then to the flames: for it can contain nothing but sophistry and illusion’.

David Hume - Scottish Philosopher (Partington 1996, p. 355)

4.1 Philosophical posture

This research is positioned in the constructivist tradition qualitative research paradigm,
based on the systems thinking school. In this school phenomena, such as knowledge, are
thought of as being complex wholes of material and immaterial things, with the
component entities being hierarchical, but of themselves being able to be treated as
wholes (Hitchins 1992, p. 11). Social phenomena are constructed and as such must be
positioned in time, space and culture, but can be decomposed to smaller components.
Furthermore the properties of these phenomena are emergent depending on where the
system boundary is drawn.

4.2 Proposed methodology

The central question of a methodology is - ‘How can a researcher discover whatever they
believe can be known (Guba & Lincoln 1998)?’ - where methodology is defined as:

‘… a generic combination of methods that is commonly used as a whole – as
in soft systems methodology, strategic options development and analysis, or
survey methodology covering the design and analysis of questionnaires
(Mingers 2003, p. 559).’

The philosophical posture that is adopted, together with the desired objectives of the
research, determine the logic attributes of the methodology to be employed. Building on
the philosophical posture outlined above, this research will employ a hybrid qualitative
methodology based on Checkland’s soft systems methodology (see Checkland 1993a; see
Checkland 1993b; Checkland 1999; Checkland & Scholes 1990) and Strauss and
Corbins’ version of grounded theory (see Strauss & Corbin 1998). A brief account of soft systems methodology and grounded theory is presented below.

### 4.2.1 Soft systems methodology

Soft systems methodology has its foundations in action research and general systems theory, but has evolved into a methodology in its own right. It is characterised by involvement in a problem situation and learning by doing. It is further characterised by trying to see a system from as many perspectives as possible, and through the eyes of others rather than the researcher. Soft systems methodology is concerned with human activity systems, where a human activity system is defined as:

> ‘... a notional purposive system which expresses some purposeful human activity; activity which could in principle be found in the real world. Such systems are notional in the sense that they are not descriptions of actual real-world activity (which is an exceptionally complex phenomenon) but are intellectual constructs; they are ideal types for use in debate about possible changes which might be introduced into a real-world problem situation’ (Checkland 1999, p. 314).

Human activity systems by their very nature are complex. They are considered to be holistic, subjective, process oriented, in a state of constant flux, and often non-rational. Further, they act based on an interpretation of the world, but there are always several world views because individuals interpret the world differently. This means that for a soft systems methodologist there is no single correct answer to a problem situation. It also means that the models that are derived from the methodology are neither valid nor invalid, but rather represent a particular world view or ‘weltanschauung’.

Checkland’s soft systems methodology is typically depicted as a seven step process, as shown at Figure 1. Steps 1 and 2 can be grouped and might be called the ‘expression phase.’ Step 3 might be called the ‘naming phase.’ Steps 4, 4a and 4b are the ‘modelling phases.’ Step 5 is the ‘comparisons phase’, Step 6 the ‘change identification’ phase and Step 7 the ‘action phase.’ Questionnaires and interviews are commonly used in the expression phase. A focus group is used in the naming phase. In the modelling phase it is not uncommon to expose the focus group to the models and follow this up with
interviews. On the other hand the comparisons and change identification phase tend to use discussion forums.

Figure 1: Checkland’s soft systems methodology

Despite these comments there are many tools and techniques available for use in each phase of the methodology. For example in the modelling phase cognitive maps, concept maps, social network maps, and causal loops are all contenders. These models are used as devices to assess, reassess, and develop the researcher’s interpretations of the participants’ ‘weltanschaung’. Indeed these various approaches might be integrated to produce the model or models, and ideally models should generate data and ideas for change that are both culturally feasible and systematically desirable.

In the comparisons and change identification phase matrices can be used to compare the models and to structure process. Similarly scenario analysis can be used to compare the efficiency and effectiveness of the models; typically this uses mathematical simulations, spreadsheet and database manipulations and the like, depending on the situation under examination and the type and veracity of the datum.
Soft systems methodology, as originally conceived by Checkland, is neither a theory generation methodology nor a theory testing methodology. This leaves it open to criticism as not being suitable as a research methodology, and indeed confining it to a problem solving tool rather than methodology status. If however Hitchins’ (1992, p. 225), seven attributes of a methodology (it applies to any system; is simple; is comprehensive; is creative and innovative; is for individual and team use; is supported by tools and methods; and is proven in practice) are accepted then clearly it is a methodology.

The questions then remain ‘can it be used to generate theory’ and ‘can it be used to test theory?’ With regard to the first question Checkland provides an example where soft systems methodology was used to examine a purely theoretical problem (Checkland 1999, pp. 194, 202 -6). He also provides a discussion on using the model out of sequence and relocating the real-world systems-world line (Checkland 1999, pp. 210 - 3) so that Steps 1 and 2 are in the systems world, and Step 6 results in a theory for action. This reflects later thinking on Checkland’s behalf and demonstrates that methodologies are not set in concrete.

The second question is more problematic as it is difficult to provide a publicly defensible proof of individuals’ perceptions\(^\text{11}\). Indeed soft systems methodology does not produce a predictable outcome, or one that can be exactly replicated in other circumstances. Consequently while a soft systems methodology outcome may be intuitively appealing, it cannot be used as an argument that the solution is optimal or even desirable (Sparks 1997, pp. 5-22). This provides a good argument to integrate it with grounded theory.

### 4.2.2 Grounded theory

Grounded theory is an inductive rather than a deductive methodology. Typically the researcher does not begin with a preconceived theory, unless their purpose is to elaborate

---

\(^{11}\) This problem is not unique to soft systems methodology. The same criticisms can, for example, also be levelled against ethnography and narrative methodologies.
and extend an existing theory. Instead the researcher begins with an area of interest, or an idea, and allows the theory to emerge from the data (Strauss & Corbin 1998, p. 12). This means that data should be drawn from multiple sources. Data are usually collected by means of interviews or focus groups, as well as observation and questionnaires. The intent is to develop an account of phenomena, which identify its major categories, the relationship between the categories, and the context and processes which are occurring (Becker 1993). The result is a middle order theory, as opposed to grand theory or a hypothesis, which explains the phenomena (Alston & Bowles 2003). The general steps in grounded theory are depicted at Figure 2.

Figure 2: The general steps in grounded theory

The notion of theory is of itself an important assumption in grounded theory. Theory is not considered to be a perfect end-product, but rather an ever emerging complex constructed entity (Strauss & Corbin 1998, pp. 21-4). Theory is defined as:

‘... a set of well-developed categories (e.g., themes, concepts) that are systematically inter-related through statements of relationship to form a theoretical framework that explains some relevant social, psychological, educational, nursing, or other phenomenon. The statements of relationship explain who, what, when, where, why, how and with what consequences an event occurs (Strauss & Corbin 1998, p. 22).’

The resultant theories need not deal in falsifiable propositions, but meaning must be sought within context, and positioned in time and space. Further multiple meanings must be accommodated. Facts are always considered to be theory loaded and value laden (Goulding 1998, p. 53). Emergence is also a key assumption in grounded theory. Data, information and knowledge are seen as emergent phenomena that are actively constructed. They therefore can only have meaning when positioned in time, space and culture, and are only relevant in an experiential world (Goulding 1999).
Each step of a grounded theory analysis, as depicted in Figure 2, requires complete and careful documentation. Typically grounded theory collects data through interviews or focus groups, but can also use observation and questionnaires. Interviews may be structured or unstructured, and focused or unfocussed, depending upon the research design (Alston & Bowles 2003). In every case extensive notes are taken, and usually conversations are electronically recorded, so that they can be examined in detail at a later date. A key technique in grounded theory is three-pass data coding into categories.

Coding is a categorisation and labelling exercise of data fragments. Data are sorted into categories that have relationships. This is achieved by analysing transcripts word-by-word, line-by-line and phrase-by-phrase (Douglas 2003, p. 47), which is obviously very time consuming if done properly and may result in the researcher becoming ‘lost’ in the data (Goulding 1998, p. 56). Open Coding occurs in the first pass, and is used to determine the initial categories. Axial Coding occurs once the categories exist. One category is selected as the core concept and all other categories are related to it. The core category is determined by:

- selecting a category that appears frequently,
- comparing it with other categories,
- eliminating category redundancy, and
- ensuring all, or most, other categories have a relationship with it.

Selective Coding occurs in the last pass. Relationships between the core category and other categories are both described and explained, using data quotations to support the concepts – this helps to generate the theory. The resultant theory is a middle range theory that is applicable to a substantive topic. That is, it is not a grand theory or a minor hypothesis, but is generalisable. The essential criteria for the derived theory are fit, understandability, generalisability, and control (Glasser & Strauss 1967, pp. 237-50).

A major area of contention with regard to coding is data saturation. Data are supposed to be collected and analysed until saturation is achieved – that is data continues to be collected as the theory emerges until such time as any new data does not contribute to the
theory. In practice it is very difficult to determine when this point has been reached. Furthermore because this is an iterative process it is often not possible to fully pre-determine and scope a research topic (Wastell 2001, p. 631).

4.2.3 Justification for a hybrid methodology

Grounded theory is a sound research approach for any behaviour that has an interactional element to it (Goulding 2005, p. 296). Earlier it was established that knowledge is a fluid mix of data, experience, practice, values, beliefs, standards, context, and expert insight that provides a conceptual arrangement for evaluating and incorporating new data, information and experiences (Davenport & Prusak 1998, p. 5) – in this sense it is interactional.

Soft systems methodology is concerned with human activity systems and captures the participant’s world view rather than the researcher’s. Soft systems methodology is an appropriate research approach because knowledge is an emergent property of humans, and human activity systems. It brings with it the added advantage that it provides a sound basis to completely articulate a problem, or define and refine a question, for research.

The two methodologies therefore complement each other, because they both deal with human activity systems. Indeed a comparison of the two methodologies reveals that they are both seven-step processes, with remarkable similarities. This is illustrated at Table 1, which lines up the methodological steps.

It is immediately apparent that the two methodologies are complementary. For example steps 4 and 5 result in similar outcomes, albeit they are expressed differently. Further many of the same methods, tools and techniques can be used in either methodology. For example the use of questionnaires and interviews are common to both methodologies. It is also not inconceivable that focus groups could also be used as a data source in both methodologies, or that a rich picture could be used as the end product to depict the derived theory.
Methodology

<table>
<thead>
<tr>
<th>Steps</th>
<th>Soft Systems Methodology</th>
<th>Grounded Theory</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The problem situation unstructured</td>
<td>An unexplained phenomena or process</td>
</tr>
<tr>
<td>2</td>
<td>The problem situation expressed</td>
<td>The phenomena or process identified for study</td>
</tr>
<tr>
<td>3</td>
<td>Root definitions of relevant systems</td>
<td>Data collection and coding</td>
</tr>
<tr>
<td>4</td>
<td>Conceptual model construction</td>
<td>Theme extraction</td>
</tr>
<tr>
<td>5</td>
<td>Model and problem situation comparison</td>
<td>Postulate generalisations</td>
</tr>
<tr>
<td>6</td>
<td>Feasible and desirable change construction</td>
<td>Develop taxonomies</td>
</tr>
<tr>
<td>7</td>
<td>Action to improve the situation</td>
<td>Theory development</td>
</tr>
</tbody>
</table>

Table 1: A comparison of soft systems methodology and grounded theory

Both methodologies share the assumption that the problem or the phenomena determines the final model or theory. Both methodologies have in common surfacing and exploring participants’ values and beliefs – in this sense they both share constructivist and interpretivist philosophical positions. The practical difference is that soft systems methodology values data from the perspective of the participant, whilst grounded theory develops theory from data interpretation by the researcher. Therefore it is logical that by integrating the two methodologies the research question will have a more holistic explanation: this is the primary justification to integrate the two methodologies.

12 The juxtapositions of the soft systems methodology and grounded theory entries is not meant to infer equivalence, rather the intent is to show the two methodologies are complementary.
4.2.4 Methodological limitations

Real world activities are ‘hows’ related to a specific ‘what’, which is usually implicit rather than explicit. In social situations the ‘whats’ can be difficult to define and many problems might be considered to be ‘wicked’ – that is they are complex, dynamic, systemic, emergent, difficult to resolve, and confounding to manage (McLucas 2003, p. 220). This means that a limitation of the combined methodologies is knowing when to stop collecting data, and then validating the collected data. Further the inherent complexity means that it may be difficult to develop valid theories and models from the data. Model and theory deficiencies could arise from the inclusion of irrelevant variables, the exclusion of relevant variables, insufficient or poor variable evaluation, and incorrectly formulated constraints.

4.3 Section Conclusion

Soft systems methodology can be used to model real world ‘whats’, and equally to model alternative ‘hows’ for improvement. Indeed Gao, Meng and Nakamori (2002) suggest that soft systems methodology is a valuable research approach to study knowledge management, and that some of its value is ‘to offer inspiration on how to learn continuously and effectively (Gao, Meng & Nakamori 2002, p. 13).’ Soft systems methodology lends itself to develop a set of structured research questions to a wicked problem. It is also useful to assist in building a road-map of the research project, and to show the logical dependencies of the various research activities in multi-disciplinary research activities (Hindle et al. 1995), particularly given that the research process in this circumstance is of itself a purposeful human activity and therefore is part of a human activity system. Soft systems methodology can also be used as part of the research triangulation process, which confirms, amplifies or refutes findings.

Similarly grounded theory is useful in situations where little is know about a topic or problem area, or to generate new and exciting ideas in settings that have become static or stale. It is a powerful and thorough research method for collecting and analysing research data, and can provide deep insight into the real issues associated with phenomena. Furthermore it forces deep consideration of the variables by the researcher. The power of
grounded theory lies in the depth of analysis and the resultant explanation. A good
grounded theory explains rather than describes, which gives it a predicative quality
(Douglas 2003, p. 51). Because of the depth of analysis grounded theory results in deep
understanding of phenomena.

Therefore the proposed hybrid methodology will:

- enable exploration of the participants’ world-views on knowledge and workplace
  productivity, so that they can be contrasted with the debate in the literature – that
  is the methodology is participant centred;

- allow the researcher to develop a theory of knowledge productivity from the data
  that is ultimately acceptable to a wider audience - that is the methodology is
  researcher centred; and

- ultimately permit either a generic model of knowledge productivity or a public-
  sector model of knowledge productivity to be developed.

Having provided the methodological foundations for this research, the next section
explains what the research strategy is, how the research will be conducted, and what
tools, techniques and methods will be employed.
Section 5   Methods and Approach

‘It is a capital mistake to theorise before you have all the evidence. It biases the judgment’.

Sir Arthur Conan Doyle - Scottish Writer (Partington 1996, p. 256)

5.1 Assumptions, propositions and primary research questions

The problem being addressed in this research is - ‘How can public-sector organisations enable knowledge for improved productivity and positive exploitation?’ This question is derived from four assumptions and two propositions, which have been determined from the preliminary literature review, the researcher’s own experience, and the methodological framework to be employed. They are:

- **Assumption One.** Data, information, and knowledge are interacting holons within complex social systems.

- **Assumption Two.** Each social system has its own data, information and knowledge holons.

- **Assumption Three.** Public-sector organisations are complex soft systems, consisting of formal and informal holons each with their own knowledge holons.

- **Assumption Four.** There is a positive relationship between workplace productivity and knowledge enablement.

- **Proposition One.** Organisations find it difficult to exploit knowledge because they do not define what constitutes knowledge for them.

- **Proposition Two.** Organisations find it difficult to implement knowledge management initiatives because the examples in the literature are ‘models of knowledge’ rather than ‘knowledge management models’ with explicit processes.
In order to solve the research problem it is necessary to answer the following three research questions:

- **Research Question One.** What constitutes data, information and knowledge for public-sector organisations?

- **Research Question Two.** How do public-sector organisations evaluate a knowledge claim, both at the personal and organisational level?

- **Research Question Three.** What workplace practices support individual and organisational productivity, and in turn enable knowledge?

### 5.2 Research locations

To answer these questions, *noting that permissions are yet to be sought*, it is proposed to study a knowledge management intervention in the Australian Public Service Commission, or some other suitable organisation. The Australian Public Service Commission has been chosen because of its central leadership role in the Australian Public Service. It is also understood that it is about to embark on a knowledge management initiative. Furthermore the researcher’s supervisors have senior management contacts inside the organisation, which should ease the processes of obtaining permissions and gaining management’s support for the research.

Land and Water Australia is an ideal candidate for the conduct of the pilot study because it is a small department of less than 100 people that has an active knowledge management program, and a dedicated knowledge management team of eight. Furthermore it already has a knowledge focus and even lists knowledge as one of its key outcomes (*Land and Water Australia Annual Report, 2003–04, p. ii*).

### 5.3 Research strategy

Sullivan and Harper (1996, pp. 98-9) say that strategy is:

‘... an intellectual construct linking where you are today with where you want to be tomorrow in a substantive, concrete manner. ... Strategy begins with
tomorrow – the vision – and is the process of looking back and identifying the critical paths to the future. The essential character of strategy is that it relates ends to means’.

The strategy to be employed in this research is a case study, which employs a phased approach based on soft systems methodology and grounded theory. Case study research allows the researcher to intervene and ask questions of a subject, and has the flexibility to allow focus to be shifted to whatever seems the most interesting and relevant at the time (Graziano & Raulin 1989, p. 41). It is an appropriate research strategy when ‘a how or why question is being asked about a contemporary set of events over which the investigator has little or no control’ (Yin 1994, p. 9), or where the ‘theory base is weak and the environment under study is messy’ (Harrison 2002, p. 158).

Phase one encompasses all the preliminary requirements to gain approval for the research, as well as instrument design, and the conduct of a small pilot. Phase two involves data collection and analysis. Focus groups, surveys and personal interviews will be used, along with a number of software tools to aid analysis. Model and theory development will be developed in parallel. Phase three is the write up of the thesis and the production of a report for the organisation that was researched.

Each phase has a number of steps, many of which are iterative. These steps are discussed in detail in the next sub-section, using the construct purpose, method, and endstate to aid understanding where required. A map showing the steps, and the relationships between the steps and phases, is presented at Figure 3.
Figure 3: The research design phases and steps
5.4 Research design

5.4.1 Step 1: Present the research proposal seminar

Purpose. The purpose of the research proposal seminar is to confirm the researcher’s candidature for the doctorate, and to allow the examiners to assess the feasibility and worth of the research.

Method. This paper will be circulated to the examiners not later than Tuesday the 1st of February 2006. The seminar will be presented in the window Thursday the 9th of February 2006 to Thursday the 23rd of March 2006. A Microsoft® PowerPoint® presentation will be used as an aid on the day.

Endstate. The endstate of step 1 is approval to proceed with the research, and confirmation of candidature by the Divisional Research Degree Committee of the University of Canberra.

5.4.2 Step 2: Gain approvals and permissions

Purpose. The purpose of this step is to gain all the necessary approvals, permissions and permits for the research to proceed.

Methods. Formal and informal methods will be used. First an appropriate person (to be identified) in the senior management of the Australian Public Service Commission and the Knowledge Manager of Land and Water Australia will be approached by the researcher to ascertain their organisations’ interest in participating in the research. If there is interest and a willingness to participate a formal letter seeking permission to conduct the research in the organisation will be prepared by the researcher on University of Canberra letterhead, and addressed to the Secretary of the organisation.

Following approval any ethics documentation required by the organisation will be completed. Concurrent with this activity the ethics documentation required by the
University of Canberra will be completed. It is proposed to submit the ethics document for approval on either Thursday the 23rd of February 2006 or Thursday the 30th of March 2006. A further discussion on ethical considerations is presented at sub-section 5.5.

**Endstate.** The endstate of step 2 occurs when all necessary approvals, permissions and permits for the research to proceed have been obtained. This includes the ethics approval by the University of Canberra Ethics Committee, and approvals by ethics committees of the organisations in which the research will be conducted.

### 5.4.3 Step 3: Design the research instruments

**Purpose.** The purpose of this step is to design the research instruments that will be used for data collection in the research.

**Methods.** This step begins with a search of the literature to see if a proven instrument, or instruments, exists. If a proven instrument exists then permission will be sought from the owner to use it in this research. If no suitable instrument exists some of the forms in Tiwana’s (2002) book ‘The knowledge management toolkit : orchestrating IT, strategy, and knowledge platforms’ are possible candidates for modification. If required assistance in the design of the instruments will be sought from other researchers at the University of Canberra. The proposed instrument for the pilot study will be submitted as part of the ethics proposal at step 2.

**Endstate.** The endstate of step 3 occurs when all the instruments, and a guide for their use, have been developed so that a pilot study can proceed.

### 5.4.4 Step 4: Conduct a pilot study

**Purpose.** A small pilot study will be conducted at Land and Water Australia assuming they grant permission to do so. The purpose of the pilot study is to gain some mastery of the methods and tools, and to identify problems with the approach.
Methods. The same methods to be used in main study as detailed below will be used in
the pilot study, with the exception that multiple data iterations and detailed analysis will
not occur.

Endstate. The endstate of the pilot study is sufficient data to validate the approach, and a
small report for the organisation. It may also include a journal article or conference paper.

5.4.5 Step 5: Refine the research instruments and methods

Purpose. The purpose of step 5 is to take the lessons from step 4 and correct any
problems with both the design of the instruments and the research approach.

Methods. The instruments will be analysed by the researcher to identify any
shortcomings that require correction. Similarly the stenographer will be asked to identify
any difficulties they had in capturing and inputting data. Finally the participant’s
themselves will be invited to suggest any improvements.

Endstate. The successful conclusion of step 5 marks the end of phase one and the
beginning of phase two. The endstate of step 5 occurs when all amendments to the
instruments and a guide for their use have been developed, and the research approach has
been modified and the changes documented, so that phase two can proceed.

5.4.6 Step 6: Conduct the first organisation-wide survey

Purpose. The purpose of the organisation-wide survey is to identify and target those
individuals that are the central connectors, knowledge brokers, and boundary spanners of
the organisation, where:

- a central connector is ‘someone who is highly connected to many others in the
  network, who may be either a key facilitator or a gatekeeper’ (Anklam 2005, p.
  344);
• a broker is ‘someone who communicates across sub groups’ (Anklam 2005, p. 344); and

• a boundary spanner is a ‘person who connects a department with other departments’ (Anklam 2005, p. 344).

The intent is to invite these individuals to participate in several focus groups, surveys and personal interviews during the course of the research, because these individuals already understand data, information and knowledge flows within the organisation. This means that the research will be highly targeted and should produce an outcome that is at least useful to the organisation.

**Methods.** Social network analysis will be the principal technique used in this step. Social network analysis is the measurement and mapping of relationships and flows between people, groups, and organisations (Kilduff & Tsai 2005). The nodes in the network are the people, groups or organisations while the links show relationships or flows between the nodes – in this case data, information and knowledge. Social network analysis provides both a visual and a mathematical analysis of human relationships (see Carrington, Scott & Wassermann 2005; Scott 2005; Wassermann & Faust 1999), and sits comfortably in the systems thinking paradigm.

A three part self administered survey, in the form of an anonymous questionnaire will be used to collect data for the analysis. Depending on the organisation it may be web-enabled using *WebSurveyor*¹³ or a similar tool. Part one of the questionnaire is designed to identify the central connectors, knowledge brokers, and boundary spanners, as well as the data, information and knowledge flows of the organisation. The type of question posed in this section will be along the lines of - ‘Who do you ask when you have a question involving ...?’ (Liebowitz 2005). Appendix A of Scott and Parkers’ (2004)

---

¹³ *WebSurveyor* is an online web enabled survey tool. The tool allows several question formats, including open ended questions, and matrix-format queries with multiple rows and columns. It allows raw data visualisation almost immediately after the closure of the survey, and the data can be exported as comma or tab separated text files for subsequent analysis. Further details on *WebSurveyor* can be located at [www.websurveyor.com](http://www.websurveyor.com).
book ‘The hidden power of social networks’ provides a template for this section of the questionnaire.

Part two of the questionnaire will pose some opened ended questions along the lines of:

- ‘What type of knowledge is needed to do your work?’
- ‘What is the difference between knowledge and information for you in your work?’
- ‘What does your organisation mean by the term knowledge management?’
  (Coakes & Bradburn 2005, p. 65)

Part three will collect some demographic and biographical data.

**Endstate.** If the survey is web-enabled then step 6 is complete two weeks after the deployment of the survey, and when all data has been downloaded from the server. If the survey is not web-enabled then step 6 is complete one month after the mail out. In either case the endstate of step 6 occurs when there is sufficient data to identify those individuals that are the central connectors, knowledge brokers, and boundary spanners of the organisation.

**5.4.7 Step 7: Do the initial data analysis**

**Purpose.** The purpose of the initial data analysis is threefold. Firstly it will identify those individuals who would be ‘ideal’ to participate in subsequent focus groups, and questionnaires. Secondly it enables the correct expression of the problem from the participants’ viewpoint. Finally it will allow the development of focused questions in preparation for the next step.
**Methods.** Data from part one of the questionnaire will be entered into *NetMiner*® ¹⁴ so that relationships can be both visualised and analysed. Data from parts one and two of the questionnaire will be entered into *NVivo*® ¹⁵ so that any patterns and themes can be identified.

**Endstate.** The endstate of Step 7 is a personal invitation and follow-up letter inviting the central connectors, knowledge brokers, and boundary spanners to participate in the subsequent steps of the research, and the expression of the problem from the participants’ *weltanschauung*.

Two by-products will emerge from this step. First an initial report will be provided to the organisation on the social network analysis. This report might include recommendations on work load balancing, role redefinition, cooperation gaps, and knowledge gaps (Lin, Yeh & Tseng 2005). The intent of this report is to gain further buy-in for the research. The second by-product is a short paper that is suitable for publication in a peer reviewed journal such as the *Journal of Knowledge Management*, *Knowledge Management Research and Practice*, or the *Journal of Social Structure*.

### 5.4.8 Step 8: Lead the initial focus group

**Purpose.** After the initial data analysis step there will be at least three iterations of data collection and analysis. The first iteration will be a focus-group in a workshop setting. The purpose of the focus-group is to capture a visual representation of root definitions

---

¹⁴ *NetMiner*® is a software tool for exploratory network data analysis and visualisation. Its unique feature lies in the integration of standard social network analysis methodology with modern computer assisted visualisation techniques. *NetMiner*® allows the researcher to explore network data interactively, and helps to detect the underlying patterns and structures of the network. It has the added advantage of supporting a number of standard statistical routines from within the software, including correlations and regression, analysis of variance, and descriptive statistics. Data can also be exported into other statistical packages such as SPSS®. Further details on *NetMiner*® can be located at [http://www.netminer.com/](http://www.netminer.com/). An example of the visualisation output of *NetMiner*® is at Figure 8 in Appendix 2.

¹⁵ *NVivo*® is a commonly used software tool in the social sciences, particularly with researchers employing mixed methods research, grounded theory, or action research methodologies. It is a coding tool that allows qualitative linking, shaping and modelling to support interpretation and theory emergence. Further details on *NVivo*® can be located at [http://www.qsrinternational.com/products/](http://www.qsrinternational.com/products/).
and concepts and to gain some consensus. The data is from the participants’ viewpoint and will be used to inform subsequent data collection iterations.

**Methods.** Either Semantica®\(^{16}\) or CmapTools®\(^{17}\) will be used as data capture tools. A stenographer will input data directly into the tools in the course of the focus group. If participants agree the focus group will be also recorded.

The root definitions will be developed using Checkland’s CATWOE construct (Checkland 1999), where CATWOE is a mnemonic for:

- **Customers** – the beneficiaries of the system.
- **Actors** – the ‘players’ who transform the system.
- **Transformation** – of input and output.
- **Weltanschauung** - the specific ‘world view’ that makes the transformation meaningful.
- ** Owners** – those actors who could stop or change the nature of the transformation.
- **Environment** – the constraints on the system that are outside of the system boundary and its scope.

**Endstate.** The endstate of step 8 occurs when the focus group has concluded and data has been inputted into the analysis tools.

---

\(^{16}\) Semantica® permits the construction of a set of ideas or concepts in a manner that is conducive to their construction, including those that are developed in an evolutionary manner or by a number of different people. It is an exceptionally powerful tool for the development of a conceptual framework such as required for this research. Further it permits the generation of a report, or the copying of diagrams, so the result can be presented in a number of formats, including within the tool itself if desired. Its real strength is the ability to show interactively emergent concepts. Details on Semantica® can be located at [http://www.semanticresearch.com/](http://www.semanticresearch.com/). An example of the visualisation output of Semantica® is at Figure 9 in Appendix 3.

\(^{17}\) The CmapTools® software suite is a product of the Institute for Human and Machine Cognition at the University of West Florida. It allows users to construct concept maps representing their understanding of a domain of interest to produce knowledge models. Further details on CmapTools® can be located at [http://cmap.ihmc.us/](http://cmap.ihmc.us/). An example of the visualisation output of CmapTools® is at Figure 10 in Appendix 4.
5.4.9 Step 9: Do the second data analysis

Purpose. The purpose of this step is to determine the initial categories and themes, and to develop a rich picture or pictures of the researcher’s interpretation of the data.

Methods. Open coding using NVivo® will occur in this step and will be used to determine the initial categories. Themes will be coded independently by myself and another coder\(^\text{18}\), who will discuss the reasons for any discrepancies in keeping with good grounded theory practice (see Strauss & Corbin 1998).

The rich picture or pictures will be developed using Microsoft® Visio®.

Endstate. The endstate of step 9 occurs when rich pictures have been developed, open coding has occurred, initial categories agreed, and the outline of the semi-structured interviews to occur in step 10 has been developed from the data.

5.4.10 Step 10: Conduct semi-structured interviews

Purpose. Following the focus-group workshop and step 9 at least two semi-structured interviews will occur, unless there is a need to conduct another workshop. The purpose of these interviews is to collect data and expand upon themes identified in the previous steps.

Methods. The interviews will be recorded, unless the participants object in which case minutes will be taken. Open-ended questions will be sent to the interviewees prior to the meetings. This offers the interviewee the opportunity to prepare for the meeting should they so desire, and should help to keep the interview on track. Probing techniques will be used to increase the depth and richness of responses. The analysis following each

\(^{18}\) Mr Tony Eccleston from the Division of Communication and Education has agreed to assist me with coding.
interview iteration will be used to develop the set of questions for the next round of interviews.

Endstate. The endstate of step 10 occurs when all of the semi-structured interviews have concluded, and data has been inputted into the various analysis tools.

5.4.11 Step 11: Do the third data analysis

Purpose. The purpose of this step is to determine the core concept from the data.

Methods. Axial coding, using NVivo®, will occur in this step. One category will be selected as the core concept and all other categories related to it. The core category will be determined by:

- selecting a category that appears frequently,
- comparing it with other categories,
- eliminating category redundancy, and
- ensuring all, or most, other categories have a relationship with it.

Endstate. The endstate of step 11 is when axial coding has occurred, the core concept agreed, and there is sufficient data to develop the conceptual model and initial theory.

5.4.12 Step 12: Develop a conceptual model and initial theory

Purpose. The purpose of step 12 is to develop a conceptual model and initial theory from the data. It is iterative with the data analysis steps.
Methods. The knowledge productivity model will be continually refined in either *Semantica*® or *CmapTools*®, or some other appropriate tool, as data is interpreted.

Endstate. The endstate of this step is a theory that describes what data, information and knowledge means for a public-sector organisation. The expected outputs of the model, or models, are a pictorial description of how work is performed, how knowledge enables workplace productivity, and the factors that make tasks easier or harder.

### 5.4.13 Step 13: Lead the second focus group

**Purpose.** The classical Prussian military strategist Carl Maria von Clausewitz said over 200 years ago:

> ‘The first task of any theory is to clarify terms and concepts that are confused ...
> Only after agreement has been reached regarding the terms and concepts can we hope to consider the issues easily and clearly and expect to share the same viewpoint with the reader’ (Von Ghyczy, Von Oetinger & Bassford 2001, p. 99).

The purpose of step 13 is to validate and clarify the terms and concepts.

**Methods.** The interpretation of the interview data and the resultant model or models arising from the previous steps will be presented to the interviewees at a focus-group workshop. This will provide the interviewees the opportunity to comment on the outcome to date and inform the design of the second organisation-wide survey.

**Endstate.** The endstate of step 13 occurs when the focus group has concluded and data has been inputted into the analysis tools.

---

19 Another possible tool is *PCPACK* which is a commercial application developed by Professor Nigel Shadbolt’s Artificial Intelligence Group at the University of Nottingham. The tool offers several visualisations, but the researcher is yet to evaluate the tool for its utility in this research project. Further details about *PCPACK* can be located at [http://www.epistemics.co.uk](http://www.epistemics.co.uk).
5.4.14 Step 14: Design the second organisation-wide survey

**Purpose.** The purpose of this step is to design the survey instrument that will be used for the final data collection in the research.

**Methods.** The data from the previous steps will be used to inform the survey. The survey will include some questions from part two of the initial survey conducted at step 6. Most questions will be open ended with the emphasis placed on determining how well the theory and model matches the perceptions of the real world of the inhabitants of the wider organisation.

**Endstate.** The endstate of step 14 occurs when the survey is designed and deployed.

5.4.15 Step 15: Conduct the second organisation-wide survey

**Purpose.** The purpose of this step is to see how well the theory and model matches the perceptions of the real world of the inhabitants of the wider organisation.

**Method.** Depending on the organisation the survey will either be web-enabled using WebSurveyor or a similar tool, or mailed to all of the personnel in the organisation.

**Endstate.** If the survey is web-enabled then step 15 is complete two weeks after the deployment of the survey, and when all data has been downloaded from the server. If the survey is not web-enabled then step 15 is complete one month after the mail out. In either case the endstate of step 15 occurs when there is sufficient data to conduct the final analysis, and data has been inputted into the analysis tools.

5.4.16 Step 16: Do the final data analysis

**Purpose.** The purpose of this step is to conduct selective coding of the data and compare it with the categories so that a substantive theory and model can be developed.
Methods. Step 16 will take data resulting from Step 15 and correlate it with the previous data to refine the model and the theory. Selective Coding using NVivo® will occur in this step. Relationships between the core category and other categories will be described and explained, using data quotations from earlier steps to support the concepts. From this the final model or models, and a substantive theory will be developed.

Endstate. The endstate of step 16 is when selective coding has occurred, and the data are sufficiently saturated to develop the substantive theory and model.

5.4.17 Step 17: Develop the substantive theory and model

Purpose. The purpose of this step is to develop the final substantive theory, including a model, that explains, rather than describes what data, information and knowledge means for a public-sector organisation, and how a knowledge claim is evaluated

Method. The substantive theory and supporting model will be developed from the data analysis that occurred in the previous steps.

Endstate. The successful conclusion of step 17 marks the end of phase two and the beginning of phase three. The endstate of this step is a substantive theory that explains, rather than describes what data, information and knowledge means for a public-sector organisation, and how a knowledge claim is evaluated. It will include a model or models that provide a pictorial description of the theory.

5.4.18 Step 18: Write the organisation report

Purpose. Step 18 is the production of a report for the organisation that was researched. The intent is to provide a report that the organisation can use to progress its knowledge management initiative.

Endstate. Step 18 finishes when the report is delivered to senior management.
5.4.19  Step 19: Write the thesis

**Purpose.** Step 19 is the write up of the thesis and the production of a report for the organisation that was researched. It includes the final refinement of the knowledge productivity model, the supporting theory, and a means or framework to measure knowledge productivity. Importantly it will also identify areas for further research.

**Methods.** It is envisaged that the thesis will have eight chapters. A mind map of the outline thesis structure is presented at Figure 11 in Appendix 5. Table 2 shows the structure and approximate writing time for each section. Writing will be an iterative process subject to review, particularly if the data leads the researcher down unforseen paths.

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Words</th>
<th>Time to Write (months)</th>
<th>End Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>One</td>
<td>Introduction</td>
<td>5,000</td>
<td>3</td>
<td>April 2007</td>
</tr>
<tr>
<td>Two</td>
<td>Parent Theories of Knowledge</td>
<td>12,500</td>
<td>6</td>
<td>July 2007</td>
</tr>
<tr>
<td>Three</td>
<td>Existing Knowledge Management Models</td>
<td>12,500</td>
<td>6</td>
<td>December 2007</td>
</tr>
<tr>
<td>Four</td>
<td>Methodology</td>
<td>15,000</td>
<td>6</td>
<td>June 2008</td>
</tr>
<tr>
<td>Five</td>
<td>Data Analysis</td>
<td>20,000</td>
<td>9</td>
<td>December 2008</td>
</tr>
<tr>
<td>Six</td>
<td>Implications</td>
<td>15,000</td>
<td>9</td>
<td>December 2008</td>
</tr>
<tr>
<td>Seven</td>
<td>A Model and Theory of Knowledge Productivity</td>
<td>15,000</td>
<td>6</td>
<td>July 2009</td>
</tr>
<tr>
<td>Eight</td>
<td>Conclusion</td>
<td>5,000</td>
<td>3</td>
<td>October 2009</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>100,000</td>
<td>48</td>
<td>October 2009</td>
</tr>
</tbody>
</table>

Table 2: Proposed thesis structure and writing time
The content of the chapters will be as follows:

- **Chapter One** will outline the field of study and provide an initial focus on the research problem. It will introduce the research question, propositions and assumptions, as well as providing a justification for the research.

- **Chapter Two** is a literature review that presents the parent theories to build a theoretical framework for the research. A ‘model of knowledge’ lens will be used.

- **Chapter Three** is a literature review that takes the parent theories and examines them under a ‘knowledge management model’ lens.

- **Chapter Four** provides the theoretical framework for the research, and a description of the research methodology, including the approach, design, data capture method, and ethical considerations.

- **Chapter Five** will present the raw data, an analysis of the data, as well as the data collection instruments. It will contain rich pictures, as well as a number of tables and figures. Where necessary, and if appropriate, some quantitative analysis will be presented.

- **Chapter Six** is the results chapter. It will contain the implications and conclusions derived from this research. In particular it will discuss the implications for theory, policy and practice for public-sector managers and policy managers.

- **Chapter Seven** will present the model of knowledge productivity, and a theory of knowledge productivity.

- **Chapter Eight** will draw the thesis to a close. It will spell out the limitations of this research, make some proposition and research problem conclusions, and then recommend areas for further research.

**Endstate.** The endstate of step 19 is a thesis that is ready to be submitted for examination.
5.4.20 **Step 20: Submit the thesis for examination**

**Purpose.** The purpose of step 20 is to conclude this research and submit the thesis for examination.

**Method.** The thesis will be submitted for examination in accordance with University of Canberra requirements.

**Endstate.** Step 20 concludes when the examiners are satisfied that the thesis meets the requirements for the award of a Doctor of Philosophy, and no amendments are required.

5.5 **Ethical considerations**

A partially developed ethics proposal is at Appendix 6. A fully developed ethics protocol will be presented upon acceptance of this research proposal, noting that the research must conform to the requirements of both the University of Canberra Ethics Committee and the National Health and Medical Research Council. Depending upon approval to proceed with the research, and confirmation of candidature by the Divisional Research Degree Committee of the University of Canberra at step one, it is proposed to submit the fully developed ethics proposal for the pilot study on either Thursday the 23rd of February 2006 or Thursday the 30th of March 2006. A second ethics proposal will be developed after the conduct of the pilot study and submitted on Thursday the 14th of September 2006.

The National Health and Medical Research Council provide a set of guidelines, which are available online at [http://www7.health.gov.au/nhmrc/hrecbook](http://www7.health.gov.au/nhmrc/hrecbook), for research that involves humans. Of particular note for this research are the principles of: integrity, respect for persons, beneficence and justice; consent; and research merit and safety. The research protocol will include statements that explain the purpose of the research and make explicit the right of any participant to withdraw consent for further involvement in the research at any time. Further it will make explicit their right not to participate in the first instance. An initial draft consent form is at Appendix 7.
In the case of this research ethical requirements are complicated by the need to obtain consent from both the potential respondent and their parent organisations. Borgatti and Molina make the point that:

*Whereas in ordinary research there are essentially two parties that must come to agreement – the researcher and the respondent – in organizational research there are three. In addition, the fact of organizational hierarchy means that the employee’s participation in the research entails considerably more risk than in other situations* (Borgatti & Molina 2005, p. 107).

Steps four and six of this research design make use of social network analysis techniques, which bring with them problems of anonymity. In order to construct the network it is necessary for survey respondents to provide their name and the names of the people they interact with. Even if someone declines to participate it is likely that others will use their name and indicate they have some sort of network relationship, which means that non-response does not guarantee omission from the study (Borgatti & Molina 2005, p. 110).

To cater for the anonymity problem those individuals that do not wish to participate will be completely removed from the network data. In the final network diagram that will be published pseudonyms will be substituted for real names, and only senior management\(^{20}\) will be shown the actual network diagrams with the real data. Respondents who wish to see their own data will have the right to see their own data to confirm correctness. This means that they will only see names in their immediate neighbourhood and to which they are directly connected to.

To ensure the data is not used in an unintended way by the organisation the Secretary, or equivalent, will be asked to sign a ‘Management Disclosure Contract’ specifying that the data will not form the basis for evaluation of individual employees, but will only be used in a developmental way to improve the functioning of the organisation. Appendix 8 presents the initial draft form of this agreement.

---

\(^{20}\) Senior management is defined as the Secretary and the immediate divisional or branch heads that report to the Secretary. In the case of Land and Water Australia these people are: Mr Andrew Campbell, Dr Nick Schofield, Mr Anwen Lovett, Mr Tom Aldred, Mr Michael Lester, Ms Kate Andrews, and Mr Chris de Mamiel.
5.6 Research design limitations

There are several research design limitations. The most important is the social network analysis at steps four and six, which is used for subsequent sample selection. If a number of individuals decline to participate, the social network analysis will be distorted and a ‘real’ representation of the data, information and knowledge flows within the organisation will not be possible. In this circumstance the intent of the social network analysis – to identify the central connectors, knowledge brokers, and boundary spanners – will be defeated and may force the redesign of these steps to incorporate a different sampling method.

The subsequent steps are heavily data intensive and dependent on accurate data capture by the researcher, and sound coding. The coding process is of itself very time consuming, given transcripts must be analysed word-by-word, line-by-line and phrase-by-phrase, and may result in the researcher becoming lost or buried in data. Data are supposed to be collected and analysed until such time as any new data does not contribute to the emerging theory. In practice it will be very difficult to determine when this point has been reached.

Finally it must be recognised that this research is positioned in a particular organisation with its own local culture and sub-cultures. This inherent complexity means that it may be difficult to develop publicly defensible theories and models from the data, which have application across other public sector organisations.

5.7 Section Conclusion

This section has provided a detailed account of how the research will be conducted. To recapitulate, this research will be a three phase case study, using a methodology based on soft systems methodology and grounded theory. In total there are 20 steps, many of which are iterative. A map showing the steps, and the relationships between the steps and phases, is presented at Figure 3. The next section addresses some administrative matters for this research.
Section 6  Administrative Matters

‘If a man will begin with certainties, he shall end in doubts; but if will be content to begin with doubts, he shall end in certainties’.

Francis Bacon – English Philosopher (Partington 1996, p. 41)

6.1  Budget and resources

The research will be self-funded, although any assistance in the form of a scholarship would be very welcome. Table 3 presents an indicative budget.

<table>
<thead>
<tr>
<th>Item</th>
<th>Annual Cost</th>
<th>Total Cost (5 years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Books</td>
<td>$500.00</td>
<td>$2,500.00</td>
</tr>
<tr>
<td>Journals</td>
<td>$300.00</td>
<td>$1,500.00</td>
</tr>
<tr>
<td>Software</td>
<td>$150.00</td>
<td>$750.00</td>
</tr>
<tr>
<td>Minor Equipment &lt;$1,000</td>
<td>$250.00</td>
<td>$1,250.00</td>
</tr>
<tr>
<td>Office Supplies</td>
<td>$250.00</td>
<td>$1,250.00</td>
</tr>
<tr>
<td>Stationery</td>
<td>$500.00</td>
<td>$2,500.00</td>
</tr>
<tr>
<td>Printing and Binding</td>
<td>$250.00</td>
<td>$1,250.00</td>
</tr>
<tr>
<td>University Fees</td>
<td>$200.00</td>
<td>$1,000.00</td>
</tr>
<tr>
<td>Conference Fees</td>
<td>$1,500.00</td>
<td>$7,500.00</td>
</tr>
<tr>
<td>Airfares</td>
<td>$1,500.00</td>
<td>$7,500.00</td>
</tr>
<tr>
<td>Taxis and Hire Cars</td>
<td>$500.00</td>
<td>$2,500.00</td>
</tr>
<tr>
<td>Accommodation</td>
<td>$750.00</td>
<td>$3,750.00</td>
</tr>
<tr>
<td>Meals</td>
<td>$500.00</td>
<td>$2,500.00</td>
</tr>
<tr>
<td>Lost Wages @ $800 per day</td>
<td>$24,000.00</td>
<td>$120,000.00</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$31,150.00</strong></td>
<td><strong>$155,750.00</strong></td>
</tr>
</tbody>
</table>

Table 3: Indicative budget
If lost wages are excluded this research will cost $7,150 per annum or $35,750 over five years. If lost wages are included then the research will cost in the order of $31,150 per annum or $155,750 over five years. It is considered that these figures are very conservative.

6.2 Timetable

The doctorate will be completed on a part-time basis over five years in accordance with current University of Canberra guidelines. An initial plan for each phase is presented at Figure 4, Figure 5 and Figure 6 respectively. This plan will be reviewed regularly in light of continuous and iterative data analysis. It should be noted this pre-supposes that the initial seminar will be presented in the window Thursday the 9th of February 2006 to Thursday the 23rd of March 2006, and that approval to proceed with the research is granted, subject to obtaining permissions and ethics approvals, before the end of March 2006. It is intended to obtain the necessary permissions and approvals in the first half of 2006.

21 Figure 4, Figure 5, and Figure 6 show a plan for four years instead of a five year plan. One year has already been consumed completing prerequisite requirements such as a graduate research methodology unit, and courses to develop competence in some of the research methods, and this year is not included in the diagrams.

22 The seminar was originally scheduled for Thursday the 24th of November 2005, but was cancelled two days beforehand by the University of Canberra.
Research Proposal for the Award of Doctor of Philosophy (Communication Specialisation)

1/01/2006 - 31/12/2009
PhD Timeline

1/01/2006 - 20/09/2006
Phase One: Preliminary Requirements

2/10/2006 - 31/12/2008
Phase Two: Data Collection and Analysis

5/01/2009 - 4/12/2009
Phase Three: Thesis and Report Production

1/01/2006 - 20/09/2006
Phase One: Preliminary Requirements

9/02/2006
Step 1: Present the research proposal seminar

1/05/2006 - 22/07/2006
Step 4: Conduct a pilot study

Step 2: Gain approvals and permissions
23/03/2006 - 28/04/2006

Step 3: Design the research instruments
23/03/2006 - 28/04/2006

Step 5: Refine the research Instruments and methods

Figure 4: Phase one timeline
Research Proposal for the Award of Doctor of Philosophy (Communication Specialisation)

1/01/2006 - 31/12/2009
PhD Timeline

1/01/2006 - 20/09/2006
Phase One: Preliminary Requirements

23/09/2006 - 6/01/2009
Phase Two: Data Collection and Analysis

11/01/2009 - 4/12/2009
Phase Three: Thesis and Report Production

1/01/2006 - 20/09/2006
Phase Two: Data Collection and Analysis

3/10/2006 - 31/12/2008
Step 6: Conduct the first organisation-wide survey
Step 8: Lead the initial focus group
30/01/2007 - 24/02/2007
Step 10: Conduct semi-structured interviews
31/05/2007 - 20/06/2007
Step 12: Develop a conceptual model and theory
1/12/2007 - 28/02/2008
Step 14: Design the second organisation-wide survey
30/03/2008 - 1/05/2008
Step 16: Do the final data analysis
30/06/2008 - 27/09/2008
Step 15: Conduct the second organisation-wide survey
4/05/2008 - 27/06/2008
Step 17: Develop the substantive theory and model
30/09/2008 - 30/12/2008

Step 7: Do the initial data analysis
31/10/2006 - 20/01/2007
Step 9: Do the second data analysis
27/02/2007 - 27/05/2007
Step 11: Do the third data analysis
Step 13: Lead the second focus group
2/03/2008 - 27/03/2008

Figure 5: Phase two timeline
Figure 6: Phase three timeline

1/01/2006 - 31/12/2009
PhD Timeline

1/01/2006 - 20/09/2006
Phase One: Preliminary Requirements

23/09/2006 - 6/01/2009
Phase Two: Data Collection and Analysis

11/01/2009 - 4/12/2009
Phase Three: Thesis and Report Production

1/01/2006 - 31/12/2009
PhD Timeline

5/01/2009 - 4/12/2009
Phase Three: Thesis and Report Production

Step 19: Write the thesis

Step 18: Write the organisation report
5/01/2009 - 27/02/2009

4/12/2009
Step 20: Submit the thesis for examination

Figure 6: Phase three timeline
6.3 **Risks and risk mitigation**

The research design and timetable have seven identified risks. The first risk, and the one with the most immediate impact, is non-approval of the research by the University of Canberra Ethics Committee because of privacy concerns associated with the social network analysis. Should this occur there will be no alternative other than to redesign the sample selection method and forsake the data that might have come from the analysis. If this occurs it will impose a time delay of several months.

The second risk is Land and Water Australia decline to take part in the pilot study. In this eventuality it is possible to conduct the pilot within the University of Canberra, given the intent of the pilot is to gain some mastery of the methods and tools, and to identify problems with the approach.

The third risk is Land and Water Australia make their participation in the pilot study contingent on a modification, or modifications, to the research design or instruments. Depending on the required modifications they may be accommodated. If they cannot be accommodated then it may be possible to conduct the pilot within the University of Canberra. In either case the effect of this risk will be to delay the timetable.

The fourth risk is the Australian Public Service Commission declines to take part in the main study. This risk is less problematic than the previous risks because there are many other suitable organisations. Indeed it may be possible, and desirable, to do the main study in the same organisation where the pilot study is conducted. In the worst case the effect of this risk if it occurs is to delay the timetable by several months while another organisation is approached and consent gained.

The fifth risk is the Australian Public Service Commission make their participation contingent on a modification, or modifications, to the research design or instruments. Again this will require another organisation to be identified, and will impose a delay of several months.
The sixth risk is no patterns can be detected from the data. To lessen this risk software tools will be used to aid in data analysis, and data will be coded independently by the researcher and another coder. Reasons for any inconsistencies will be discussed and reconciled. In the unlikely event that no patterns can be identified then the researcher will have no choice other than to report the findings as they are.

The seventh risk concerns the part-time research approach. Other commitments have the potential to delay the research timetable, and these other commitments will usually be unavoidable. To reduce the impact and to ensure the timetable remains practicable, the research will be monitored through monthly face-to face meetings, and e-mail contact as needed, with the University appointed supervisors. Should the research fall nine months or more behind the agreed timetable the researcher will consider doing the research under a full-time arrangement for a specified period.

### 6.4 Record management

The researcher will participate with and observe trusting individuals and groups. This carries with it the responsibility to protect individuals’ confidentiality and to ensure that their views are accurately represented. Further these individuals must have access to their records should they wish to access them. During the research phase all records will be stored in a Class B fire-proof combination safe located at the researcher’s private residence – this safe conforms to military security requirements for Secret data. Should someone want access to their records they will be provided with their records only. After the research is written up the records will be passed to the University of Canberra to maintain and archive as appropriate for the mandatory five year period.

---

23 This process is already underway.
Section 7  Conclusion

‘As often as a study is cultivated by narrow minds, they will draw from it narrow conclusions’.


In 1997 Peter Drucker recognised that ‘the most important contribution management needs to make in the 21st century is ... to increase the productivity of knowledge work and knowledge workers’ (Drucker, P 1999, p. 79). The focus of this research is on knowledge work and knowledge worker productivity. The scope of the proposed research is multi-disciplinary, and will draw upon the disciplines of philosophy, epistemology, management theory, public-sector management, policy development, systems engineering, chaos theory, change management, project management, and of course knowledge management. As a result of the integration of different disciplines, plus the research methodology, a model and theory of public-sector knowledge productivity will be developed. The research will provide a foundation for public-sector organisations to improve their effectiveness and efficiency.
Appendix 1  Research Mind Map

Figure 7: Research mind map
Appendix 2  Output from NetMiner®

This is one example of the many visualisations that NetMiner® can provide. Quantitative analysis is possible from within the tool, or data can be exported into other packages such as SPSS® or Microsoft® Excel. The relevance of the tool to this research is the ability to map, visualise and analyse the actual knowledge, information and data flows within the organisation.

Figure 8: Output from NetMiner® (produced from researcher’s experimental data)
Appendix 3  Output from Semantica®

This is an example of the output of Semantica®. Any of the blue boxes can be clicked upon, which then makes that box the central concept. It is also possible to embed documents, comments and images in any of the boxes. The relevance of the tool to this research is the ability to map and visualise concepts on the fly in a workshop. The tool’s disadvantage is the inability to view the total concept. Notwithstanding this limitation the tool is very simple to use and produces output that can be immediately agreed.

Figure 9: Output from Semantica® (produced from researcher’s experimental data)
Appendix 4    Output from CmapTools®

This is an example of the output of CmapTools®. It is possible to embed documents, comments and images in any of the boxes. It is also possible to collapse parts of the diagram or embed other concept maps. The relevance of the tool to this research is the ability to map and visualise concepts on the fly in a workshop, and to later share the concept map over the web.

Figure 10: Output from CmapTools® (accessed from http://cmap.ihmc.us/)
Appendix 5  Outline Thesis Structure

Figure 11: Outline thesis structure
## APPLICATION FOR APPROVAL TO CONDUCT RESEARCH WITH HUMAN PARTICIPANTS

### PART 1 – ABOUT THE APPLICANT

<table>
<thead>
<tr>
<th>APPLICANT</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Title</td>
<td>Given names</td>
<td>Family Name</td>
<td></td>
</tr>
<tr>
<td>Mr</td>
<td>Graham Alan</td>
<td>Durant-Law</td>
<td></td>
</tr>
<tr>
<td>Postal address for</td>
<td>Mr Graham Durant-Law</td>
<td></td>
<td></td>
</tr>
<tr>
<td>correspondence</td>
<td>care of Post Office Box</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3076</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Manuka ACT 2603</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Telephone:</td>
<td>Work Home and Business</td>
<td>Mobile</td>
<td>Fax number</td>
</tr>
<tr>
<td></td>
<td>02 6255 9319</td>
<td>0408 975 795 (preferred)</td>
<td>02 62 559349</td>
</tr>
</tbody>
</table>
### Research Proposal for the Award of Doctor of Philosophy (Communication Specialisation)

**E-mail - Please provide an e-mail address (staff, student or private).**

graham@durantlaw.info (private)

<table>
<thead>
<tr>
<th>Status:</th>
<th>Staff /number</th>
<th>Not applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Student/ID</td>
<td>u118254</td>
</tr>
</tbody>
</table>

**If a student, please state course of study:**

Doctor of Philosophy (Communication Specialisation)

**Qualifications**

BSc, MHA, MKM, Grad Dip Def, Grad Dip Mngt, Grad Cert Hlth Fin

**Field of expertise**

Knowledge and information management. Health administration.

### UNIVERSITY OF CANBERRA SUPERVISOR (If Applicant is a student)

<table>
<thead>
<tr>
<th>Title</th>
<th>Given names</th>
<th>Family Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Associate Professor</td>
<td>Patricia Anne</td>
<td>Milne</td>
</tr>
</tbody>
</table>

**School**

School of Languages, International Studies and Tourism

**Academic Division**

Division of Communication and Education

<table>
<thead>
<tr>
<th>Telephone:</th>
<th>Work</th>
<th>Home</th>
<th>Fax number</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(02) 6201 2053</td>
<td>Not Applicable</td>
<td>(02) 6201 2649</td>
</tr>
</tbody>
</table>

**Qualifications**

BA, Grad Dip Arts, MA, PhD

Copyright © Graham Durant-Law 2006
## PART 2 – ABOUT THE PROJECT

### SECTION 2A GENERAL INFORMATION

#### 1. PROJECT TITLE

A Knowledge Productivity Model for the Public-Sector

#### 2. TYPE OF PROJECT

<table>
<thead>
<tr>
<th>(a) Is your project</th>
<th>Teaching</th>
<th>Research</th>
</tr>
</thead>
<tbody>
<tr>
<td>Please place an ‘X’ in the appropriate box.</td>
<td>N/A</td>
<td>X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(b) Is your project</th>
<th>New</th>
<th>Continuing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>X</td>
<td>N/A</td>
</tr>
</tbody>
</table>

#### 3. DURATION OF PROJECT

<table>
<thead>
<tr>
<th>(a) Starting date of this project (day/month/year)</th>
<th>1st May 2006</th>
</tr>
</thead>
</table>

The Committee cannot grant retrospective approval. The starting date provided on this form should postdate the meeting at which the application will be considered by a minimum of one week. Note that if approval is not granted at the meeting, this date may need to be amended.

<table>
<thead>
<tr>
<th>(b) Anticipated completion date for total project (day/month/year)</th>
<th>31st December 2009</th>
</tr>
</thead>
</table>

This date will become the expiry date for your approval.

#### 4. ACADEMIC DISCIPLINE

<table>
<thead>
<tr>
<th>Identify the academic discipline to which your project belongs.</th>
<th>Knowledge Management / Management Science</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. PREVIOUS APPLICATION</td>
<td></td>
</tr>
<tr>
<td>-------------------------</td>
<td></td>
</tr>
<tr>
<td>(a) Is this project related to a previous application?</td>
<td>Yes N/A</td>
</tr>
<tr>
<td>(b) If YES, please quote the project number:</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>6. REPEAT PROJECT</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Does this project repeat a previous study?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>7. ALTERNATIVE METHODS</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Could the purpose of this investigation be achieved by an alternative method?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>8. FINANCIAL SPONSORSHIP</th>
</tr>
</thead>
<tbody>
<tr>
<td>If the project is the subject of a funding application, identify:</td>
</tr>
<tr>
<td>(a) the amount of funding</td>
</tr>
<tr>
<td>(b) the funding body</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>9. RESEARCH SITES</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Will any part of this project be carried out at another institution (eg local school, hospital, other university, etc?)</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

If any part of the project will be carried out at another institution, evidence of its approval must be provided to the Committee before the project commences.
(b) If YES, please identify the institution(s), then go to (c).

<table>
<thead>
<tr>
<th>Institution(s)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Land and Water Australia (pilot)</td>
<td></td>
</tr>
<tr>
<td>Australian Public Service Commission (main study)</td>
<td></td>
</tr>
</tbody>
</table>

(c) Does the institution have a human research ethics committee?

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>N/A</th>
<th>No</th>
<th>X</th>
</tr>
</thead>
<tbody>
<tr>
<td>Go to (d)</td>
<td>Go to (e)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(d) If YES, has approval been granted by its ethics committee?

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>N/A</th>
<th>Pending</th>
<th>N/A</th>
</tr>
</thead>
</table>

(e) If NO, has written approval been provided by the institution?

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>N/A</th>
<th>Pending</th>
<th>X</th>
</tr>
</thead>
</table>

**SECTION 2B  PROJECT DETAILS**

10. AIM

Describe, in general terms, the aims and/or hypotheses of the project. This should be a short statement which you will be asked to expand on in your answers to the following questions.

The aim of this research is to document what knowledge means for a Canberra-based public-sector organisation, so a theory and model of knowledge productivity, including a means for measurement, can be developed.

The specific problem to be addressed is ‘How can public-sector organisations enable knowledge for improved productivity and positive exploitation?’

11. RESEARCH CONTEXT

Summarise the main research reported on this topic, showing how it supports your proposed study. Please do not cut and paste from your thesis proposal, but clearly outline the contribution your project will make to the research in this area (maximum two pages, including references).
See ‘Section 2 A Preliminary Literature Review’. A summary will be developed after approval to proceed with the research is granted.

Management theory is developing quickly. Knowledge management theory is still in its infancy, with little empirical research available on the application of theory to the workplace. This research will provide an empirical basis to assist organisations to determine what data, information and knowledge actually means for them, and in so doing should allow them to select an appropriate management intervention. In so doing it will fill a significant gap in the literature, and brings with it the promise of more efficient use of public monies by organisations utilizing the research findings.

This research will produce a model of public-sector knowledge productivity, rather than a model of knowledge. The model of knowledge productivity will include implementation, maintenance and sustainment components. Further this research will contribute to the knowledge management discipline by providing a complete end to end example of a knowledge productivity intervention, as well as providing a basis for a public-sector organisation to evaluate their existing knowledge management solutions. Finally, the research outcomes will provide a theoretical construct that will allow knowledge practitioners to practice with confidence.

### SECTION 2C METHODOLOGY

12. METHOD

In language that a person from outside your discipline can understand, describe the following:

(a) Project design.

Explain how you intend to carry out the project, including a schedule of events with approximate dates.

See ‘Section 5 Methods and Approach’ for the project design and ‘Sub-section 6.2 Timetable’ for the schedule. A summary will be developed after approval to proceed with the research is granted.

The strategy to be employed in this research is a case study, which employs a phased approach based on soft systems methodology and grounded theory. Phase one encompasses all the preliminary requirements to gain approval for the research, as well as instrument design, and the conduct of a small pilot. Phase two involves data collection and analysis. Focus groups, surveys and personal interviews will be used, along with a number of software tools to aid analysis. Model and theory development will be developed in parallel. Phase three is the write up of the thesis and the production of a report for the organisation that was researched.
(b) **Data collection methods**

(Attach all questionnaires/surveys or test sheets in their final form).

Describe specific procedures to be used, including times involved per session and number of sessions per participant. Name the attachment “Attachment Q12(b)”.

See 5.4 Research design for the data collection methods. A summary will be developed after approval to proceed with the research is granted.

Questionnaires and survey forms are still under development.

(c) **Analysis of data**

Describe how you intend to analyse the data considering privacy issues as per the Human Ethics Manual.

See ‘5.4 Research design’ for the data analysis methods. A summary will be developed after approval to proceed with the research is granted.

13. **UNFORESEEN EVENTS**

(a) **Is the project likely to cause adverse reaction in the participants, including emotional distress? If so, indicate the arrangements you have made to support the participants.**

Please note that if follow-up counselling is required, it must be provided by an independent service – the applicant/supervisor must not be involved. Follow-up counselling must be a free service.

No

(b) **Does the project create a need for medical arrangements to handle emergencies? If so, briefly describe the provisions you have made for these arrangements.**

No

14. **PARTICIPANTS’ ACCESS TO RESULTS**

Describe what arrangements are proposed to inform participants of the results of the project.
She should someone want access to their records they will be provided with their records only. After the research is written up the records will be passed to the University of Canberra to maintain and archive as appropriate for the mandatory five year period.

SECTION 2D  DETAILS ABOUT PARTICIPANTS

15. DESCRIPTION

(a) Participants in the project.
How many people will be involved? Less than 100.

(b) Selection criteria
What categories of people will you be seeking (eg preschool teachers, midwives, hockey players).
Public servants from ASO 1 to SES 1.

(c) What age range will your participants cover? 18 to 65 years.

(d) Do you intend to exclude certain categories of people?
If you do, briefly outline who is to be excluded from the project and the reason for the exclusion,(eg with specific medical conditions). Please note excluding conditions may need to be specified in the Information for Participants document.
No

(e) Cultural/social considerations
Outline how cultural or social backgrounds of proposed participants have affected the design of the project and/or the way it will be conducted.
To be developed.

16. RECRUITMENT

Please explain how participants will be recruited? Include where these participants will be recruited form.

Please attach written information for participants eg letter of invitation or bulletin board advertisement etc. Please name the attachment “Attachment Q16”. This attachment must clearly outline what you expect of your participants and any risks/benefits of your project to them.

Additional documentation attached Yes ☑ No ☒

A web-enabled organisation-wide survey will be used to identify and target those individuals that are the central connectors, knowledge brokers, and boundary spanners of the organisation, where: a central connector is ‘someone who is highly connected to many others in the network, who may be either a key facilitator or a gatekeeper’; a broker is ‘someone who communicates across sub groups’; and a boundary spanner is a ‘person who connects a department with other departments’. The intent is to invite these individuals to participate in several focus groups, surveys and personal interviews during the course of the research, because these individuals already understand data, information and knowledge flows within the organisation.

Letters of invitation are yet to be developed.

17. DEPENDENT RELATIONSHIPS

(a) Are there any ways in which participants are dependent on you/your supervisor?

Yes ☒ No ☒

If YES, explain the nature of the dependent relationship and what procedures have you put in place to protect the participants?

18. INDUCEMENT TO PARTICIPANTS

© Graham Durant-Law 2006
### 19. USE OF UNIVERSITY OF CANBERRA STUDENTS AS PARTICIPANTS

<table>
<thead>
<tr>
<th>(a) Is the project part of a curriculum requirement in a University of Canberra subject?</th>
<th>Yes</th>
<th>N/A</th>
<th>No</th>
<th>X</th>
</tr>
</thead>
<tbody>
<tr>
<td>If NO, go to Q. 20.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### SECTION 2E INFORMED CONSENT

#### 20. INFORMED CONSENT

**(a) Procedures**


Describe procedures for obtaining informed consent of participants and/or others involved. There should be evidence that every effort will be made to fully inform the participants of the nature of the project, and to assure their understanding of it. If for any reason written consent is not considered suitable, put a case to the Committee for its waiver.

Appendix 7 shows the Form of Consent. Participants will have the intent of the research and the desired outcome explained to them. If they are still interested the data collection methods will be explained to them and they will be asked to read and sign the Form of Consent.

#### (b) Documentation

Attach information provided for the purpose of obtaining informed consent, and form(s) to be signed by the participant, or parent, or guardian. Details required in informed consent documentation are outlined in the Human Ethics Manual. Name the attachment “Attachment Q20 (b)”.  

| Information sheet(s) attached | Yes | X | No | N/A |
Informed consent form(s) attached | Yes X | No N/A

SECTION 2F PRIVACY, CONFIDENTIALITY & DATA PROTECTION

21. PRIVACY

How will the privacy of participants be protected?

Refer to the information on privacy in the Human Ethics Manual. Personal information on participants must be kept confidential. Note that although the NHMRC Privacy Guidelines apply only to medical research involving personal information obtained from Commonwealth agencies, it is recommended that the guidelines be applied to all research involving the use of personal information.

Steps four and six of this research design make use of social network analysis techniques, which bring with them problems of anonymity. In order to construct the network it is necessary for survey respondents to provide their name and the names of the people they interact with. Even if someone declines to participate it is likely that others will use their name and indicate they have some sort of network relationship, which means that non-response does not guarantee omission from the study.

To cater for the anonymity problem those individuals that do not wish to participate will be completely removed from the network data. In the final network diagram that will be published pseudonyms will be substituted for real names, and only senior management will be shown the actual network diagrams with the real data. Respondents who wish to see their own data will have the right to see their own data to confirm correctness. This means that that they will only see names in their immediate neighbourhood and that they are directly connected to.

To ensure the data is not used in an unintended way by the organisation the Chief Executive Officer, or equivalent, will be asked to sign a ‘Management Disclosure Contract’ specifying that the data will not form the basis for evaluation of individual employees, but will only be used in a developmental way to improve the functioning of the organisation.

22. USE OF RESTRICTED INFORMATION

Are you intending to use existing records which identify individuals, but which are not normally available to the public? Yes N/A No X

Go to Q23 Go to Q24

Examples of such information are medical records, personal diaries, computer data or names and addresses from any non-public source.
## 23. DETAILS OF RESTRICTED INFORMATION

(a) Describe the type(s) of restricted records to be used.

Not applicable.

(b) Which individuals or organisations control access to the restricted information?

Not applicable.

<table>
<thead>
<tr>
<th>(c) Is any organisation listed in (b) a Commonwealth agency?</th>
<th>Yes</th>
<th>N/A</th>
<th>No</th>
<th>N/A</th>
</tr>
</thead>
</table>

For the purposes of the Privacy Act, a Commonwealth agency is, subject to certain exceptions, any Minister, Department, statutory corporation or other body established for a public purpose by Commonwealth legislation (including federal or ACT courts, and the Australian Federal Police). Further information is available in the Human Ethics Manual.

(d) Has the organisation agreed to provide or allow access to the restricted information?

Yes  N/A  Pending  N/A

(Letter attached)

Written permission from the organisation must be submitted to the Committee before your project commences.

(e) State any conditions imposed by the organisation on the release of information.

Not applicable.

<table>
<thead>
<tr>
<th>(f) Will you have access to identifying information about any individual?</th>
<th>Yes</th>
<th>N/A</th>
<th>No</th>
<th>N/A</th>
</tr>
</thead>
</table>

You must answer YES if you will be able to match names to information or opinions contained in the records.

Go to (g)  Go to Q25

<table>
<thead>
<tr>
<th>(g) If YES, will the consent of those individuals be sought by the researcher?</th>
<th>Yes</th>
<th>N/A</th>
<th>No</th>
<th>N/A</th>
</tr>
</thead>
</table>

Go to Q25  Go to (h)
(h) If NO, explain why not, and how those participants will be protected from having identifying information made public.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Not applicable.</td>
<td></td>
</tr>
</tbody>
</table>

### 24. APPLICABILITY OF THE PRIVACY ACT

Does the Privacy Act apply to your data collection?  
If you answered YES to questions 23(c) and 23(f), your answer to this question must be YES. This information is required for annual reporting to the Australian Health Ethics Committee of the National Health and Medical Research Council.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>X</td>
</tr>
<tr>
<td>No</td>
<td></td>
</tr>
<tr>
<td>N/A</td>
<td></td>
</tr>
</tbody>
</table>

### 25. DATA SECURITY

Indicate your compliance with University policy relating to retention and storage of data associated with research projects:

Information on University policy (Guidelines for Responsible Practice in Research and Dealing with Problems of Research Misconduct) is included in the Human Ethics Manual.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Only the researchers (and the project supervisor, if applicable) will have access to the original data.</td>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
<td>N/A</td>
</tr>
<tr>
<td>(b) Paper records will be stored under lock and key, and electronic data will be stored on a password-protected computer.</td>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
<td>N/A</td>
</tr>
<tr>
<td>(c) All data will be stored at the University for the required period when the project is complete.</td>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
<td>N/A</td>
</tr>
</tbody>
</table>

**Storage period required**  
5 years

The required period is a minimum of five years in most cases. In the case of clinical data, 15 years may be more appropriate.

### 26. OFF-CAMPUS DATA STORAGE
(a) Will data will be stored off-campus (eg at your home) at any stage during the project?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Answer (b) & (c)*

Go to Q27

(b) If YES, where and how will the data be secured?

During the research phase all records will be stored in a Class B fire-proof combination safe located at the researcher’s private residence – this safe conforms to military security requirements for Secret data.

(c) If YES, when will all data be transferred to the University for final storage?

After the research is written up the records will be passed to the University of Canberra to maintain and archive as appropriate for the mandatory five year period.

---

**SECTION 2G – RISK AND BENEFIT ANALYSIS**

27 (a) Potential benefits

What is the potential value of the project for understanding human behaviour, and/or maintaining and improving human health and welfare, and/or achieving educational objectives.

This research will provide an empirical basis to assist organisations to determine what data, information and knowledge actually means for them, and in so doing should allow them to select an appropriate management intervention. In so doing it will fill a significant gap in the literature, and brings with it the promise of more efficient use of public monies by organisations utilizing the research findings.

This research will permit the development of a model of public-sector knowledge productivity, rather than a model of knowledge. The model of knowledge productivity will include implementation, maintenance and sustainment components. Further this research will contribute to the knowledge management discipline by providing a complete end to end example of a knowledge productivity intervention, as well as providing a basis for a public-sector organisation to evaluate their existing knowledge management solutions. Finally, the research outcomes will provide a theoretical construct that will allow knowledge practitioners to practice with confidence.
28. **RISKS**

What are the risks to the participants or the community of the proposed investigation. Are there any procedures which may cause discomfort, embarrassment or health hazard (including psychological health) to the participants (eg biomedical procedures, exercise to exhaustion, stressful procedures to elicit information) or are there any procedures designed to modify the knowledge, thinking, attitudes, feelings and/or behaviour of the participants.

See the answer to question 29. There are no other risks to participants.

29. **SPECIFIC ETHICAL CONSIDERATIONS**

What, in your opinion, are the unique ethical considerations in this project? (You may wish to comment, for example, on issues relating to informed consent, confidentiality etc.)

Steps four and six of this research design make use of social network analysis techniques, which bring with them problems of anonymity. In order to construct the network it is necessary for survey respondents to provide their name and the names of the people they interact with. Even if someone declines to participate it is likely that others will use their name and indicate they have some sort of network relationship, which means that non-response does not guarantee omission from the study.

To cater for the anonymity problem those individuals that do not wish to participate will be completely removed from the network data. In the final network diagram that will be published pseudonyms will be substituted for real names, and only senior management will be shown the actual network diagrams with the real data. Respondents who wish to see their own data will have the right to see their own data to confirm correctness. This means that they will only see names in their immediate neighbourhood and that they are directly connected to.

To ensure the data is not used in an unintended way by the organisation the Chief Executive Officer, or equivalent, will be asked to sign a ‘Management Disclosure Contract’ specifying that the data will not form the basis for evaluation of individual employees, but will only be used in a developmental way to improve the functioning of the organisation.

30. **BALANCE OF BENEFITS AND RISKS**

Outline the reasons which led you to be satisfied that the possible benefits to be gained justify any risks involved.

To be developed.
SECTION 2H ADDITIONAL INFORMATION

31. OTHER RELEVANT ISSUES

Please provide any additional information which may assist the Committee in its consideration of the project.

Not applicable.

SECTION 3 - DECLARATIONS BY APPLICANT(S)

I /We: (Print names) Graham Alan Durant-Law

Declare that I /we am /are qualified and authorised to perform procedures described in this document;

certify that the assistants involved in this project have been fully briefed on procedures and relevant ethical considerations;

am /are aware of the responsibilities set out in relevant legislation, national guidelines and University of Canberra policies (see the Human Ethics Manual);

undertake to inform the Committee of any changes to the proposed procedures or details given in this form subsequent to its submission; and

agree to assist the Committee to monitor the conduct of research by submitting project review reports as required.

<table>
<thead>
<tr>
<th>Applicant</th>
<th>Signature</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### SECTION 4 - DECLARATION BY SUPERVISOR

<table>
<thead>
<tr>
<th>I: (Print name)</th>
<th>Patricia Anne Milne</th>
</tr>
</thead>
<tbody>
<tr>
<td>Declare that I am qualified and authorised to supervise procedures described in this document; certify that the applicant(s) and assistants involved in this project have been fully briefed on procedures and relevant ethical considerations; and am aware of the responsibilities set out in relevant legislation, national guidelines and University of Canberra policies (see the Human Ethics Manual).</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Supervisor</th>
<th>Signature</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### SECTION 5 - DECLARATION BY HEAD OF SCHOOL

Note: If the Head of School is a researcher or supervisor of the project, this section should be signed by the Pro Vice-Chancellor of the Academic Division.

<table>
<thead>
<tr>
<th>I: (Print name)</th>
<th>Andrew Cheetham</th>
</tr>
</thead>
<tbody>
<tr>
<td>Declare that the qualifications and experience of the applicants and supervisors are appropriate to the procedures to be performed in accordance with this application.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pro Vice-Chancellor of the Academic Division</th>
<th>Signature</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix 7  Draft Consent Form24

Introduction

The aim of this research is to document what knowledge means for a Canberra-based public-sector organisation, so a theory and model of knowledge productivity, including a means for measurement, can be developed.

The specific problem to be addressed is ‘How can public-sector organisations enable knowledge for improved productivity and positive exploitation?’

The research includes a social network study in which I will try to map out the communication network of Land and Water Australia

Goals

The immediate goal of this survey is to understand who talks to whom. I am trying to identify highly connected individuals to participate in subsequent focus groups, and questionnaires. Your participation will also allow me to correctly express my research questions in preparation for the main study.

Land and Water Australia’s goal in this study is to improve communication in areas that need it.

Procedures

You will be asked to fill out an online survey about who you interact with regularly, along with background information about yourself, such as training, the department you’re in, and so on.

Part one of the questionnaire is designed to identify the highly connected people in Land and Water Australia, as well as the data, information and knowledge flows of the organisation. The type of question posed in this section will be along the lines of - ‘Who do you ask when you have a question involving …?’

Part two of the questionnaire will pose some opened ended questions along the lines of:

- ‘What type of knowledge is needed to do your work?’
- ‘What is the difference between knowledge and information for you in your work?’
- ‘What does your organisation mean by the term knowledge management?’

Part three will collect some demographic and biographical data.
The survey should take no more than 30 minutes to complete. In order to map out who talks to whom, I will need you to give me your name when filling out the survey.

Once the data have been collected, I will construct social network maps like this one:

Note that the map contains each person’s name. These maps will be shown to senior management (specifically, Mr Andrew Campbell, Dr Nick Schofield, Mr Anwen Lovett, Mr Tom Aldred, Mr Michael Lester, Ms Kate Andrews, and Mr Chris de Mamiel), but will not be shown to others in Land and Water Australia.
In addition, I will calculate network metrics such as calculating the ‘degrees of separation’ between pairs of people –that is the length of the network paths from one person to another.

Risks and costs

Since senior management will see the results of this study, there is a chance that someone in management could consider your set of communication contacts to be inappropriate for someone in your position, and could think less of you. Please note, however, that I have obtained a signed agreement from Mr Andrew Campbell, stipulating that the data will only be used for improving communication in Land and Water Australia and will not be used in an evaluative way.

Individual benefits

I will provide you with direct, individualised feedback regarding your location in the social network of the organisation.

Withdrawal from the study

You may choose to stop your participation in this study at any time. If so, you will not appear on any of the social network maps and no metrics will be calculated that involve you. Note that Land and Water Australia management has agreed that participation in the study is voluntary.

Confidentiality

As explained above, your participation will not be anonymous. In addition, senior management will be able to see results of the study that include your name. Outside of senior management, however, the data will be kept confidential. Any publicly available analyses of these data will not identify any individual by name, nor identify Land and Water Australia


**Participant’s certification**

I have read and I believe I understand this Informed Consent document. I believe I understand the purpose of the research project and what I will be asked to do. I understand that I may stop my participation in this research study at anytime and that I can refuse to answer any question(s). I understand that senior management and only senior management will see the results of this research with individuals identified by name.

I hereby give my informed and free consent to be a participant in this study.

(Cross out if not applicable).

I hereby exercise my right not to participate in this study.

(Cross out if not applicable).

Signed

Participant

29 January 2006

**Researcher’s certification**

I agree to conduct the study in accordance with the constraints imposed by this document.

Signed

Graham Durant-Law

29 January 2006
Appendix 8  Draft Management Disclosure  
Contract

UNIVERSITY OF CANBERRA  
COMMITTEE FOR ETHICS IN HUMAN RESEARCH

OFFICE USE ONLY

| NAME |  |
| PROJ NO. |  |

Study authorisation

This document authorises Graham Durant-Law to conduct a pilot study, which includes a social network analysis, at Land and Water Australia during the period 1 May 2006 to 31 August 2006 inclusive.

The aim of the research is to document what knowledge means for a Canberra-based public-sector organisation, so a theory and model of knowledge productivity, including a means for measurement, can be developed.

The specific problem to be addressed is ‘How can public-sector organisations enable knowledge for improved productivity and positive exploitation?’

---

Rights of the researchers

The data – properly anonymised so that neither the individual nor Land and Water Australia are identified – will form the basis of scholarly publications.

Rights of the Land and Water Australia

In addition, Graham Durant-Law will furnish Land and Water Australia with a copy of all the data. Land and Water Australia agrees that the data will not be shared among the employees and will only be seen by senior management. Land and Water Australia agrees that the data will not form the basis for evaluation of individual employees, but will be used in a developmental way to improve the functioning of Land and Water Australia.

Rights of the participants

The participants of the survey – the people whose networks are being measured – shall have the right to see their own data to confirm correctness. They may also request a general report from the researchers that does not violate confidentiality of the other participants regarding what was learned in the study.

Signed

Andrew Campbell
for Land and Water Australia

29 January 2006

Signed

Graham Durant-Law

29 January 2006
Appendix 9    References


Blacker, F 2002, 'Knowledge, knowledge work, and organizations', in CW Choo & N Bontis (eds), The strategic management of intellectual capital and organizational knowledge, Oxford University Press, New York, pp. 47-64.


CEN 2004a, European guide to good practice in knowledge management - part 3: SME implementation, European Committee for Standardisation.

Research Proposal for the Award of Doctor of Philosophy (Communication Specialisation)

---- 2004c, European guide to good practice in knowledge management - part 1: knowledge management framework, European Committee for Standardisation.

---- 2004d, European guide to good practice in knowledge management - part 5: KM terminology, European Committee for Standardisation.

---- 2004e, European guide to good practice in knowledge management - part 2: organizational culture, European Committee for Standardisation.


Debowski, S 2006, Knowledge management, John Wiley and Sons, Milton, Queensland.

Despres, C & Chauvel, D 2000, 'Thematic analysis and design of knowledge systems and processes ', in C Despres & D Chauvel (eds), Knowledge horizons: the present and the promise of knowledge management, Butterworth Heinemann, Boston, pp. 55-86.


Research Proposal for the Award of Doctor of Philosophy (Communication Specialisation)


Research Proposal for the Award of Doctor of Philosophy (Communication Specialisation)


Liebowitz, J & Beckman, T 1998, Knowledge organizations: what every manager should know, St. Lucie Press.


Research Proposal for the Award of Doctor of Philosophy (Communication Specialisation)


Miller, R 2006, 'Model-driven projects in the chemical industry: why using knowledge models is becoming more popular', *Knowledge Management Review*, vol. 8, no. 6, pp. 28-31.


Sparks, JN 1997, *Soft operational research techniques for the acquisition and management of logistics*, Department of Defence, Canberra.


Tare, M 2003,'A future for human resources: a specialised role in knowledge management', doctoral thesis, Swinburne University of Technology.


