

**A New Framework for Defining, Identifying and Explicating Tacit
Knowledge: Qualitative Research using Aspectual Analysis on SMEs**

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Abstract

Area of Concern: There is a growing awareness that tacit knowledge accounts for a substantial portion of vital knowledge in both individuals and organisations. The advent of knowledge and organisational management frameworks has brought about a realisation that the difficulty of managing tacit knowledge is primarily due to a wide variety of conflicting definitions in both philosophy and scientific theories (Gourlay, 2004). These conflicts in literature are yet to be resolved by current frameworks, particularly those that examine the models of tacit knowledge flow in organisations. This indicates that a gap exists for creating a new foundation for identifying tacit knowledge. For this to be achieved, empirical data has been collated in the form of perceptions of personnel at two SME organisations in Manchester. The research has obtained these perceptions through semi-structured qualitative interviews. These interviews form the necessary data for analysis that has been carried out using the method of **aspectual analysis**. Aspectual analysis derives from the principles of Herman Dooyeweerd's theory of modal aspects, and has been the primary form of analysis of the data collected. By utilising these modal aspects, and applying Dooyeweerd's theory of knowing to the concept of tacit knowing; this research aims to identify different forms of tacit knowledge and their varying degrees of explication. This research may in turn be used to unite the views of tacit knowledge in literature, and propel the current discourse into a more constructive narrative that the researcher hopes will aid greater understanding of the importance of tacit knowledge. It may also be used as a base for the extension of literature in areas where knowledge is paramount such as organisational learning and the creation of frameworks for managing tacit knowledge in both organisational & knowledge management.

This issues discussed thus lead to the researcher asking the question:

“How can Dooyeweerd’s philosophy be used to analyse the tacit knowledge held by a variety of people of at an SME thus revealing the different types of tacit knowledge and discerning which types can be explicated?”

In answering this main research question, the research has achieved three main contributions that can be described as: Theoretical, Practical, and Methodological.

Theoretical Contribution: The research performed a review of both philosophical and practical literature on tacit knowledge showing that there is no agreed foundation for defining, identifying or explicating tacit knowledge. In terms of philosophical review of the nature of tacit knowledge, authors such as Yu (2004)’s Wittgenstein examination of Polanyi’s tacit knowing encompasses detailed review of philosophical underpinnings of tacit knowing, but ultimately limited scope of the types of tacit knowing and exploration of their differing levels of explication. This research expands this thinking and shows how these different areas can be articulated. In the case of practical literature, authors such as Gourlay (2002;2004) show how different empirical researchers define tacit knowledge differently, yet do not go further into stating that this are different types of tacit knowledge being discussed. The conflict is illuminated, but the theoretical frameworks for accounting for differences in tacit knowledge views tends to exclude rather than include important observations. This research shows how different views of tacit knowledge can be unified within a singular framework as guided by Dooyeweerd’s modal aspects.

Practical Contribution: As Gourlay (2004) notes, different empirical studies have taken multiple interpretations of tacit knowledge in their research, thus resulting in ambiguity on the nature of tacit knowledge in research. Gourlay review shows that two of the main differences in literature concerning the nature of tacit knowledge is whether tacit knowledge

is individually or collectively held and whether it can be made explicit. In addressing the first problematic of individually or collectively held tacit knowing, the research in this thesis shows how different types of tacit knowledge are held in a spectrum with some individually held, and others collectively held and also some with both a collective and individual component of knowing. In the second problematic of explication, the research creates a framework that shows how some forms of tacit knowledge can be explicated to varying degrees within the spectrum of different types of tacit knowing while utilising aspectual analysis and the property of inter-aspect reaching out.

Methodological Contribution: The research expands on utilising Dooyeweerd’s philosophy to illuminate scientific fields in this case applying the theory of modal aspects in conjunction with the property of inter-aspect reaching out within the modal spheres to reveal the forms of tacit knowledge that exists behind “the making of a statement”, and the tacit knowledge that exists “behind the content of the statement” within an interview setting. This is an expansion of aspectual analysis that is described by authors such as Winfield (2001) & Basden (2008).

Key Words: Tacit Knowledge, SME, Explication, Herman Dooyeweerd, Qualitative Research, Interpretive & Socio-Critical Research, Aspectual Analysis, Knowledge Management Framework

Chapter 1: Introduction

1.1 Introduction

This chapter provides an overview of the thesis covering the reasons behind conducting the research into tacit knowledge held in organisations. It gives a background on how the nature of tacit knowledge in literature has evolved as the world has moved towards a knowledge based society. Additionally, it introduces different types of tacit knowledge as described in literature and gives reasoning behind why we need to identify the different types of tacit knowledge. Moving on from this, it summarises the issue of explication controversy of tacit knowledge and outlines the rationale and scope of the research. Finally it declares the main research aim of the thesis and the objectives that need to be completed in order to achieve this aim.

1.2 Background of Research

According to Virtanen (2011), in the early period of the 1990's, knowledge became the most important resource of production and economy of organisations. Toffler (1990) as cited by Nonaka et al. (2000), claimed that “we now live in a knowledge-based society where knowledge is the source of highest quality power.” Stewart (2001) deduced that this meant placing knowledge assets at a position of higher importance to an organisation than physical or financial assets meant that new management techniques, technologies and strategies would be needed. Nonaka & Takeuchi (1995) further emphasised the advent of this knowledge-centric age when they concluded that learning and creation of new knowledge was of prime importance for an organisation. The shift from an industrial society to a knowledge based society elevated knowledge management to be one of the most influential organisational practices (Johannessen, et al., 2001).

Contemporary knowledge management asserts that there are two kinds of knowledge: tacit knowledge and explicit knowledge (Nonaka & Takeuchi, 1995). This is adopted from Polanyi (1958) dissection of personal knowledge where he coins the phrase ‘tacit’ knowledge to account for knowledge that is difficult to articulate as opposed to explicit knowledge which is knowledge that can be readily articulated in formal language and transmitted across individuals easily.” For Polanyi (1958), tacit knowing is the dominant principle of all knowledge. Polanyi (1966) summarises the notion of tacit knowing with the famous phrase, “we know more than we can tell.”

With the need for knowledge to be strategically managed by firms, a realisation that tacit knowledge makes up a large proportion of this knowledge has led to greater interest in the research into its constitution. Nonaka & Takeuchi’s (1995) theory of organisational knowledge creation is considered one of the main proponents that has made the idea of tacit knowledge in organisations popular concept. A key challenge for organisations arises from whether it is possible to manage tacit knowledge and ultimately harness it into explicit knowledge (Irick, 2007).

The rapid changes in the economic environment have brought the issue of organisational knowledge as the only sustainable source of competitive advantage (Horvath, 2000). In effect, tacit knowledge forms the basis of organisational knowledge. Thus, tacit knowledge is viewed as a key lever to achieving innovation success within a firm (Seidler-de Alwis & Hartmann, 2008).

1.2.2 Tacit Knowledge & SMEs

According to a business statistics report by Rhodes (2016) presented to the House of Commons in the UK, there were 5.5 million businesses in the UK in November 2016. Of these, 99% of the businesses were Small or Medium sized businesses employing 0-249

people. SMEs are a vital part of any national economy. According to the Organisation for Economic Cooperation and Development, SMEs are responsible for employing 60-70 percent of a nation's workforce (OECD, 2002).

In establishing the importance of SMEs, then it is essential to focus on what or how to make them succeed. As Ngah & Jusoff (2009) describe, researchers and practitioners alike advocate knowledge sharing as one of the primary resources of the knowledge economy. Knowledge sharing leads to knowledge accumulation, dissemination and acquisition. Within this knowledge based economy, knowledge is widely considered as the most important organisational resource and therefore critical for the long term sustainability of competitive advantage and success of any organisation (Alavi & Leidner, 2001; Davenport et. al 1998; Nonaka & Takeuchi 1995). If knowledge is the most crucial resource, then its nature must be explored; and within organisational and knowledge management literature, the debate ranges on the dichotomy of knowledge in its tacit and explicit dimensions. Recent developments on the notion of knowledge sharing have ventured into the tacit element of knowledge, such as Pathirage et. al (2007), but have not been fully explored. Nonaka & Takeuchi (1995) as cited by Ngah & Jusoff (2009), argue that tacit knowledge is the one that creates competitive advantage for organisations.

Cohen & Kaimnekais (2007) assert that the nature of knowledge in SMEs is almost completely tacit in nature. The influential research of Nonaka & Takeuchi (1995) proclaim that the flow from tacit to explicit knowledge is essential for the success of an organisation, but Wong & Radcliffe (2000) differ in stating that this transition is incredibly difficult within SMEs, and thus advises that sharing this tacit knowledge is the preferred way to aid SMEs in improving performance; particularly when tacit knowledge sharing would take place during socialisation and other informal ways where SMEs have efficient and informal communication networks (Egbu et al, 2005) as cited by Ngah & Jusoff (2009). Although

there is merit in proclaiming that sharing of tacit knowledge can somehow overcome the process of making tacit knowledge explicit, the researcher will show that the process of sharing tacit knowledge itself is dependent on making tacit knowledge explicit sometimes inadvertently.

Tacit knowledge is often identified as a key intangible resource (Jacobson, 1990) and also a primary strategic attribute of certain human resources (Coff, 1999). However, as with many intangible resources the question arises as to whether tacit knowledge may be a source of sustained competitive advantage. Additionally, some authors characterise tacit knowledge as hidden or unstructured knowledge acquired over a period of time through experience, reflection and intuition showing the difficulty of extracting it compared to explicit knowledge (Davenport & Prusak, 2000; Nonaka & Takeuchi (1995). Others view tacit knowledge as a process (Alavi & Leidner, 2001; Chong et. al, 2011) and place emphasis on ways to nurture, share and sustain knowledge through open and informal learning approaches such as communities of practice (CoPs) and other forms of social interaction techniques.

However, this is not effective for SMEs. Beijerse (2000) asserts that SMEs often lack absorptive capacity because they have no formal strategy for developing, disseminating, sharing or applying knowledge. SMEs often struggle to participate in open innovation because of knowledge transfer issues that are brought about by organisational and cultural differences (Vrande et. al, 2009).

Ultimately, these challenges present an opportunity for the researcher to explore whether a new framework can be able to account for different forms of tacit knowledge within an SME, and more importantly facilitating knowledge sharing through the explication of tacit knowledge within the organisation.

1.3 Research Problems

In the arena of knowledge and organisational management, tacit knowledge has been relegated to the background in spite of its strategic importance; primarily due to technology being limited to the transfer of explicit knowledge (Johannessen, et al., 2001). A greater emphasis in this arena has been placed on the explicable nature of tacit knowledge in relation to explicit knowledge which has in turn led to a static argument on how to actually measure tacit knowledge. Thus three major issues that have arisen in attempting to understand tacit knowledge:

- i.) How do you identify tacit knowledge?
- ii.) A wide variety of conflicting definitions of tacit knowledge.
- iii.) Whether it is possible to explicate tacit knowledge.

Identifying Tacit Knowledge: Due to the conflicting nature of definitions in literature, most of the empirical work that has been conducted into tacit knowledge faces criticism since it may only cover one form of tacit knowledge identification without catering to tacit knowledge as defined by other authors (Gourlay, 2004). Thus, one of the main factors of conducting the research in this thesis is to account for different types of tacit knowledge.

Variety in Definitions: Most of the literature focuses on the notion of whether tacit knowledge resides solely in an individual, in a social environment or resides in both. Howell (1996) emphasises that knowledge is non-codified and resides solely in an individual's performance of skill; while Hutchins (1995) indicates that knowledge resides not only in an individual, but also in the social workgroup to which they belong. The research aims to account for these definitions of tacit knowledge and resolve the conflict.

Ability to Explicate Tacit Knowledge: Conflicts have also arisen on the subject of explication of tacit knowledge. The authors are split on whether tacit knowledge can be

articulated at all; with some arguing that it is impossible to explicate tacit knowledge. Polanyi (1966) argues that tacit knowledge cannot be explicated while Nonaka & Takeuchi (1995), who use Polanyi as their philosophical foundation, define different types of tacit knowledge to account for its explication. This thesis aims to show what types of tacit knowledge can be explicated and identify the ones that are impossible to articulate.

In addition to these three main problems, we have to assess the research viability in an SME context:

SME Context: The ability to differentiate between different types of tacit knowledge and explicate them within an SME presents a difficult challenge due to their inherent nature. Tacit knowledge research in the context of organisational learning (“defined as creating, retaining and transferring knowledge within an organisation” Argote(1999)) is dependent on trust and shared norms of openness and reciprocity to facilitate progress (Dyer & Singh, 1998).

However, trust presents particular difficulties for SMEs who fear opportunistic behaviour from competitors and thus this lack of trust manifests itself in fear at both a personal and organisational level, and is a strong inhibiting factor for knowledge sharing in SME networks. As Pattinson et. al, (2011) states, “Individuals fear losing their expert status whereas organisations fear disclosure of their competitive advantage.” This distrust needs to be overcome or accounted for when performing research in an SME.

1.4 Focus of Research as Intended Solution to Research Problems

The advent of knowledge and organisational management frameworks has brought about a realisation that the difficulty of managing tacit knowledge arises from a wide variety of conflicting definitions in both philosophy and scientific theories. These conflicts in literature are yet to be solved by current frameworks, particularly those that examine the models of tacit knowledge flow in organisations. Thus, there exists a gap for creating a new foundation for identifying tacit knowledge and ultimately ascertaining its definition in literature.

In order for this framework to exist beyond a priori state, this research will examine a workforce's perceptions at different organisational levels of an SME based in Manchester. Thus, an analysis of these perceptions and how they affect tacit knowledge management at the organisation will be carried out. By mapping these different types of tacit knowledge the research aims to further the understanding of definitions in literature and also contribute to the methods of identifying tacit knowledge.

This mapping will be performed by utilising the philosophical notions of Herman Dooyeweerd (1894-1977), particularly the modal aspects, as a guide to analysing different types of tacit knowledge.

1.5 Rationale & Scope

The vast sea of philosophy which attempts to disentangle the roots of knowledge is too broad a scope for any singular dissertation. The study of a form of knowledge however, requires that we explore the underlying structure which leads to its definition. The research examines the roots of how tacit knowledge can be encompassed in knowledge research, but veers away from the defining knowledge itself. However, Dooyweerd's philosophy provides a platform from which the relationship between knowing, knower and knowledge can be illuminated.

The dichotomy of presenting knowledge as tacit and explicit is explored, and the research shows how most of our knowing is tacit in nature, and suggests that explicit knowledge comprises a small part of our knowledge. Tacit knowledge as claimed by many authors such as Nonaka & Takeuchi (1995) is what allows organisations to sustain a competitive advantage; and thus is ultimately more important than explicit knowledge.

In the practical sense, the research covers knowledge creation and shows how the adaptive nature of an organisation must be inclusive of the notion of tacit knowledge, and how current knowledge transfer theories do not account for most elements of tacit knowing. Basden (2008) states "The challenge is always to make tacit knowledge explicit, but without destroying its life-world characteristic." Examining the different types of tacit knowledge makes it plausible to map a way for retaining this tacit knowledge for the organisation. This retention of tacit knowledge thus links together with the notion of organisational learning. It is important to note that tacit knowledge stems from individual learning, however, this does not necessarily lead to organisational learning. (Ikehara, 1999). It falls upon the organisation to integrate individual learning to the organisational learning. The ability to identify the different types of tacit knowledge encompassed at an organisation will primarily aid that

organisation with the ability to harness and retain tacit knowledge accumulated by its employees.

Through the analysis performed on the current literature it is clear that the different definitions of tacit knowledge cannot be integrated. Therefore, the underlying conflict created through literature cannot be resolved. Some authors such as Gourlay (2004) have analysed the different definitions, but have not extended their research to account for the integration of these concepts. Nonaka and Krogh (2009) identified the controversy in tacit knowledge conversion and defended the distinction that needs to be made between tacit and explicit knowledge. However, they did not account for the ambiguity around tacit knowledge in current literature. In addition, others have performed extensive analysis on the variety of views on tacit knowledge such as Hedesstrom & Whitley (2000) and concluded the tacit knowledge in certain fields, for example knowledge management, is completely different to Polanyi's tacit knowledge. In view of this underlying conflict present in literature, this dissertation adds the necessary extensions that will aid authors to explore tacit knowledge more effectively.

1.6 Research Criteria

From its definition, tacit knowledge is knowledge that cannot be explicated. However, by devising an intuition criterion we can be able to discern different types of tacit knowing by delving into explicable areas such as skills, communication and experience. Thus, the research will involve the conducting of qualitative interviews with personnel at different levels of the organisation to gauge their perceptions on differing notions of explicable knowledge. The researcher hopes to strike a balance in terms of diverse perceptions by interviewing both engineering staff and management staff. This is in the hope that a richer

array of data yields better results at the analysis stage. Once the interviews are gathered the research will use aspectual analysis (governed by Dooyeweerd's modal aspect) in the hope that a new way of identifying tacit knowledge will have been achieved.

1.6.1 Introduction to Dooyeweerd & Aspectual Analysis

To introduce the notion of aspectual analysis, we can first ask the question:

“Why is Dooyeweerd suitable to fulfilling the aim of analysing the perceptions of a workforce in order to identify tacit knowledge?”

A brief introduction of Dooyeweerd is thus necessary. Herman Dooyeweerd was a Dutch philosopher who believed that theoretical thought was inadequate to understanding the complexity of the world as it presents itself to us in our everyday experience. Basden (2008) He believed that theoretical attitude towards thinking about the world has always been given greater account over ‘everyday experience’ as a guide to thinking about the world. The main mistake of philosophy, he believed, was the overriding assumption that theoretical thought was autonomous; meaning that it could be used as a base foundation for everything else and is thus seen as the only way to achieve ‘true knowledge’.

From this philosophical thinking, Dooyeweerd suggested that the diversity of everyday experience is brought about by the diversity of meaning; and thus observed that there are fifteen spheres of meaning through which we function. This will be explained further in Chapter 3 while detailing the theoretical framework. Aspectual analysis involves examining the world through these spheres of meaning, which we call **Aspects**. From these aspects we can discern different forms of tacit knowledge, all encompassed under one framework, but contained in different spheres of meaning.

In this thesis, the researcher aims to utilise Dooyeweerd's original views supported by Professor Andrew Basden's interpretation of Dooyeweerd specifically on interpretation of Modal spheres into aspects, and also the illumination of Dooyeweerd's theory of knowing. This is an important distinction to make due to the limited amount of research in utilising Dooyeweerd's philosophy.

1.6.2 Research Domain (Background of Organisation)

The field work was conducted at Axion Recycling Ltd and BettaVeg, two SMEs based in Manchester. Axion Recycling Ltd is a plastic fabrication company and BettaVeg, is a fruit and vegetable wholesale supplier. Axion Recycling Ltd are resource recovery experts based in Salford and Manchester where they house one of the most advanced plastics recycling facilities in Europe. The team is comprised of experienced chemical engineers, polymer specialists, field consultants, researchers and analysts providing a wide array of prospective actors for the research. BettaVeg is a much smaller company employing under 30 employees. The comprise of a sales and marketing team, management staff, drivers and administration staff responsible for day to day running of the company. The diversity in professions provided a rich array of interview data for optimal aspectual analysis.

1.6.3 Research Approach

The research will utilise a qualitative approach due to the depth of understanding and flexibility it allows the researcher when collecting the perceptions of a workforce in interview settings. Denzin & Lincoln (1994) consider qualitative research to be a realistic approach which allows the researcher to address the research questions relating to how experiences in a particular field may be made visible thus creating social construct. Schultz (1993) supports this notion of utilising qualitative research to gain insight by stating that "qualitative research employs meanings in use by societal members to explain how they directly experience everyday life realities."

1.7 Research Aim & Objectives

As stated in chapters 1.3 & 1.4, the aims and objectives derived from the focus, scope and rationale of research can be summarised as:

- i.) Resolve conflict on the nature of tacit knowledge in literature
- ii.) Create a framework for identifying different types of tacit knowledge
- iii.) Show how different forms of tacit knowledge can be explicated

The research hopes to achieve these aims by carrying out the following objectives:

- i.) Background analysis of tacit knowledge definitions, views and philosophical foundations thus identifying conflict in literature
- ii.) Collection of empirical data through qualitative interviews
- iii.) Using Dooyeweerd's modal aspects as the base for the aspectual analysis to be carried out on the interview data

These aims and objectives are designed to fulfil and expound the original research question:

How can Dooyeweerd's philosophy be used to analyse the tacit knowledge held by a variety of people at an SME, thus revealing the different types of tacit knowledge and discerning which types can be explicated?

1.8 Contribution

The framework created will act as a base for resolving conflict in literature. Thus at a rudimentary level, the research contributions to knowledge can be summarised as:

Theoretical Contribution:

- i.) Identifying different types of tacit knowledge and showing how they account for different ideas of tacit knowing in both philosophical and practical literature

Practical Contribution:

- i.) Showing how the new framework can account for individually held and collectively held forms of tacit knowledge as well as those that have both elements.
- ii.) Showing how different forms of tacit knowledge can be explicated

Methodological Contribution:

Showing how within aspectual analysis, how the property of inter-aspectual reaching out can be utilised to illuminate tacit knowledge, and ultimately different fields of research

1.9 Thesis Structure

This thesis is divided into seven sections:

Chapter 1 is an overview of the research into tacit knowledge. It gives a brief introduction into the nature of tacit knowledge and the inception of the idea. It gives reasons why tacit knowledge is an important element when analysing knowledge creation. The chapter raises the issues present in current literature and also identifies the areas of literature that the research will encompass, giving the aims and objectives as well as the rationale and contributions of the research. Finally, this chapter gives a brief introduction to the research strategy and a brief reasoning behind aspectual analysis.

Chapter 2 is the literature review. In this section the different definitions of tacit knowledge in literature are discussed. Additionally, the views on tacit knowledge by protagonists in different fields ranging from business to information systems are critically analysed. Authors presenting views on both the advantages and disadvantages of tacit knowledge are examined; with supporting authors opposing or agreeing with those views are identified. This chapter also introduces the reader to the notion of Dooyeweerd, introducing authors who give reasons as to why his philosophy would be able to encompass the differing notions of tacit knowledge. Finally, this chapter also presents the differing views of tacit knowledge relative to Dooyeweerd's theory of knowing.

Chapter 3 is a discussion of the theoretical framework that will govern the research process. Derivations made from Dooyeweerd's theory of knowing relative to the current literature on tacit knowledge are explored. This shows the importance of Dooyeweerdian thinking when super imposed on the analysis of the contextual and conceptual notions of tacit knowledge.

Chapter 4 covers the research methodology. It gives an overall literature review on the different research paradigms, strategies and data collection tools. This chapter covers how the

theoretical framework will be tested and gives a justification on the methods that were utilised. It also discusses why the normal research patterns could not have provided the desired results. Finally, it discusses the ethical elements that the research faces.

The fifth chapter presents the analysis and findings of the research and a conclusion to the research. It examines the interview data collected and uses aspectual analysis to draw findings from the data. It also presents a discussion of the results gathered and whether the desired outcomes have been achieved. In addition, this chapter summarises the contributions made by the research in relation to the findings. This chapter shows whether the aims of the research were achieved relative to the initial research question and the implications it may have on future research performed on tacit knowledge.

The sixth chapter presents the findings of the research and a discussion of the implications relative to the problems the thesis is attempting to resolve. It shows the disparities between the theoretical framework and what the data analysis of the empirical study are; and whether the researcher needs to alter the framework. Within the limitations of the forms of tacit knowing studied, it shows how the problems in literature can be addressed from the data gathered and the possible extensions for higher quality of findings.

The seventh chapter of the research presents the contributions and conclusions of the research. It shows how the research objectives were met and how the researcher answered the main research questions of the dissertation. This section extensively covers the limitations of the research and argues the stance of the validity and quality of the research. This section also covers a number of future research suggestions, showing how new and exciting paths for that research into tacit knowledge could unfold. It finally concludes the chapter by asserting whether a new framework for defining, identifying and explicating tacit knowledge has been created.

Chapter 2: Literature Review

2.1 Introduction

As Chapter 1 describes, the purpose of this study is to ensure better clarity of tacit knowledge definitions, understanding and its potential for explicability. This second chapter will examine the relevant existing bodies of literature on tacit knowledge and analyse the discourse in greater detail.

This chapter begins by examining the definitions of tacit knowledge as applied in empirical studies. The definitions stem from how those studies approach tacit knowledge in the context research. Gourlay (2004) advises that by exploring how tacit knowledge is viewed in empirical studies, it may help design a framework towards a better definition. It goes further to explain that at this early stage of the literature review, there should not be a leap towards assigning 'types' of tacit knowledge. This chapter then moves to describe the understanding of tacit knowledge in both philosophical and practical application literature. The foundations for establishing a notion of knowledge that is implicit lies heavily in philosophy and this must be explored to see how the tacit knowledge in practical studies have been established in different ways. A discussion of both the philosophical foundations and practical or empirical interpretations of tacit knowledge is also examined.

Once a conclusion has been reached for this section of the literature review, the research examines how the identification of tacit knowledge has also been explored in both philosophical and empirical/practical studies of knowledge that is implicit. A similar undertaking in thoroughly examining the discourse in both areas of literature is performed and a conclusion reached.

This chapter then moves on to explore the explicability of tacit knowledge and examines both the root of its philosophical capability or lack thereof. Discourse in literature is also examined

and a conclusion suggested. This chapter then examines organisational tacit knowledge explored in a different way as described in the previous parts of the chapter. This then leads to the research also examining areas of tacit knowing not greatly covered and interesting ideas of tacit knowledge that may aid in greater clarity of tacit knowledge. This chapter then examines the possibility for a need of a new foundation of tacit knowledge. This section of the chapter re-examines the different sections of the literature review and how the inter-dependency and conflict in literature seem to hinder the progress in mapping a clear understanding and definitively positive discourse in the concept of tacit knowledge. This section thus concludes the chapter charting a course towards creating a theoretical framework capable of providing a new foundation for understanding tacit knowledge.

2.2 The Nature of Knowledge and framing of Tacit Knowledge

The vast sea of philosophy which attempts to disentangle the roots of knowledge is too broad a scope for any singular dissertation. The study of a form of knowledge however, requires that we explore the underlying structure which leads to its definition. Thus, this section gives a brief overview of the perception of knowledge and in turn tacit knowledge in the wider research fields.

To answer the Socratic question, “What is it to have knowledge?” or “What is knowledge?” much of Western philosophy has followed Plato’s offering that, “knowledge is justified true belief.”. This is widely considered as the basis component for the definition of knowledge (Nonaka & Takeuchi, 1995). However, Gettier (1963) provided a platform that showed that Justified True Belief as offered by Plato did not take into consideration the possibility of a person being justified to believe a proposition that was false in nature. While avoiding the entanglements that the Gettier problems identified, using JTB as the starting point for

epistemological discussions is relevant. Knowing something requires that the thing being known be believed. Thus, in this instance, belief is the basic component of knowledge to which the truth and the justification conditions are set (Scheffler, 1965). Graham (1998) goes further and asserts that to believe something requires one to mentally represent it as true. Thus, belief is a mental state in which a subject holds a proposition to be true (Virtanen, 2010). Vehkavaara (2000) concludes that to represent something mentally as true, “naturally includes an idea that the knowing subject is conscious of that belief.”

Virtanen (2010) citing Steup (2008) proclaims that the content of the belief must correspond the prevailing state of things in reality so that it can be regarded as knowledge and thus it becomes ostensibly clear that a false proposition cannot be known. However, the truth of a thing does not make the belief in “justified true belief”, accordingly knowledge as per definition (Pollock & Cruz, 1999). Vehkavaara (2000) asserts that “the condition of justification presupposes that knowledge can be expressed in a form of propositional sentence(s), because an essential idea behind the condition of justification is that the verification of knowledge should be repeatable, or at least examinable by anyone.”

In light of this argument, another definition of knowledge has been considered by Davenport and Prusak (2000), that knowledge: “is a fluid mix of framed experience, values, contextual information and expert insight that provides a framework for evaluating and incorporating new experiences and information.” The scope of in depth analysis of various epistemological perspectives of knowledge is outside the limits set for this dissertation, but as Alavi & Leidner (2001) summarises, knowledge has been regarded as an object that can be stored, transferred and manipulated; a process that can be applied in practice; a state of mind or the factor of knowing and understanding; an ability to “access information”; a capability to find and use information and a knowledge vis-à-vis data information.”

As Plato's definition is the wider accepted notion, then it is important to show the thread that leads from defining knowledge to determining tacit knowledge.

Following on from Plato's definition of knowledge, Yu (2006) citing Grimen (1991) shows how Plato's philosophy accounted for tacit knowledge without proclaiming it as knowledge.

This can be extrapolated from Plato's dialogue *Laches*, the theme of which is courage. In this dialogue, Socrates claims that "And that which we know we must surely be able to tell"

Laches, who is a distinguished general says: "I fancy that I do not know the nature of courage but, somehow or other, she has slipped away from me and I cannot get hold of her and tell

her nature." According to Socrates' standard now that Laches cannot tell the nature of courage he does not know what it is. Grimen (1991) thus suggests that the idea of tacit

knowledge traces its roots back to Greek philosophy, but that the philosophy did not consider it to be knowledge. The idea that what counts as knowledge must be capable of being

articulated and what cannot be told is not knowledge was further enhanced in modern time.

Johannessen (1990) as cited by Yu (2006) elaborates that from Galileo's famous saying, "The book of Nature is written in mathematical language," to Leibniz's dream of a universal

language, i.e. his *characteristic universalis*, to logical positivists' view of knowledge,

propositionally oriented understanding became more prominent and influential. Johannessen

further claims that within the framework of logical positivism, knowledge and language are

woven together in an indissoluble bond. Thus, the prerequisite that knowledge should have a

linguistic articulation becomes an unconditional demand. As Johannessen (1991) puts it, the

possibility of possessing knowledge that cannot be wholly articulated by linguistic means

emerges, against this background, as completely unintelligible. However, this doctrine of

logical positivism has since been called into question. It has been recognised in various

philosophical arguments that propositional knowledge, which is knowledge that is

expressible by some kind of linguistic means in a propositional form, is not the only type of

language that is scientifically relevant. Johannessen (1991) thus observes that this scenario presented researchers with a legitimate argument that knowledge exists in cases where it is not possible to articulate in full measure by proper linguistic means. This leads us to the originator of the term “tacit knowledge”, Michael Polanyi, who calls this kind of knowledge that cannot be fully articulated.

In the context of knowledge in organisations, Krogh et. al (2000) claim that many researchers have defined various kinds ranging from individual and organisational knowledge, to organisational learning models. These researchers give the example of how knowledge would be perceived by cognitive scientists compared to managers at an organisation. The cognitive scientists will define knowledge as involving cognitive structures that represent a given reality, whereas the manager will presumably perceive that no singular definition of knowledge would encompass all disciplines, professional levels and organisations. “The manager is much more likely to associate knowledge with specific situations and “know-how.” They declare that both the scientists and managers are right, and quote Wittgenstein (1958) epithet that asserts, “knowledge is often in the eye of the beholder, and you give meaning to the concept through the way you use it.”

** This highlights one of the issues that a Dooyeweerdian framework might resolve. Showing that beyond the different definitions of knowledge, tacit knowledge can be viewed within a unifying framework whereby different forms of tacit knowing are not exclusive to certain groups of researchers or fields, but can be experienced by the whole of human kind in aspectually different ways.

2.2.1 Tacit vs Explicit Dichotomy & Michael Polanyi’s Tacit Knowledge

Based on the foundations of positivist epistemology, the majority of knowledge literature develops typologies that distinguish between different types of knowledge (Hislop, 2005).

One of the most common distinctions is that between tacit and explicit knowledge. As Casselman & Samson (2005) note, even with the complexity represented in exploring knowledge, a dichotomy between tacit and explicit knowledge is the dominant view. The most commonly held definition for the two phenomena is that “explicit knowledge is knowledge about facts and tacit knowledge is knowledge that is experientially based.” (Nonaka, 1994 & Grant, 1996). Explicit knowledge can be codified and documented and subsequently communicated, while tacit knowledge is less tangible, typically exists only in the mind of the individual and is not easily communicated. It should be noted that the dichotomy in practical literature was brought to prominence by Nonaka and Takeuchi (1995) theory of knowledge creation as Moordian (2005) notes. Nonaka and Takeuchi (1995) classify “explicit knowledge as one which can be articulated in formal language including grammatical statements, mathematical expressions, specifications and so forth. This language can be transmitted across individuals easily...we shall argue a more important kind of knowledge is tacit knowledge, which is hard to articulate with formal language. It is personal knowledge, embedded in individual experience and involves intangible factors such as personal belief, perspective and the value system.”

Virtanen (2010) notes that this view treats knowledge in a traditional way, namely defining it as justified, true belief (explained in section 2.1). Nonaka & Takeuchi (1995) states that “in our theory of organisational knowledge creation we adopt the traditional definition of knowledge as justified true belief.” Hislop (2005) as cited by Virtanen (2010) notes that the fundamental assumption that this view takes is that explicit knowledge is objective and a discrete entity. As tacit knowledge is seen convertible into explicit knowledge, the most crucial knowledge management process is to identify the sources of significant tacit knowledge and codify that tacit knowledge to explicit (Nonaka & Takeuchi (1995).

Nonaka & Takeuchi are a good example to showcase the dichotomy of tacit and explicit knowledge and how conflict arises when the epistemological foundations of knowledge are traversed. This is because Nonaka and Takeuchi (1995) claim that their model incorporates an extension of Polanyi's tacit and explicit knowledge. Virtanen (2010) insists that Polanyi never said that there existed two types of knowledge ontologically, although a number of authors such as Baumard (1996) and Spender (1996) do support this notion. As discerned by Brown and Duguid (2001), Polanyi's original conception of tacit knowledge was not a separate category of knowledge, rather an integral part of all knowing. Thus a dichotomy, if one was to exist, would be that of two forms of tacit knowledge (McAdam et. al, 2007).

Thus the conflict here is seen as two major proponents of the notion of tacit knowledge differing in their view of the dichotomy of tacit knowledge. As McAdams et. al (2007) notes do we take Nonaka and Takeuchi's (1995) view that separates tacit and explicit knowledge as two types of knowledge or Polanyi (1966) who argues that they are two dimensions of one?

2.2.2 Individual vs Shared Tacit Knowledge

McAdams et al (2007) notes that Choo (1998) distinguished between Polanyi's type of tacit knowledge individuals and a phenomenon that was similar in nature, but a characteristic of groups. Baumard (1999) also emphasised the importance of recognising that knowledge in general can be both an attribute of individuals and of groups or collectives. He concludes that tacit knowledge can also be a property of individuals and groups. Von Krogh & Roos (1995) also distinguishes between individual knowledge and social knowledge, however, they make the distinction that socially held knowledge resides in the relations of the individuals. They make the case that tacit knowledge represents knowledge that is embedded in the individuals and can only be an individual case even when socially functioning. For Nonaka & Takeuchi (1995), tacit knowledge is a form of personal knowledge, but also account for tacit knowledge that is shared between groups. Authors such as Wilson.

2.3 The Importance of Tacit Knowledge in Organisations

Grant (1996) claims that knowledge and, most importantly, tacit knowledge is an organisation's most strategically essential resource. Nonaka (1991) also indicates that tacit knowledge is the most important asset that the organisation has and that it becomes the base from which an organisation can renew and sustain its activities and ultimately its competitive edge. Brown and Duguid (1998) suggest that "an organisation's core competency is more than the explicit knowledge of know-what." It requires "tacit know how" to put "know-what" into practice (McAdam, et al., 2007).

Current literature emphasises the importance of tacit knowing not only as a form of competitive advantage and as strategy (Johannessen, et al., 2001), but also related to organisational learning, innovation (Lam, 2000) and product development (Kreiner, 2002).

Johannessen, et al., 2001 citing Sveiby (1997) claim that tacit knowledge is the practical knowledge used to perform a task and it is also the knowledge that is used as a tool to handle what is being focused on. As a result, tacit knowledge in the organisational context as stated by Johannessen et al, 2001, "is practical, action-oriented, experience based, context-linked and personal, but not subjective or relative. It is objective i.e. it can be tested, checked, investigated empirically meaning that work done using tacit knowledge can be tested for quality, durability and reductions in the cost of production."

Leonard (1998) proclaims that managers can use tacit knowledge to aid convergent thinking by creating guiding visions and concepts for groups involved in innovation. Furthermore, collective tacit knowledge is created through shared experiences such as trips to customer sites and deliberate apprenticeships.

Pathirage et al. (2007) as cited by Venkitachalam & Busch (2012), weighed the importance of tacit knowledge in attaining specific industry benefits. For example, due to the labour intensive nature of the construction industry it is dependent on prior individual knowledge to determine the future business solutions. Additionally, Kamara et al. (2003) argue that construction professionals such as engineers and architects consider “transferring certain types of tacit know-how such as best practices from past projects as complex.” Pathirage et al (2007) and many other studies (Teerajetgul & Chareonngam, 2008; Moungnos & Charoenngam, 2003; Sauer et al. 2001) have all suggested that in a highly competitive industry a “people driven” approach is critical as it typifies how organisations can learn. In this regard, Dolog et al., (2008) argued for a personalisation strategy approach to learning. The framework they developed focused on enabling individual learning networks as a shared space of interconnected knowledge repositories which linked towards tacit knowledge being fostered to usher in organisational learning (Venkitachalam & Busch, 2012).

This section has shown how different organisations perceive their knowledge management in regards to tacit knowledge and how different perspectives of tacit knowledge form their assessments on its importance. It also shows how the push towards a knowledge based society makes the consideration of tacit knowledge to be of greater relevance.

2.4 Definitions and Understandings of Tacit Knowledge in Literature

This chapter will examine the existing bodies of knowledge on the proposed field of tacit knowledge. The importance of tacit knowledge will be explored as well as the different elements that constitute the problems that the research aims to resolve. These problem areas cover:

- i.) Variety of Definitions of Tacit Knowledge.
- ii.) Ability to Identify Tacit Knowledge.
- iii.) Explication of Tacit Knowledge.

After examining these three problem areas a conclusion on the findings will be given in section 2.8.

2.4.1 Overview of differing definitions

There are fundamental differences of opinion on key elements of tacit knowledge constitution such as how it is acquired, its role and whether or not it can be explicated (Gourlay, 2004).

Below is a selection of definitions of tacit knowledge in literature each with a differing meaning but describing different elements of the same concept.

Polanyi (1966) defined tacit knowledge as knowledge that cannot be articulated because it has become internalised in the unconscious mind. Polanyi coined the phrase “we know more than we can tell” from which he conceptualised tacit knowledge.

According to Nonaka and Takeuchi (1995), tacit knowledge is defined as personal knowledge embedded in individual experience; which involves intangible factors such as personal belief and value system (Hedesstrom & Whitley, 2000).

Howell (1996,) as cited by Hedesstrom & Whitley (2000) relates tacit knowledge to the performance of skills and defines tacit knowledge as “non-codified, disembodied know acquired through informal take-up of learned behaviour and procedure.”

Howell (1996) & Nonaka & Takeuchi (1995) definitions are almost similar with Howell (1996) relating tacit knowledge more directly to skills of individuals. Thus, the first two definitions have an inclination to tacit knowledge being an individual aspect.

In contrast, Hutchins (1995) defines tacit knowledge of not being only present in individuals, but rather distributed through a social workforce, who work together on similar activities, thus suggesting that tacit knowledge is enabled by a group rather than the individual (Hutchins, 1995). Von Krogh & Roos (1996) supports the notion that tacit knowledge resides in relationships as well as ways of making decisions that affect the way people interact with each other.

In an organisational context tacit knowledge is viewed as the source of knowledge for innovative ideas in organisations (Nonaka & Takeuchi, 1995). This differs slightly from the views of Baumard (1999) who suggests that tacit knowledge is the source of sustained competitive advantage; while Rebernik & Sirec (2007) describes tacit knowledge as a restrictive force and are also joined in the debate by Johanssen et. al (2001) who describe it as being “manifested in tradition” which impedes innovation.

2.4.1.1 Epitomes of Tacit knowledge

McAdam et al. (2007) citing Horvath et al. (1999) suggests that identifying subtypes of tacit knowledge could be used to optimise or tune approaches of knowledge management. These epitomes of tacit knowledge are artefacts that enable us to articulate the diffuseness of tacit knowing to make it more explicit (Haldin-Herrgard, 2003).

The most frequently used epitomes of tacit knowledge compiled by McAdam et al. (2007) are as follows:

1. **Intuition** (Augier et al., 1999; Leonard and Sensiper, 1998; Sternberg and Horvath, 1999; Durrance, 1998; Giunipero et al., 1999; O'Dell and Grayson, 1998; Saint-Onge, 1996; Cook and Brown, 1999).

2. **Skills** (Polanyi, 1966; Augier et al., 1999; Bennett and Gabriel, 1999; Brockmann and Anthony, 1998; Nonaka and Takeuchi, 1995; Cook and Brown, 1999).

3. **Insight** (Leonard and Sensiper, 1998; Durrance, 1998; Giunipero et al., 1999; Bennett and Gabriel, 1999; Brockmann and Anthony, 1998; Brown and Duguid, 1998).

4. **Know-how** (Giunipero et al., 1999; O'Dell and Grayson, 1998; Nonaka and Takeuchi, 1995; Brown and Duguid, 1998; Cook and Brown, 1999).

5. **Beliefs** (Durrance, 1998; Saint-Onge, 1996, Nonaka and Takeuchi, 1995; Brown and Duguid, 1998).

6. **Mental models** (Leonard and Sensiper, 1998; Durrance, 1998; Nonaka and Takeuchi, 1995; Gore and Gore, 1999).

7. **Practical intelligence** (Giunipero et al., 1999; Somech and Bogler, 1999).

A distinctive feature of epitomes of tacit knowledge in literature is the different levels of abstraction. As McAdam et al. (2007) points out, these different epitomes of tacit knowledge relate to different levels of tacitness based on whether they are perceived as being highly individual or exhibit collective tacit knowing properties. The concepts described above

cannot be conveyed to others, and thus even though abstraction is a defining quality of tacit knowing, abstraction in meaning or description does not aid the process of effectively exploring the notion of tacit knowing.

2.4.2 Michael Polanyi

Michael Polanyi was the pioneer of the concept of tacit knowledge as part of a problematic aimed at the philosophical conception of science and scientific theorising (Mooradian, 2005). Polanyi argued that the philosophy behind scientific practice was inherently flawed since it only considered the formulaic knowledge exchanged in laboratories; as opposed to the skills that are actually required to work in a laboratory (Polanyi, 1966). Thus, his intention was for us to recognise the importance of this embodied knowledge; which he defined as being difficult to discern and express. Through the arguments presented that encompass tacit knowledge, Polanyi was thus able to make his initial argument that science had a subjective side and was not entirely an objective phenomenon (Mooradian, 2005). Polanyi's rendition of tacit knowledge involved expressing the facts that "we know more than we can say and it is exemplified by acts of knowledge in which the persons performing the act successfully cannot fully account for their success" (Polanyi, 1966). Polanyi stated that the integration of subsidiary knowledge (tacit knowledge) and the focal knowledge constitutes tacit knowing; thus implying that through repetition, experience and integration with memory, "skills are transformed into their subsidiary role as an enabler of an expanded knowledge" (Polanyi, 1969).

Most of the authors of tacit knowledge cite Polanyi and this has created a wide debate as to whether the interpretations of Polanyi's views were correct. Wilson (2002) argues that Polanyi's view of tacit knowledge has been misunderstood and that the explication of tacit knowledge is not possible. Others such as Nonaka and Takeuchi (1995) have used Polanyi as a base, and proposed extensions to literature and suggest that the explication of tacit

knowledge is possible. (Wilson's and Nonaka & Takeuchi's views have been analysed further in section 2.4.6 and section 2.4.1 respectively).

2.4.3 Baumard's view

Baumard presents four categories of knowledge and the observable behaviours exhibited by each. These four types are: "observed explicit individual behaviours, observed explicit collective behaviours, observed tacit individual behaviours, and observed tacit collective behaviours" (Baumard, 1999). According to Basden (2008), Baumard emphasises that tacit knowledge in organisations is socially tacit; thus encouraging individuals to release it in a public space. Baumard (1999) gives communities of practice as an example of this public space where knowledge is created through social interaction. Some authors such as Callahan (2005) suggest that these communities of practice can be used to manage tacit knowledge. The issue of explication in relation to Baumard (1999) is only possible through social interaction.

Baumard addresses tacit knowledge in both knowledge management context and organisational context. He indicates that tacit knowledge is important since expertise rests on it and also because it is a major factor in attaining a competitive advantage.

2.4.4 Gascoigne & Thornton

Gascoigne & Thornton (2013) note that tacit knowledge is context-dependent, conceptually structured and practical knowledge. They argue that any logical account of tacit knowledge must respect its status as both tacit and as knowledge. However, if one addresses the notion of it being tacit in terms of its principle of inarticulacy and places the assumption that there are states of subjects that are cognitive but cannot be articulated, then a conundrum is created whereby one is forced to examine if that state should be viewed as knowledge.

They go further and state that the truth of Polanyi's slogan, "we know more than we can tell" should be expounded to include the statement "without the aid of both one's environment and one's skills, whether bodily or not" (Gascoigne & Thornton, 2013).

Turner (2014) indicates that through analytical epistemology of three philosophical constructs of tacit knowledge in the form of Polanyi, Ryle and Heidegger, Gascoigne & Thornton (2013) have concluded that what underpins the connection between Polanyi's tacit knowing to the other two is that Heidegger and Ryle are seen as proposing a regressive argument that prioritises "knowing how" over "knowing that".

2.4.5 Collins

Collins (2001) studied scientists and other groups of skilled professionals with an interest in the role and nature of tacit knowledge. He defines tacit knowledge as "the knowledge or abilities that can be passed between scientists by personal contact but cannot be, or have not been, set out or passed on in formulae, diagrams, verbal descriptions and instructions for action. In earlier writings Collins (1974) acknowledged the role of Polanyi's contribution to the idea of tacit knowledge, but argued that the phenomenon was "immanent in the philosophy of Wittgenstein" from whom he drew more inspiration. Two of the studies explored by Collins (1974) explored the difficulties faced in replicating experiments and being able to match the results or successfully carry out the study by another group of scientists. Collins (1974;2001) as cited by Gourlay (2002) asserts that tacit knowledge was evident where teams could perform the studies, but were not able to transmit that to others because in fact they were unaware of the real reasons for their success. In both instances Gourlay (2002) notes, it turned out that the features of the experimental set-up they regarded as marginal or routine practice, and thus overlooked in the documentation of the results, were paramount to the successful execution of the experiments. This was only discovered when

different groups worked together and gradually learnt what the critical factors were. Collins identified five types of such knowledge:

Concealed knowledge: Tricks of the trade; concealment may be intentional or unintentional (where the concealer is unaware).

Mismatched Saliency: Different groups focusing on different variables of a complex piece of research resulting in mismatched perspectives.

Ostensive knowledge: Words may not be available to convey knowledge that pointing can

Unrecognised knowledge: The successful experimenter may be unaware of critical actions that an observer successfully, but unconsciously imitates.

Uncognised/ Uncognisable knowledge: Our ability to utter meaningful sentences without being able to say how; learning requires apprenticeship (Collins, 2001) as cited by Gourlay (2002).

2.4.5.1 Collins Sapphire Case Study

Collins (2001) explored the notion of tacit knowledge by examining how the quality of sapphire is determined. At the time of his research, he indicates that the Russians had performed measurements on the quality of sapphires 20 years before the same experiments could be carried out in the west. He argues that the failure to transfer tacit knowledge of how to make these measurements had been responsible for some of this delay. While the theory behind the measurement of sapphire quality had been known for some time prior to the early 1990s, no one had succeeded in validating it. A Russian group was the first to do so, but when Western scientists were unable to repeat the experiments the Russian success was discounted. It was not until a Russian team visited the UK, and demonstrated what they had done, were they believed. But it then became clear that the experiment required a great deal

of expertise to get it to work. More interestingly the Russians discovered that they did not fully understand how their set-up worked. It was only after much work with the apparatus did the two teams begin to realise the significance of certain materials (specifically, a suspension thread) and of how they were separated. In discussing this case, Collins refers to several types of tacit knowledge – “mismatched salience” (people looking at the wrong thing); “ostensive knowledge” (knowledge that’s easier to convey by pointing rather than talking) and “unrecognised knowledge”, such as the importance of the suspension materials.

2.4.6 Wilson’s View

T. D. Wilson brings in the notion of ambiguous definitions in tacit knowledge. Specifically in the area of information systems, he states that it is paramount to differentiate between the terms knowledge and information. Furthermore, he argues that the base concept of knowledge management is of trivial importance and that there exists gross misunderstandings of Polanyi’s tacit knowledge. In his analysis of tacit knowledge, Wilson analyses Polanyi’s viewpoint where he claims that the literature is misguided in thinking that we can somehow capture this hidden knowledge. According to his view, tacit knowledge involves the process of comprehension, which in turn means that it is an inexpressible process that further suggests that it cannot be captured. Wilson uses Polanyi’s phrase that “we know more than we can tell” to further reinforce his notion that tacit knowledge capture is not possible (Wilson, 2002).

In the case of Nonaka and Takeuchi’s work on tacit knowledge, he claims that they misunderstood what Polanyi was attempting to put forward. Wilson points to the fact that (Nonaka & Takeuchi, 1995) state that “mental models, such as schemata...and viewpoints help individuals to perceive and define their world.” From this statement, Wilson concludes that if such models can be expressed by a person, then they cannot constitute tacit knowledge; conveying that they conform to expressible knowledge, which when divulged becomes

information. “This previously unexpressed but expressible knowledge but expressible knowledge may be termed implicit knowledge” (Wilson, 2002).

Ultimately, Wilson suggests that there is an inescapable conclusion that the idea of knowledge management is a management fad, promulgated mainly by certain consultancy companies and has inevitably failed to help organisations.

However, others such as Hall (2003) have effectively rationalised that the primary issue is that technology has evolved so rapidly that effective management on how to better utilise it has not been sustained. This further emphasises the need for a solid base that enables us to identify the different types of tacit knowledge.

2.4.7 Rebernik & Sirec’s View

Miroslav Rebernik and Karin Sirec from the University of Maribor, Slovenia, investigated the problems of managing tacit knowledge and the importance of unlearning it. They argue that time is a scarce resource in today’s business world, and that the internalisation of new knowledge is a process that occurs over time. In effect, “there seems to be a change from functional organising and functional management, to process organising and process management” (Hammer & Champy, 1993).

Rebernik & Sirec (2007) argues that limited efficiency or productivity of knowledge management efforts has come about because of focus on storing and capturing information through electronic means. Consequently, the distance created between people becomes a hindering factor. This is because **social interaction** is seen as paramount for the diffusion of tacit knowledge. In turn, they list globalisation, diversification and virtualisation of business as limits for face to face interaction, and thus become obstacles to the diffusion of tacit knowledge.

Rebernik & Sirec (2007) claims that advocates of experimental knowledge may be worst at unlearning, since the accumulation of such knowledge required a considerable amount of time and resources. The authors point to Knowles & Saxberg (1988) who suggest that people who are invested heavily in their current knowledge may not be willing to adapt and/or unlearn. In addition, the authors state that the main setback of studying tacit knowledge is that it is difficult to measure or observe. Thus, they have developed a theoretical framework which proposes a methodology of how tacit knowledge can be managed. This includes:

- Recognising that tacit knowledge has both individual and organisational dimensions.
- Analysing the behaviour of individuals and teams on the basis of tacit knowledge.
- Attempting to make the behaviour explicit through sharing it.
- Learning new knowledge and at the same time unlearning obsolete knowledge.

By adopting this management criterion an organisation is able to stimulate innovation so as to gain and retain a sustained competitive advantage. Therefore, in order to maximise the effectiveness of tacit knowledge, an organisation has to separate the management of sharing and learning/unlearning tacit knowledge from explicit knowledge management. Thus, the framework developed by the authors presents a methodology for distinguishing tacit knowledge dimensions.

A number of assumptions have been made by the authors. Firstly, the authors assume that both the individuals and organisations are entities that are unable to unlearn without direction. Secondly, that unlearning cannot be viewed in isolation. Collectively, the main purpose for pioneering unlearning is to allow the inclusion of new knowledge. Therefore, it is paramount to make sure that unlearning is not taken in the context of existing as an end to itself, but as a way of assisting learning and innovation (Becker, 2007).

Additionally, authors such as Hedberg (1981) suggest that new technology does not simply replace old knowledge as the organisation or individual develops, but that knowledge grows and at the same time becomes obsolete as reality changes. Thus, this puts a fundamental question to the approach taken by Rebernik & Sirec (2007) who argue that old knowledge needs to be unlearned in order for new knowledge to be properly utilised.

Alternatively, (Klein, 1989), suggests that old knowledge is not erased, but is maintained for situations where it is acknowledged that the newly acquired knowledge does not apply. Hence, this is in contradiction to Rebernik & Sirec (2007) who have argued that there is a need for the total replacement of the old tacit knowledge for a company to sustain competitive advantage.

Rebernik & Sirec (2007) organisational perspective on tacit knowledge held in both the organisation and that which is held individually. They present a number of conclusive arguments and touch on the notion that not all tacit knowledge can be helpful. It does not matter if one possesses the tacit knowledge if the knowledge itself is wrong; and the difficulty in validating such knowledge drives some authors such as Rebernik & Sirec to suggest that tacit knowledge needs to be unlearned.

2.4.8 Conclusion

This section 2.4 has shown the nature of tacit knowledge in relation to the different definitions in literature and the understandings of what tacit knowledge actually is about. This further illustrates the confusion in literature over what form of tacit knowledge should be considered correct and exacerbates the conflict in literature.

2.5 Explication of Tacit Knowledge

2.5.1 Nonaka & Takeuchi's View

Perhaps the pioneers of accounting for tacit knowledge in knowledge management, Nonaka and Takeuchi distinguished between tacit and explicit knowledge so as to create a dynamic theory of organisational knowledge creation. They used Polanyi's notion of tacit knowledge as the foundation of their framework. Gourlay (2002) indicates that the model works on the notion that knowledge evolves through a rational process of internalisation, externalisation, socialisation and combination.

Nonaka and Takeuchi's model places tacit knowledge as the focal point and suggests that organisations need to implement methods of tacit knowledge capture through effective communication infrastructures. Additionally, they state that tacit knowledge needs to be converted into linguistic numeric form for it to be communicated. Tacit knowledge in this case is separated into two forms; technical and cognitive tacit knowledge. Technical knowledge is defined as knowledge that is created by or through individuals' actions and their personal experiences. Thus, this knowledge can be acquired or transferred through apprenticeship, but does not require the use of language. In contrast, cognitive tacit knowledge is transferred through lingual form involving social interactions (Nonaka & Takeuchi, 1995).

After further examination of Nonaka & Takeuchi's model of knowledge conversion within an organisation, the following deductions can be made:

1. Tacit to tacit: Socialisation: Using this mode the individual acquires tacit knowledge from another person through observation, imitation and practice. They do not use language as the main channel of distribution. Communities of practice, collective or organisational memory

are all phenomena that have been studied as best practice of the circulation of tacit knowledge (Ivona, 2009).

2. Tacit to Explicit: Externalisation: This mode is realised every day in an organisation due to the institutionalisation of tacit rules as internal regulations. Rumours that circulate tacitly can become hard fact. Baumard (2001) as cited by Ivona (2009) claims that the emergence of organisational strategies is a phenomenon of the articulation of collective tacit knowledge into an explicit formulation embracing a plan, actions and tactics.

3. Explicit to explicit: Combination: Individuals exchange and combine their knowledge through mechanisms such as telephone conversations. The combination of existent information can be facilitated by the selection, adding, grading and categorisation of explicit knowledge (Nonaka & Takeuchi, 1995).

4. Explicit to tacit: Internalisation: To understand this mode, the best method used is that of a practical example: Prisoners have the explicit knowledge of the surveillance tower. They recognise the possibility that they are being watched at any given time, but they do not know the exact moment that the guardian is looking or not. The prisoners “internalise” the knowledge and turn it into tacit knowledge. They know tacitly that they may be watched at any given time and they accept the possibility (Baumard, 2001).

From their base assumptions of Polanyi’s interpretation of Gestalts’ indwelling, Nonaka & Takeuchi (1995) indicate that technical tacit knowledge cannot be explicated, however, by extending Polanyi’s tacit dimension they indicate that cognitive tacit knowledge can be explicated through social interaction. However, Gourlay (2002) presents an argument as to how such a big leap in definition, between the two forms of tacit knowledge presented by Nonaka & Takeuchi, was derived. Gourlay (2002) indicates that no such argument has been presented. Some authors such as Wilson (2002) argue that this notion presented by Nonaka

& Takeuchi (1995) is incorrect since it suggests that tacit knowledge can be explicated. However, many authors including Baumard (1999) endorse the notion of separation of cognitive and technical tacit knowledge presented by Nonaka & Takeuchi (1995).

2.5.2 Krogh & Roos' view

Krogh & Roos (1995) as cited by Gourlay (2002) researched knowledge from an organisational epistemological point of view and stated that knowledge resides both in the individual of an organisation and in the relations between people at the social level. The base ethos of their research into knowledge revolved around the notion that there can be no knowledge without the knower. From this stand point, they were able to conceptualise tacit knowledge into their framework indicating a need for the link between knowledge objects and those who are knowledgeable about them. The principle difference between Krogh & Roos (1995) and Nonaka & Takeuchi's view is that tacit knowledge is a characteristic of individuals alone and cannot be explicated; "being embedded into an individuals' action in a specific context" (Gourlay, 2002).

Krogh & Roos (1995) created a model which attempts to bring a clear distinction between individual knowledge and social knowledge, but follows an epistemological point of view regarding knowledge management. Krogh & Roos's (1995) statement "what you see depends on who you are" implied that knowledge is a subjective term (Christensen & Bukh, 2009). According to Kalmanovitch & Skok (2005), the most effective way to bring order to the knowledge management field is to avoid universally acceptable definitions of knowledge. Additionally, since Krogh & Roos approach knowledge management from an epistemological point of view, they in turn suggest that these epistemologies are mutually exclusive. Therefore, this implies that by taking this viewpoint, they are then able to distinguish between different types of knowledge and also identify the limitations to any type

of knowing. Thus, Krogh & Roos claim that since tacit knowledge is a trait wholly for individuals, it cannot be explicated (Gourlay, 2002).

2.5.3 Repertory Grid Technique

This is a special interview technique that Kelly (1991) describes as having been successfully applied to the elicitation of expert knowledge. It allows for the externalisation of personal constructs representing the way individuals think about the world. Fromm (1995) notes that for externalising tacit knowledge, the setup of the repertory grid has to be designed in a way that leads to adequate knowledge. Kelly (1991) developed and refined the method over the years from the 1960's leading to its utilisation in clinical psychology for more than 50 years. The findings from experimental psychology and cognitive science on implicit learning and knowledge, the ideas of dual cognitive systems and the interest in tacit knowledge have given rise to new expectations for the use of the method (Gaines & Shaw, 2003). The repertory grid technique (RGT) identifies perceptions, together with associated feelings and intuitions held about the issue being analysed. Kelly's theory and technique have also been used to explore management and intuitions (Jankowicz & Hisrich, 1987).

2.5.4 Conclusion

This section 2.5 has shown how the differing understandings of the nature of tacit knowledge bring about different views on its explication. The difficulty in managing and ultimately explicating tacit knowledge is of primary interest to organisations and knowledge management frameworks. The discourse in literature does not allow for a singular framework to account for consistency in the application of the notion of exploring tacit knowledge.

2.6 Identifying tacit knowledge (review of tacit knowledge in different fields)

This section explores how different fields of research cover the notion of tacit knowing and why there isn't a singular understanding or definition of tacit knowing; thus the tacit knowledge identified in each of the following cases sometimes differs, agrees or can completely not be overlaid with the others.

2.6.1 Practical Intelligence and Tacit knowledge

Gourlay (2002) reviews a study carried out by psychologists who focused on professional groups, including managers ((Sternberg, 1999; Wagner, 1987, 1991; Wagner & Sternberg 1985, 1986; Sternberg & Horvath 1999).

They acknowledged Polanyi's contribution (Wagner & Sternberg, 1985:438) but did not discuss his ideas in depth. They instead decided to define tacit knowledge as knowledge that is tacit in the dictionary sense of 'tacit' (Wagner & Sternberg, 1985). Tacit knowledge is an attribute of individuals (Sternberg, 1999). It is "practical rather than academic, informal rather than formal" (Wagner & Sternberg, 1986: 54); it is "practical know-how" (Wagner, 1987:1236), or "procedural knowledge" (Sternberg, 1999: 231). It must be acquired in the absence of direct instruction through experience as it is not usually taught (Wagner & Sternberg 1985: 54; Wagner, 1987: 1236; Sternberg, 1999: 233). However, it is not "inaccessible to conscious awareness, unspeakable or unteachable" (Wagner & Sternberg, 1985: 439). The psychologists created a three dimensional model of managerial tacit knowledge (Wagner & Sternberg 1985; Wagner 1987) and developed and tested questionnaires and other research tools to collect and describe it. Through these experiments the psychologists identified a key characteristic that is relevant to the study of tacit knowing. This was the finding that as Gourlay (2002) puts it, "a substantial part of tacit knowledge appears to be relatively general and broadly applicable as opposed to situationally specific"

(Wagner, 1991). While this notion has been established in other research studies, Sternberg (1999) contradicts the finding. He concluded that from a review of other studies as Sternberg & Horvath (1999) notes, that tacit knowledge required for different activities is different and thus it is advisable that it is learned from experiences in an environment where it will subsequently be used (Gourlay, 2002).

The use of practical intelligence criteria has also spawned tacit knowledge studies on military leadership. The tacit knowledge approach to understanding leadership looks at knowledge that is experience based, practically relevant and acquired with little support from the environment (Horvath, 1998). Tacit knowledge studies on military leadership scores correlated with ratings of leadership effectiveness from either peers or superiors and the scores explained variance in leadership effectiveness beyond a test of general verbal ability and a test of tacit knowledge for managers. These results indicate that domain-specific tacit knowledge can explain individual differences in leadership effectiveness and suggest that leadership development initiatives should include efforts to facilitate the acquisition of tacit knowledge (Hedlund et al., 2003).

2.6.2 Tacit knowledge and Artificial Intelligence

Gourlay (2002) noted that in the 1980s and 1990s the question of being able to reduce all knowledge to explicit form was extensively discussed in the context of investigations into the implications of artificial intelligence for work (Goranzon & Josefson 1988; Goranzon & Florin 1990, 1991, 1992). These researchers aimed to provide firm grounding for the concept of tacit knowledge by drawing on Wittgenstein's later philosophy to counteract the criticism of Polanyi's ideas (Janik, 1990). Gourlay (2002) notes that Janik (1988) reviewed several studies in this field focusing mainly on tacit knowledge and argued that the term was used in two ways:

The first way was to refer knowledge that could be made explicit, but which had not yet been rendered so; and the second was to those aspects of the human experience which are wholly knowable, but by their very nature are incapable of precise articulation (Janik, 1988). Thus, Gourlay notes that Janik (1988) identified five types of tacit knowledge that could be placed in the two categories described:

Things not yet put in words: This consisted of: trade secrets, things overlooked e.g. craft knowledge/skill and finally presuppositions.

In this instance, the three types of tacit knowledge remain tacit because no one has bothered to recognise the knowledge or attempted to explicate it. There are no insurmountable hurdles to making this kind of knowledge explicit (Gourlay (2002).

Things inexpressible in words: This consisted of: Knowledge by acquaintance or familiarity. E.g. sounds or smells. The second is “the open textured character of rule following” acquired through practice.

In this instance, tacit knowledge cannot be expressed in words, because following Wittgenstein’s later philosophy, it relates to a sensuous experience or practice (Johannessen, 1992) as cited by Gourlay (2002). A purely sensuous experience is one such as smelling coffee or identifying a musical instrument from the sound it makes. These kinds of knowledge cannot be expressed in words or other explicable forms but must be gained through experiencing the sensations (Janik, 1990).

2.7 Tacit Knowledge Research Context in SMEs

Ngah & Jusoff (2009) state that “Tacit Knowledge exists in every corner of an SME, in its structure and relationships especially in its people.” Tacit knowledge research in organisations is mainly explored through knowledge management and thus knowledge management research itself must be explored in the context of SMEs to fully understand tacit knowledge research in SMEs. The widely accepted proclamation is that knowledge management includes the set of business processes that emphasise technology and people. More than just building a large electronic library, knowledge management is about connecting people so they can think together. Thus, as Alvesson & Karreman (2001) put it, “it is an umbrella term for wide spectrum of academic orientations including information systems, organisational learning as well as strategic management and innovation. “

Durst & Edvardsson (2012) quoting McAdam & Reid (2001) noted that, as with many management practices, knowledge management was invented and developed in large organisations so that they could be applied later to small and medium-sized enterprises.

Jarillo (1989) points out that SMEs face resource constraints and thus the existing resources must consequently be carefully utilised. This is because any wrong decisions made may have catastrophic consequences relative to how it would affect larger businesses (Amelingmeyer, 2005). Since SMEs have efficient and informal communication networks, knowledge sharing is essential especially in an organisation with scarce resources. SMEs usually have a flat structure and an organic free-floating management style that encourages entrepreneurship and innovation. Daft (2007) cited by Durst & Edvardsson (2012) indicate that control tends to be based on the owner’s personal supervision and formal policies tend to be absent in SMEs. One of the evident characteristics of SMEs is that decision-making may be limited to only one person, that is, the owner or manager in most cases (Culkin & Smith, 2000). Consequently, these solitary decision makers are usually responsible for determining

the benefits of knowledge management to support the organisation's operations. This inevitably leads to insufficient time for the management structure to resolve strategic issues. In conjunction with the limited financial resources and expertise, this leads to most of the knowledge being kept in the minds of the owners and some key employees rather than it being explicitly held in physical storage or shared through substitute arrangements. (Bridge et. al, 2003). This has in turn makes knowledge sharing in SMEs had to discern where it may occur in corridor conversations as Wong and Aspinwall (2004) describe or at informal organisation events such as employee birthday parties (Durst & Wilhelm, 2012).

Activities related to knowledge management such as knowledge sharing are time consuming and inevitably require a certain level of trust. Trust presents particular difficulties for SMEs who fear opportunistic behaviour from competitors and thus this lack of trust manifests itself in fear at both a personal and organisational level, and is a strong inhibiting factor for knowledge sharing in SME networks. As Pattinson et. al, (2011) states, "Individuals fear losing their expert status whereas organisations fear disclosure of their competitive advantage."

Slow staff turnover, as found in many SMEs by Durst & Wilhem (2001), may positively contribute to the factors required for better knowledge management such as trust. The issue of heterogeneity when researching SMEs is usually ignored thus revealing the difficulty of comparing SMEs thus making the possibility of a single knowledge management approach almost impossible (Curran & Blackburn, 2001). The primary research in this dissertation focuses on tacit knowledge as revealed in SMEs. Gertler (2003) shows that the three main problems associated with tacit knowledge are: how to produce it, how to find or appropriate it, and how to reproduce and share it. These problems are usually associated with the goal of knowledge management which it to create value by accumulating and leveraging intangible assets.

Cohen & Kaimnekais (2007) assert that the nature of knowledge in SMEs is almost completely tacit in nature. The influential research of Nonaka & Takeuchi (1995) proclaim that the flow from tacit to explicit knowledge is essential for the success of an organisation, but Wong & Radcliffe (2000) differ in stating that this transition is incredibly difficult within SMEs, and thus advises that sharing this tacit knowledge is the preferred way to aid SMEs in improving performance; particularly when tacit knowledge sharing would take place during socialisation and other informal ways where SMEs have efficient and informal communication networks (Egbu et al, 2005) as cited by Ngah & Jusoff (2009).

Therefore in the wake of the knowledge based economy, ensuring tacit knowledge sharing is the best tool for SMEs in enhancing competence and organisational performance which suit its needs and background. The research in this dissertation aims to reveal tacit knowledge in all its forms so that it can be shared, and ultimately explicated to the benefit of the research organisations.

2.8 Literature Review Conclusion

This chapter has covered the importance of tacit knowledge as perceived in literature. This is essential so as to show why tacit knowledge as a concept is essential to organisations. This chapter also covered the problematic areas of the variance in definitions of tacit knowledge as well as the different understandings of what is perceived as tacit knowledge.

This chapter has established that there exists conflict in literature that stems from the deviations in definitions and understandings of tacit knowledge as a phenomenon and itself as knowledge. This conflict in literature presents itself once the application of tacit knowing or examination of tacit knowledge is applied to a practical field. Ranging from how organisational management perceives tacit knowing in its knowledge flow frameworks and how it is accounted for in knowledge management, the inconsistency in what it entails has brought about discourse and confusion to the phenomenon of tacit knowledge. The application of philosophical or analytic epistemological understanding of tacit knowing to scientific fields, has exacerbated the situation further with authors in the practical fields misinterpreting the philosophical underpinnings of knowledge concepts.

Additionally, as we further explore the nature of knowledge in literature, the idea of explication of tacit knowledge presents similar discourse in literature portraying a daunting task on whether it is possible to explicate tacit knowledge, or whether some forms of tacit knowledge are explicable. The techniques that attempt to explicate tacit knowledge in empirical studies in literature are inconsistent and do not seem to be looking at the same element of the phenomenon.

This means that a deeper philosophical understanding of tacit knowledge needs to be undertaken. This will help to bring about greater synergy in the definitions of tacit knowledge in literature. The understandings of tacit knowledge will better focus on similar elements

while exploring the nature of tacit knowledge. There exists no frameworks that can bring about this harmony and thus a gap exists in literature to creating a framework that accounts for the different forms of tacit knowledge while also exploring which forms of tacit knowledge are explicable.

This thesis proposes that a theoretical framework based on Herman Dooyeweerd's modal aspects, is a viable solution to the discourse in literature and its ability to identify which types of tacit knowledge are explicable. This will be better explored in Chapter 3.

Chapter 3. Theoretical Framework

3.1 Introduction

This chapter will cover the framework that has been proposed as a solution to the problems encountered in the literature review in the previous chapter. The framework is based on the philosophical notions of Herman Dooyeweerd and will thus give a greater philosophical understanding of tacit knowledge. In addition, the framework intends to identify different forms of tacit knowledge and account for them, analyse current understandings of tacit knowledge while carefully distinguishing the elements of tacit knowledge they cover. Finally, the framework aims to introduce a method for analysing whether different forms of tacit knowledge are explicable. The aim of this chapter is to present a justified solution to the problems presented in the literature review.

3.2 Background on Dooyeweerd's Philosophy

"There is no one aspect whose kernel meaning is knowing, but rather each aspect provides a distinct way of knowing." Basden (2007).

Herman Dooyeweerd was a Dutch philosopher who attempted to clear away all the things that keep us from seeing the structure of reality; thus allowing us to critically respect the depth of reality as it presents itself to us in everyday life. This allows us to account for differences within reality and also between one thinker and the other (Basden, 2008).

Dooyeweerd believed that 2500 years of theoretical, philosophical and scientific thinking have complicated rather than revealed the structure of reality. He argued that the root of the problem was due to the presuppositions at the heart of Western thinking such as the dividing of form from matter (especially in Greek thought), sacred from secular (medieval) and

control from freedom (modern). Neither philosophical nor scientific thought is ever neutral nor absolutely true; it is seen through the lens of our presuppositions.

3.2.1 Dooyeweerd's Critique of Philosophical Thought

Dooyeweerd (1984) performs a thorough critique of theoretical thought especially as it is found in philosophy. Dooyeweerd was not convinced that theoretical thought, as it has been understood and practised for the past 2500 years, is suited to understanding the complexity of the world as it presents to us in our everyday experience (Basden, 2008).

Dooyeweerd's main aim was to determine what conditions make theoretical thought possible and distinct from an everyday attitude. Through analytical dissection of the history of theoretical attitude, he concluded that it was given undue preference over the everyday attitude.

3.2.2 Dooyeweerd's Exploration of the Ground Motives

Basden (2011) states that, "a ground-motive is a deep presupposition that a thinking society holds about the nature of reality, including rationality, meaning and normativity, and how to think and form ideas and theories of realities. A ground-motive is not a theory about these things, but a deep, widely shared, unquestioned belief and commitment about them, which drives society to develop its thought and philosophies in particular directions."

As Basden (2008) shows, Dooyeweerd discussed the four ground motives that govern philosophical thought:

- i.) The Greek ground motive of Form – Matter.
- ii.) The Judeo-Christian ground motive of Creation-Fall-Redemption (CFR).
- iii.) The Medieval ground motive of Nature-Grace, which arose from a synthesis of the two, and itself gave rise to >>

iv.) The humanist ground motive of Nature-Freedom within which arose the Science Ideal and the Personality Ideal as dialectically opposing poles.

Dooyeweerd worked from the Creation-Fall-Redemption ground motive. This ground motive gives a pluralistic view rather than a dualistic view. Dooyeweerd worked out the philosophical, as opposed to the theological implications of Creation-Fall-Redemption ground motive, in terms of how it allows us to see reality.

Dooyeweerd discovered that it was an important tool that allows us to understand the structure of reality as it presents itself to us in everyday experience (Basden, 2008).

3.3 Introduction to Dooyeweerd's Aspects

Dooyeweerd then delineated fifteen aspects of our everyday life experience which provide a framework for understanding and tackling different issues in life. These aspects cannot be observed in a direct manner, but only applied to differing situations. Below is a table that illustrates the different aspects, the kernel meaning of each and a real world situation:

Figure 1: Aspects of knowing and their Kernel Meanings (Basden, 2008)

Aspect	Kernel Meaning
Quantitative	Amount
Spatial	Extension
Kinematic	Movement
Physical	Energy
Biotic/Organic	Life
Psychic/Sensitive	Feeling
Analytic	Distinction
Formative	Shaping
Lingual	Signification
Social	Respect
Economic	Frugality
Aesthetic	Harmony
Juridical	Due
Ethical	Self-giving
Pistic	Belief

Each of these aspects has a distinct sphere of meaning and law that we all experience. In addition, each aspect is dependent on all other aspects for its full meaning.

Each aspect has an irreducibly different meaning and, indeed, may be understood as a distinct way in which things can be meaningful (a 'sphere of meaning') and good/bad (a 'sphere of law'). This means that aspects are ways of looking at things as well as ways in which things function. Because of this, aspects are not just subjective categories but underlie all human life. Additionally, each aspect is dependent on all other aspects for its full meaning.

There are two kinds of dependency, foundational dependency (reliant on those that came before) and anticipatory dependency (the effect an aspect has on others). Thus, the order of the aspects has to be maintained due to this interdependency.

Additionally, an important notion to consider is the knower-known relationship as assimilated by Dooyeweerd. As Basden (2008) states, Dooyeweerd (1984) stresses that the knower is part of what is known, rather than being independent; therefore the knower is not a detached observer. It is crucial to consider this stand point when assessing the different kinds of knowing suggested by Dooyeweerd.

3.3.1 Characteristics of Aspects

Transcendence of aspects: The aspects work as a framework of meaning-and-law that enables the cosmos, transcends the entire cosmos. Thus means that aspects pertain, across all situations, all cultures, all times, whether we acknowledge or understand them or not.

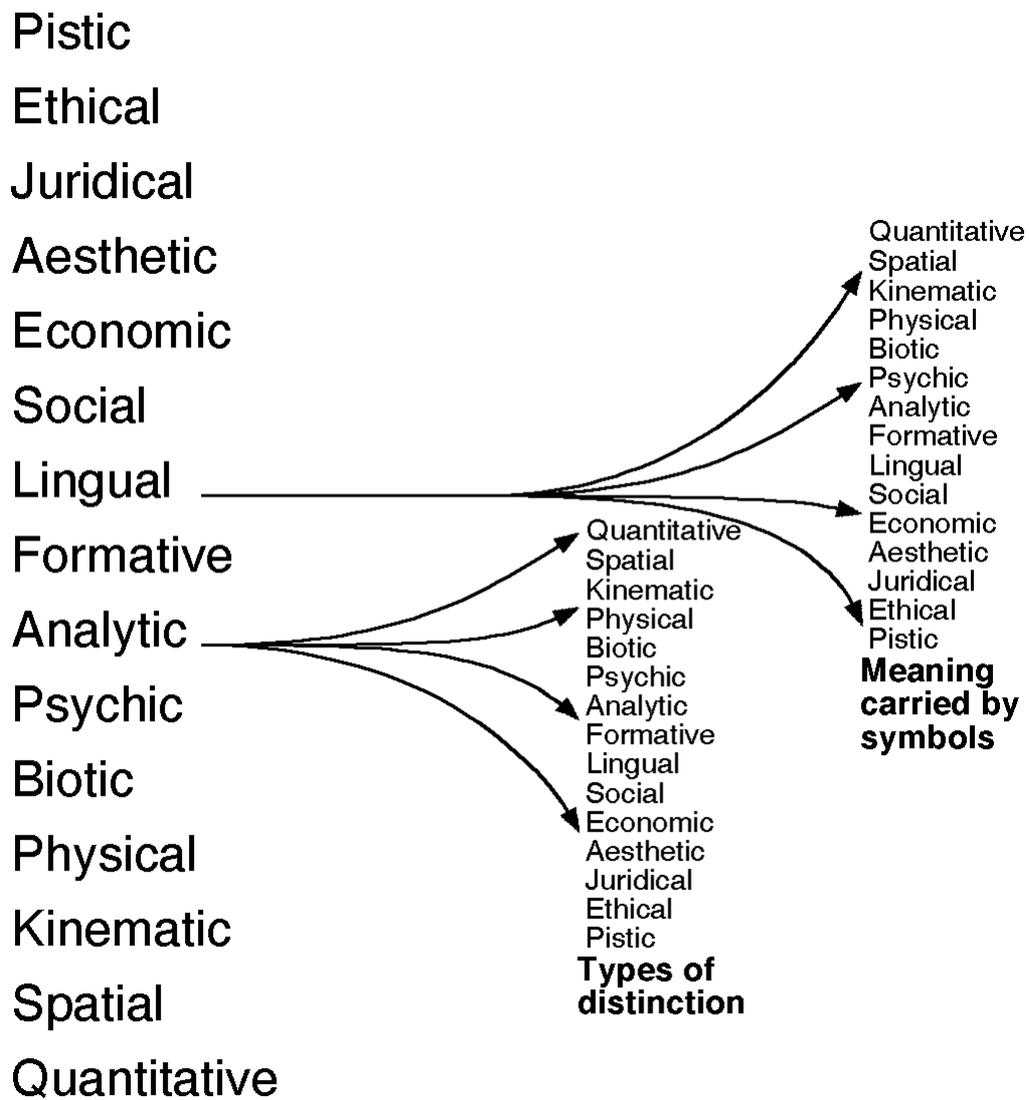
Non-absoluteness of aspects: Though the aspects constitute the enabling framework for the temporal cosmos, no aspect is absolute, in the sense that no aspect can be the foundation for all the others and no aspect has its full meaning within itself. Reductionism absolutizes an aspect. If we absolutize an aspect we treat that aspect as an overriding importance, as the only aspect that should be considered.

Inter-aspect dependency: Each aspect depends on the earlier aspects for its facilitation and on later aspects for the opening of its full meaning (Dooyeweerd, 1984) as referenced by (Basden, 2008). Foundational and anticipatory dependency have been covered in section 3.3.

Inter-aspect “Reaching Out”: There is a third aspect of inter aspect relationship which must be differentiated from both dependency and analogy, where each aspect “reaches out” to the meaning of all others.

The figure below shows how this may work with the lingual and analytic aspects:

Figure 2: Aspects showing Inter-aspect Reaching Out



Basden (2008)

The analytic aspect reaches out in that we make all kinds of distinction between amounts, shapes, feelings and so forth, and the lingual reaches out in that it enables us to speak of all kinds of things. Reaching out is differentiated from dependency and analogy by the following example of lingual-aesthetic relationship:

Dependency (anticipatory): Verse (as in music) is a form of lingual structure and use that is particularly meaningful in the aesthetic aspect, but which would be a mere speculative curiosity without reference to that aspect.

Analogy: The lingual notion, phrase or sentence is used analogically to refer to a short section of music.

Aspectual reaching out (to signify): Words like harmony, beauty, music, art signify aesthetic meaning.

Thus, Basden (2008) concludes that, “Whereas the two directions of inter-aspect dependency differ markedly, aspectual “reaching-out” feels the same whether directed towards earlier or later aspects.”

3.4 Theoretical Framework design

This section introduces the notion of Dooyeweerd’s theory of knowing to show that it accounts for different types of tacit knowledge.

3.4.1 Theory of Knowing

In order for us to distinguish the different kinds of tacit knowledge as defined by the authors, Dooyeweerd’s theory of knowing may be utilised as an inference point. Dooyeweerd indicates that knowing is a multi-aspectual human functioning, thus each of the aspects may be used present a distinct notion of knowing. It is important to point out that Dooyeweerd

does not mention tacit knowledge by name, but from the cumulative understanding of tacit knowledge, his philosophy accounts for the idea of some knowledge being tacit in nature. This is from the notion of the different ways of knowing which he covers and the principle idea that the knower is part of what is known and is not separated from it.

Dooyeweerd's theory of knowing may be utilised to form a separation between tacit knowledge and explicit knowledge. From the base modal aspects, explicit knowledge falls in the categories of the analytic and lingual forms; which in turn leaves all other aspectual forms of knowledge to be tacit. **Analytic knowing** is an ability to make distinctions; whereby one is able to separate themselves from the world. Furthermore, **lingual knowing** is expressed knowledge and is presented in the form of a body of knowledge such as written literature.

3.4.1.1 Relationship of the knower and what is known

One of the major contributions of Dooyeweerd's approach to knowledge and theory is that he puts the knower at the centre of the process of knowing and, thus, the knower is part of what is known rather than a detached observer. As Geertsema (2000) as referenced by Basden (2008) puts it, "knowledge and understanding do not start with the subject as if knowledge has to bridge an original gulf between the two...To do so we have to ignore that in actual life we experience ourselves in coherence with the world around us. There is no original gap that needs to be bridged. Knowledge presupposes that we are in a relationship already."

3.4.1.2 Limits to knowing

As Basden (2008) puts it, "neither science nor philosophy are neutral, but both are strongly influenced by world views and religious presuppositions". Thus, he asserts that neither of them should be treated with the avenue of absolute truth.

Dooyeweerd states that even in the ideal, "There is no truth in itself" (Dooyeweerd, 1984).

Whereas subjectivism questions this notion of truth, Dooyeweerd questions "in itself" that is,

self-dependent and able to stand as truth without reference to anything else. It is not that there is no truth, but there is no truth in “itself”, because all meaning refers beyond itself to its Origin (Basden, 2008). “Hypostatized truth is a lie...there is no self-sufficient partial truth...and so $2 \times 2 = 4$ becomes an untruth if it is absolutized into a truth in itself” Basden (2008) citing (Dooyeweerd, 1984). Therefore, this means that our “insight is fallible”. Non-absoluteness of our knowledge is not an imperfection, but rather a simulation to humility. Tarnas (1991) as cited by Basden (2008) has named Western philosophy’s long believed notion that there is no connection between knowing and known as “secular scepticism”, and thus our capacity to be misled is consequently infinite. Dooyeweerd acknowledged the ability of intuition to grasp cosmic meaning more fully than analytical thinking can.

3.4.2 Types of Tacit Knowledge

To know is to function as subject in the various aspects of knowing, and to be known is to function as object in those same aspects. Below is a table indicating the aspects of knowing, which we note that the first three aspects are missing because knowing implies irreversibility, which enters the meaning-sphere only with the physical aspect:

Figure 3: Aspects of Knowing (Basden, 2008)

Aspect	Ways / aspects of knowing
Physical	Physical knowing is persistent change of physical state resulting from some functioning in the physical aspect. This is the physical 'implementation' of all other types of knowing (e.g. computer memory chips have a persistent electric charge).
Biotic / Organic	The way things have grown, etc. e.g. plant bent towards light 'knows' where the light is. Also the growth of nerve connections.
Psychic / Sensitive	<ul style="list-style-type: none"> a) Memory. Receiving stimuli and holding a memory of them in the nervous system. b) Recognition of a pattern (seen or heard) c) Instinct (of the animal kind).
Analytic	<ul style="list-style-type: none"> a) Making distinctions between things. b) Conceptualizing. c) Making inferences from those distinctions; reflection; what is deducible from what I already know. d) Theorizing.
Formative	<ul style="list-style-type: none"> a) Knowledge of structure; 'knowing my way around'. b) Skills: knowing how to achieve things.
Lingual	<ul style="list-style-type: none"> a) Discourse, debate that sharpens and disseminates. b) Stuff set down in symbolic form, e.g. 'knowledge' stored in books, libraries, records, archives, web sites.
Social	<ul style="list-style-type: none"> a) Buber's 'I-Thou' encounter, but see Ethical aspect. b) Networks of knowledge. c) Shared cultural knowledge, assumptions.
Economic	Managing limits on knowledge (personal and communal memories, etc.). assumptions.
Aesthetic	Harmonizing what we know with what else is known, and with what we experience in life. That what we know 'fits comfortably'. That insight. Example: Habermas' triples all harmonize. How an artist helps us understand reality. and communal memories, etc.).
Juridical	Giving due weight to various pieces of knowledge and to the whole; proportion and a sense of 'perspective', an informed sense of the essence of things.
Ethical	A complete 'entering in' to the other person, in Bergson's sense, is only possible with complete self-giving. Hebrew in Genesis 4:1 the word "he-knew" for 'have intercourse with'. Buber's I-Thou relationship contains at least an element of self-giving.
Pistic	Certainty. Committing to a belief, both the little commitments in everyday living and the large commitments for which we might lay down our lives. Also prejudice etc.

Physical and Biotic Knowing: These two forms of knowing are wholly tacit in nature and cannot be made explicit. Physical knowing relates to persistent change in physical state relating to some functioning in the physical aspect of functioning. Whereas biotic knowing involves the organic or metabolic processing by living organisms.

Psychic Knowing: relates to muscular knowledge, whereby one has a feeling or instinct. A basic example is the act of riding a bicycle. In this type of knowing, there is no separation between the knower and the knowledge. It may simply be described as being “fuzzy knowledge” in nature that one cannot be able to articulate. In the realm of tacit knowledge in organisations, this may relate to the emotional reaction an employee work force feels in relation to a decision made by the organisation.

Formative Knowing: relates to the notion of learning a skill and also the ability of using a particular tool. It may be described as recombined implicit knowledge acquired through experience. An example of this kind of knowledge may be seen when attempting to analyse the procedure of a doctor treating a patient by reading an x-ray. When the x-ray picture is handed to a doctor, he or she is able to immediately assess the situation. This immediate action cannot be explained by the doctor on how they were able to assess the situation so rapidly. Tacit knowledge is implied from the experience and training that the doctor has had. If the similar task is passed on to a relatively new medical trainee they would not be able to treat the patient as rapidly because, although they possess the explicit knowledge on how to treat the patient, they do not possess the tacit knowledge to perform the task as effectively.

Formative knowing must not be confused with formative knowledge, which is best described as explicit knowledge that can be copied, but is not fixed in nature (Takahashi & Vandenbrink, 2004). An example to distinguish would be taking the same scenario of treating the patient; whereby formative knowledge becomes the act of following particular steps and

rules in order to treat the patient and at the same time documenting these steps. Thus, these steps and rules may be followed by a different doctor to treat another patient, however, the steps may be varied or changed to reach the same objective.

Social Knowing: relates to embedded knowledge brought about by cultural connotations of a people who have a shared background. This is a kind of knowledge embedded into the memories of a people who follow a certain way of life and employ particular idioms that would not be familiar to others from different parts of the world. An example of this could be a simple saying such as: “were you born in a barn?” This expression is known to most people in Britain and one would immediately respond by closing the door of a room they just entered. The reaction is immediate even though the origins of the phrase may not be known by a person, the relative meaning of it has been embedded into the conscious memory and thus a response is triggered. People in other cultures would be able to understand what is meant by that phrase (Basden, 2008).

The concept of lifeworld may be used to aid us in defining this type of knowledge. Basden (2008) describes it as pretheoretical or “naïve” experience. Lifeworld may be used to help us understand social knowing since it covers: how we are guided by the content of everyday experience. This content consists of actual beliefs and assumptions people hold as it changes over time and different cultures. The structure of the lifeworld is its nature regardless of the culture and content.

Basden (2008) infers that Husserl (1970) conceptualised the term life-world was so as to differentiate it from the “worlds” of sciences such as physics, psychology, sociology and thus highlight its importance. It was evident to Husserl that for centuries, the “everyday” way of knowing had been thought to be inferior to the theoretical way and thus everyday life was presumed to be undeserving of scrutiny.

In Husserl (1970) magnum opus, he argued that the sciences could not operate without a stock of shared life experiences to give meaning to the concepts used in science. The meaning of concepts depended on the life-world (the world of life). This surmised that science was not purely logical, but also dependent on intuition.

Following Husserl's assertions, it followed that many researchers and thinkers reflected upon the life-world and highlighted more of its characteristics. Some of the elements of these characteristics of Lifeworld oriented frameworks for understanding (LOFFU) throughout history were revealed as follows:

Schultz & Luckmann (1973) proclaimed that "the life-world is above all the province of practice, of action." Basden (2008) notes that this implies that a life-world oriented framework for understanding (LOFFU) should concern itself with practice as well as research. Extending their research Schultz & Luckmann (1989) proclaimed that lifeworld is a pre-given reality with which we must cope. Thus, this resulted that a LOFFU should enable a researcher to listen to the world of their research area as it presents itself to them and not try to force theoretical conceptual structures they bring to it.

Although he did not use the term lifeworld, Heidegger (1962) emphasised that in everyday life we engage with things rather than distance ourselves from them as rational thinkers or actors. The implications for LOFFU in this case dictate that we should not assume that either researchers or practitioners, in their research areas, are "rational actors" who follow a deliberate course of action and rationally deduce, taking a stance above their area, but that they are closely engaged with it (Basden, 2008).

The next characteristic of the lifeworld is that it resists being made explicit. Husserl, Heidegger and others stressed its background nature. Jurgen Habermas further developed the concept of lifeworld in his social theory whereby the lifeworld to him was "the background

environment of competences, practices and attitudes representable in terms of one's cognitive horizon" (Habermas, 1987). Habermas took a critical direction whereby knowledge was based on human interest and was not logical. His social theory is grounded in communication and focuses on the lifeworld as consisting of socially and culturally augmented linguistic meanings. This led to his theory of communicative action (Habermas, 1987) where the rationalisation and colonisation of the lifeworld by the instrumental rationality of bureaucracies and market forces was a primary concern. This emphasised the normativity and meaning we experience in the lifeworld. By contrast systems (for example: organisational, political or economic systems) work by mechanical rules that are supposedly devoid of meaning and normativity. This implies that LOFFU should have a place within it for meaning and normativity as well as structure and process. To summarise Habermas thought that the in the lifeworld things are meaningful and while in the logical things were meaningless.

However, Geertsema (1992) argues that Habermas's view is flawed, that even in the most draconian mechanical system life and work can still have some meaning and normativity. Geertsema as informed by Dooyeweerd, takes note of the life of people within the system whereas Habermas seems to be theorising it. Basden (2008) notes that, "Even the supposed mechanical following of rules only occurs because people tacitly agree do so."

*In a conversation with Professor Basden he noted that even someone whose job is stemmed in performing repetitive tasks, it is up to the person to perform the task in the way that they want. They can perform the task in good faith or not. Thus showing that meaning cannot be reduced to only the social and lingual aspects as Habermas does.

Husserl deals with pre-lingual and post-lingual aspects of knowing; and importantly shared experiences which are encompassed in **social knowing**.

This history of the lifeworld shows how social knowing can be understood in the context of Dooyeweerdian thinking whereby the tacit functioning in social knowing accounts for the shared background environment as described by Husserl (1970).

Economic Knowing: this form of tacit knowledge relates to the notion of assumptions made and how they affect the decisions that we make. As Basden (2008) states, economic knowing lies in managing the limits on knowledge to make it more efficient by improving or removing the barriers of extension to the knowledge.

By analysing this concept further, we find that this type of knowing attempts to bring the element of simplicity to the knowledge. Thus, we are able to attain elegance in the knowledge; and in turn an element of frugality in its delivery.

This type of knowing must be differentiated from the economy of knowledge. Economy of knowledge implies that the knower does not have enough knowledge, which is not the case in economic knowing.

Aesthetic Knowing: (Basden, 2008) states that this type of knowing involves “harmonising what we know with what else is known and with what we experience in life.” It indicates that what we know is positioned adequately in the world; which in turn forms the basis of our insight. An example of this kind of knowledge may be found, as (Basden, 2008) puts it; in how artists help us to further understand reality.

Aesthetic knowing can be easily confused with **aesthetic functioning**; which involves achieving harmony in any tasks that we perform. An example of aesthetic functioning may be shown by a person who is attempting to coordinate different tasks in an organisation. Let’s take a situation where a system is being developed using object oriented programming whereby at the different stages of development each of the object models used, perfectly

synchronise into each other to form a working system. The harmony in the system brings a satisfying feeling to all involved, thus aesthetic functioning is portrayed.

The view of aesthetic functioning in this research is derived from Dooyeweerd's original view. However, the view of aesthetic knowing is derived from Basden's interpretation of Dooyeweerd's theory of knowing. The complexity of inter-dependency expressed by Dooyeweerd (1969; 127-129) created ambiguity in his explanation and thus following Basden's interpretation has allowed the researcher to develop their own view of aesthetic knowing that mirrors Basden's view but does not diminish Dooyeweerd's view.

*During recent conversations with Prof Basden, the researcher noted that Prof Basden was willing to change or evolve his interpretation of the meanings encompassed in each of the modal spheres as he investigated the phenomena in greater detail. This informs the researcher that as more research is performed on Dooyeweerd's philosophy, more people will have differing interpretations of the philosophy, but assimilation towards a general consensus may eventually occur. It is the hope of the researcher that more research will be conducted using Dooyeweerd's philosophy so as to test it further towards greater illumination.

Juridical Knowing: This type of knowledge relates to giving just consideration to different fragments of knowledge and, in turn, a sense of perspective and scope of the knowledge as a whole. It allows us to have an "informed sense of essence of things" (Basden, 2008).

Collectively, this type of knowledge relates to the intuition as to the rightness or wrongness of knowledge. An example of this knowledge can be portrayed in the Kunduz airstrike in Afghanistan. According to (Wikileaks, 2009) the Kunduz airstrike in Afghanistan, which killed ninety people, could have been averted if different pieces of information were given just consideration. According to the pilot bomber who carried out the attack, he said that he had an uneasy feeling about the situation, due to the forceful nature in which ground

command wanted the bombing executed. It was later realised that the commander on the ground with-held certain bits of information from the pilots. However, the sequence of events is not what we should concentrate on, but the actions and feelings of the pilots before they carried out the command. The pilots feeling of unease, as if something was wrong, presents the notion of juridical knowing, that is an intuitive knowledge of the rightness or wrongness of the situation. (The notion of psychic knowing applies here, thus bringing in the concept of foundational dependency explicated in section 3.3).

Juridical knowing must also be differentiated from juridical knowledge; which involves the procedures that enforce laws created by the legislature.

Ethical Knowing: According to Basden (2008), ethical knowing consists of a complete entering in to the knowledge of the other person; which can only be possible with complete self-giving. However, it is unclear what this notion of knowing entails. In my interpretation, (Basden, 2008) is trying to describe notion of giving away of knowledge freely. It is the attitude of willingness to share knowledge. Other aspects may aid in a better definition, such as an underlying juridical knowing that the sharing in the knowledge is a good thing. This is perhaps the most difficult type of tacit knowing to discern and needs further extensions to fully grasp what it entails.

Pistic Knowing: This stems from the certainty of things. It is committing to a belief such as the pledges we set in our everyday lives, or larger commitments that influence our lives as a whole (Basden, 2008).

An example of this kind of knowing may be exhibited by the events leading up to the introduction of the Sony Walkman into the market. The founders of Sony had an unwavering vision for their products and technologies and when the Walkman was first presented to retailers, it had poor sales and reception, most claiming that a cassette player without a

recording mechanism had no future. Akio Morita, one of the founders of Sony, was the driving force behind the continual marketing and support for the Walkman. His faith in the product's future success and certainty that it was going to be successful was the reason why the Walkman came to be (Sony, 2011).

Dependency & Reaching out of the Aspects:

Although the suite of aspects is not a hierarchy where one aspect is more important than any other, the foundational and anticipatory dependency affects the way each aspect behaves in its position. Thus, at a reach, the suite of aspects can be described as a rigid hierarchy. Figure 3 shows the aspects of knowing as opposed to functioning and thus can be described in terms of tacit and explicit knowing. As previously described, within the aspects suite, some aspects are fully tacit in nature and some explicit with tacit elements, and finally some that are tacit, but can be made explicit through some mechanism of human functioning. Through the suite of aspects the following dependencies can be observed:

In the case of analytic knowing, the description given is that analytic knowing involves making distinctions; conceptualising and theorising. In order to do this, analytic knowing must be dependent on psychic knowing which involves memory. That is to say, in order to make distinctions between things (analytic knowing), one must be able to remember the “said things” (psychic knowing). This is a case of foundational dependency.

In the case of formative knowing, which is described as knowledge of structure or skills (knowing how to achieve things, one must be able to make distinctions between different elements of the said structure, so that one can gain insight into how each structure operates. Thus, one cannot have skill of performing a task without being able to make distinctions of where the skill would be useful in order to call it a skill in the first place.

In the case of social knowing, one must be able to understand the laws of language (i.e. communicate) in order to have a share cultural knowledge with other people.

These are just a few cases of dependencies of the aspects and foundational dependency and anticipatory dependency occur throughout the aspects while the rigid hierarchy is maintained.

3.4.3 Ability to Explicate Tacit Knowledge

The above understanding can contribute to the debate on whether tacit knowledge can be explicated. By referring to foundational dependency and human functioning we find that functioning in later aspects, as presented by Dooyeweerd, requires functioning in earlier aspects as well. For instance, functioning in the analytic aspect requires functioning in the psychic as well.

Because of the dependency, tacit knowing in the post-analytic aspect, involves analytic knowing. Analytic knowing is explicit because functioning in the analytic aspect involves making distinctions that become conceptualised. For example, in the development of a skill, first the knower absorbs the explicit knowledge which later turns to tacit knowledge through the experience. Therefore, it is possible in theory to remember some of the explicit knowledge involved in this post-analytic tacit knowing. This suggests that post-analytic tacit knowing can actually be explicated. However, since the functioning in later aspects cannot be reduced into the earlier ones, tacit knowing in post-analytical aspects cannot be fully explicated.

By contrast, pre-analytical functioning never requires analytical dependency and usually operates without it. Therefore, it does not have an explicit component which means that it cannot be explicated. Thus, psychic knowing and biotic knowing cannot be explicated. By applying Dooyeweerd's aspects, the notion of aspectual knowing on tacit knowing might resolve the disagreements that exist in literature on tacit knowledge.

3.5 Using Dooyeweerd's Aspects to Understand Tacit Knowledge in Literature

Before empirically testing the new framework a comprehensive account of how Dooyeweerd's theory of knowing, with particular emphasis on the aspectual knowing, has been undertaken to give a philosophical review of different scientific definitions of tacit knowledge in literature. This is useful as it shows that aspectual knowing can accommodate the different definitions and understandings of tacit knowledge thus eliminating conflict in literature. If the differing definitions and understandings of tacit knowledge are accounted for by Dooyeweerd's theory of knowing in literature, then this gives the theoretical framework a greater mandate to be tested.

3.5.1 Michael Polanyi's view

Polanyi makes several observations when separating tacit and explicit knowledge. He separates different kinds of skills and also defines the genesis of tacit knowledge. He talks about focal awareness/knowledge, which is always present and can be readily illustrated; thus falling into the analytic and lingual forms of knowing. From his literature, he explains through the use of examples such as a doctor treating a patient whereby the doctor can immediately recognise the x-ray picture shown to him and diagnose the patient. This is through experience and training, which in turn recombines with memory; and thus **formative knowing**. He also points out to knowledge which we are not able to explain, and the famous expression "We know more than we can tell". This is indeed **psychic knowing** as with the example he gives of a person recognising the face of a past acquaintance. Although if we were to be more critical of the words used in that phrase, then we would point out that the term "tell" refers to **lingual knowing** and suggest that the phrase is potentially misleading. In his example of driving a nail using a hammer, Polanyi indicates that we are aware in both the

hammer and the nail. (Polanyi, 1962) According to Polanyi, awareness of the nail is focal awareness, which as described above is **formative knowing**, and also awareness of the hammer is subsidiary awareness, through the feelings of our palms and fingers, which is as described above **psychic knowing**. This can be extended further to indicate that there are also other forms of tacit knowing present in the actions of hammering a nail. One further extension is **biotic knowing**, whereby your nervous system is unconsciously conditioned through the actions of hammering a nail or even through muscular strength required to hammer the nail itself.

Summary of Polanyi's view:

Original view of Michael Polanyi viewed primarily as Psychic knowing in most literature. However, the finding in the philosophical analysis determines that his view contains formative knowing, analytic knowing, lingual knowing, as well as the speculation of biotic knowing.

3.5.2 Nonaka and Takeuchi's view

In Nonaka and Takeuchi (1995), a separation of tacit knowledge into two forms presents the foundation on which the SECI model is created. The technical knowing and cognitive knowing described by the authors presents a multi-aspectual notion of tacit knowing. In the case of technical knowing, knowledge is described as being created through an individual's actions and their personal experiences; claiming that it can be transferred through apprenticeships, but cannot be articulated. Since it cannot be articulated, it presents a form of pre-analytical tacit knowing; and in this case technical knowing conforms to **psychic knowing**. However, since it is technical knowing, formative knowing is also a factor in determining the indwelling of a skill (**formative knowing**) as well the distinctions needed to

apply a skill correctly (**analytic knowing**). In the case of cognitive knowledge, knowledge is transferred through social interactions, thus describing **social knowing**.

Summary of Nonaka & Takeuchi's view:

Nonaka & Takeuchi is usually wrongly viewed as an extension of Polanyi's view of tacit knowing accounting for: formative knowing and social knowing

Philosophical analysis finding: In addition to the two forms of tacit knowing identified in Nonaka and Takeuchi's view, psychic knowing and analytic knowing can also be determined from the view although they are never explored. In addition, the social knowing identified by Nonaka & Takeuchi is determined from social interactions, although through the use of inter-aspect reaching out, we can determine that this only describes the social aspect of social knowing, thus ignoring the other forms of social knowing.

3.5.3 Wilson's View

Although critical of tacit knowledge text, Wilson's views point to one discerning conclusion that all others misinterpreted Michael Polanyi and that he was talking about knowledge that cannot be captured; embedded in the consciousness. Wilson's view takes a single stance, that there is only one type of tacit knowledge. Inherently the type of knowledge he describes is combined between the knower and the knowledge. This is undoubtedly **psychic knowing** which he is referring to. Wilson criticises Nonaka & Takeuchi's ability to explicate tacit knowledge. This is due to the mistaken notion that Nonaka & Takeuchi are discussing the same tacit knowing as Polanyi covered in Wilson's interpretation. However, it is clear that Nonaka & Takeuchi are in fact discussing some elements presented by Polanyi's tacit

knowledge. Polanyi's tacit knowing covered a range of tacit knowing forms which are not identified by either Nonaka & Takeuchi (1995) or Wilson (2002).

Summary of Wilson's view:

Philosophical analysis shows that Wilson's view is that Polanyi's tacit knowing only covers psychic knowing. In itself this is incorrect, but in his criticism of Nonaka & Takeuchi's explicable tacit knowing, he is almost right in determining that psychic knowing cannot be explicated from his view point. In this research, it is the determination of the researcher that psychic knowing is partially explicable. However, within Wilson's criticism, other forms of tacit knowledge that are explicable and covered by Nonaka & Takeuchi are not considered. This fosters the web of conflict in literature from the philosophical underpinnings to the practical applications.

3.5.4 Baumard's View

Baumard's tacit knowledge is **socially tacit** since it emphasises knowledge in an organisation. When describing "observed explicit individual" knowledge Baumard describes the individual's behaviour as attempting to verbalise the situation, showing awareness of situation and focusing on problem solving. By unravelling that statement, we can identify the different forms of knowing that Baumard is describing. The individual attempting to 'verbalise the situation' relates to **lingual knowing**, 'showing awareness of situation' and 'focusing on problem solving' indicates **analytic knowing** (making distinctions).

When analysing "observed explicit collective" knowledge, Baumard describes the behaviour the collectives' behaviour as 'deliberately sharing knowledge' and 'striving for collective sense making'. This indicates that Baumard is describing **ethical knowing** and **analytic knowing**; ethical knowing because the persons concerned have a willingness to share knowledge and analytic knowing since they are making distinctions.

When analysing “observed tacit individual” knowledge, Baumard describes the individual’s behavior in terms of ‘having instincts or reflexes’, ‘mixed feelings’ and automatic behaviour’ Baumard is clearly describing **psychic knowing** in this case.

Finally, when analysing “observed tacit collective” knowledge, Baumard describes the collectives’ behaviour as ‘making insinuations’, ‘communities of practice’, ‘collective orientation being sought’. From these terms, Baumard is describing **social knowing** due to the nature of social interaction and dynamics presented in a workgroup.

Thus, in attempting to categorise different forms of knowledge, Baumard has inadvertently covered a significant number of tacit knowing forms. However, according to his interpretation of tacit knowledge, he has only covered psychic knowing and social knowing.

Summary of Baumard’s view:

Tacit knowledge literature wrongly summarises Baumard’s view as only covering psychic knowing and social knowing. However, the philosophical analysis has determined that Baumard also covers lingual knowing, analytic knowing and ethical knowing. These are views of knowing not explicitly explored in Baumard’s view and the diminishing of other forms of knowing to the two forms of psychic knowing and social knowing presents an arena for conflict with other views of tacit knowing that may cover those other types, but seem to be out of step with Baumard’s view.

3.5.5 Von Krogh & Roos’ View

Krogh & Roos (1995) suggests that knowledge resides in both the individual of an organisation; and the relations between people. Although one might suggest that **social knowing** is being mentioned in this context, it is important to state that Krogh & Roos (1995) believe that tacit knowledge resides in individuals alone. Thus, from a Dooyeweerdian

perspective, Krogh & Roos would be contradicting themselves since they unknowingly account for **social tacit knowing** and **psychic knowing**, but disregard the social connotation of tacit knowledge.

Summary of Krogh & Roos view:

Krogh & Roos's view tacit knowledge as only residing in an individual. However, when they bring in relationships between people, other forms of tacit knowing need to be accounted for. In this case social knowing and lingual knowing need to be accounted for as well as psychic knowing which they seem to allude to, but limit its properties.

3.5.6 Rebernik & Sirec's View

Rebernik & Sirec (2007) indicate that social interaction is paramount to the diffusion of tacit knowledge. From a Dooyeweerdian perspective, this suggests that they are referring to the notion of **social tacit knowing**. In their model, created to manage tacit knowledge, they recognise that tacit knowledge has both individual and organisational dimensions. However, Rebernik & Sirec (2007 cites Haldin-Herrgard (2000) for its definition of tacit knowledge; indicating that tacit knowledge entails knowledge that is difficult to express or formalise. Therefore, their notion of tacit knowledge lies in knowledge present in the unconscious which is **psychic knowing**.

Summary of Rebernik & Sirec's view:

Philosophical analysis shows that Rebernik & Sirec's view allude to unlearning psychic & formative tacit knowing. However, they also allude to the notion of social interaction in the diffusion of tacit knowing, thus must also account for social knowing and lingual knowing as well as analytic knowing to make the distinction of which areas need to be unlearned in their definition. Philosophical analysis shows that Ribernik & Sirec's intermation of unlearning

tacit knowledge may present a limited view of how tacit knowing functions as a whole. Multiple forms of tacit knowing need to be evolved in order for unlearning to occur. It is the suggestion of the researcher that unlearning may begin from the formative and social forms of knowing. Social knowing: with the evolution of shared background knowledge of the people interacting; and Formative knowing: In learning new skills.

3.5.7 Reinterpreting the definitions with Dooyeweerd

In the literature review of this dissertation, a number of definitions of tacit knowledge have been presented to indicate the diversity of tacit knowledge definitions. This section uses the framework created from Dooyeweerd's philosophy of modal aspects to reinterpret the definitions of tacit knowledge.

In the first definition, Polanyi defined tacit knowledge with the terms "articulated" and "unconscious mind". The term articulated in this context indicates lingual knowing, thus his definition does not have a lingual knowing element. The term unconscious mind relates to psychic knowing. Thus, we have two forms of tacit knowing being used to describe tacit knowledge. Thus, Polanyi's definition can be simplified as "not lingual knowing, but psychic knowing"

In the second definition, Nonaka & Takeuchi (1995) defined tacit knowledge as personal knowledge and used the terms "embedded in individual experience"; involving intangible factors such as personal "belief" and "value" system. From these terms we can breakdown the definition as describing three forms of tacit knowing. Embedded in individual experience conforms to psychic knowing, persona belief relates to pistic knowing and finally "value" relates to economic knowing.

In the third definition presented by Howell (1996), tacit knowledge relates to "performance of skills". This conforms to the notion of formative knowing. Howell defines tacit knowledge

with the terms “non-codified” which is lingual knowing, disembodied which relates to biotic knowing, “informal” relates to economic knowing (simplicity) and, finally, “procedure” relates to formative knowing.

In the fourth definition, Hutchins (1995) definition uses the terms “distributed through a social workforce”, “work”, and “together” which relate to different forms of tacit knowing. “Distributed through a social workforce” describes tacit knowing defined through social interaction of a workforce. This is social tacit knowing. The term “work” defines applying a skill, which conforms to formative knowing and, finally, the term together refers to the notion of ethical knowing since people are immersed into each other’s knowledge.

In the fifth definition by Nonaka & Takeuchi (1995), the terms “organisational context” and “innovative ideas” are used to describe tacit knowledge. The term organisational context adheres to social knowing, while the term innovative ideas relates to formative knowing.

In Baumard (1999) definition, the term “sustained competitive advantage” is used in the denotation of tacit knowledge. This term refers to economic knowings; since it involves removing sustained barriers to the extension of knowledge, which results in sustained competitive advantage.

In Rebernik & Sirec (2007), tacit knowledge is described as a “restrictive force”. Restrictive force relates to the notion of juridical knowing. Johannessen et. al (2001) as cited by Rebernik & Sirec (2007), uses the term “manifested in tradition” which relates to the notion of pistic knowing. (Tradition in this case may be describing the beliefs or goals that a firm adheres to).

3.5.8 Explication of Tacit Knowledge by Dooyeweerdian Framework

As indicated in section 3.4.3, the explication of tacit knowledge depends on whether the tacit knowledge functions in the pre-analytic or the post analytic. In pre-analytic functioning, tacit knowledge cannot be explicated, while post-analytic tacit knowledge can be explicated, but only partially due to its foundational dependency on pre-analytic forms of tacit knowledge.

In the case of pre-analytic functioning, Polanyi (1966) presents a suitable example, whose notion implies that tacit knowledge is knowledge that is internalised in the unconscious mind and cannot be articulated. Thus, from Polanyi's description of tacit knowledge we can determine that he is discussing psychic knowing, which is pre-analytic and, therefore, cannot be explicated.

In the case of post analytic functioning, Nonaka & Takeuchi (1995) present a suitable example, whose notion of separation of tacit knowledge into cognitive and technical allows them to account for explication. In technical knowing, Nonaka & Takeuchi (1995) are describing the notion of formative knowing since it is recombined knowledge acquired through experience. This formative knowing can thus be explicated, but only partially because of its dependency on psychic knowing which accounts for Polanyi's tacit knowing. This is the philosophical base from which Nonaka & Takeuchi base their frameworks. From Polanyi's definition of tacit knowledge, we recognise that he is discussing psychic knowing, which cannot be explicated. (However, as mentioned in section 3.4.2, we find that Polanyi was describing multiple forms of tacit knowing from a Dooyeweerdian perspective).

In the case of Krogh & Roos, the explication of tacit knowledge is not possible because their description of tacit knowledge indicates that psychic knowing is their primary focus.

However, we have identified in section 3.4.5 that Krogh & Roos inadvertently describe social tacit knowledge, which can then be explicated.

In the case of Wilson (2002), his notion of tacit knowledge is derived from an understanding that Polanyi described only one form of tacit knowing, which was psychic knowing. Thus, Wilson (2002) believes that explication of tacit knowledge is not possible. From that perspective Wilson (2002) is correct, however, we have identified in this dissertation that Michael Polanyi described more than one form of tacit knowledge; most of which can be partially explicated.

It is important to note that the relative nature of explication of tacit knowing, functioning in the post-analytic, is not always static and can, therefore, present situations which prevent post-analytic tacit knowing from being explicated. However, this notion falls outside the scope of this dissertation.

3.6 Initial Theoretical Framework

In this section, the researcher will summarise the properties of the theoretical framework that has been developed in this chapter.

Two major areas of Dooyeweerd's philosophy utilised are:

- i.) The Modal Law-Spheres & their properties: Indicated as aspects (Basden's term).
- ii.) The Theory of Knowing

i.) Modal Spheres (Aspects):

Within the Modal Law-Spheres (the aspects), properties of the aspects are used to determine aspectual functioning in the everyday experience. This covers the full spectrum of the aspectual suite.

This includes: Quantitative, Spatial, Kinematic, Physical, Biotic, Psychic, Formative, Analytic, Lingual, Social, Economic, Aesthetic, Juridical, Ethical, Pistic.

The arrangement of these aspects is shown in figure 1 of this dissertation in the rigid hierarchy that begins from the substratum sphere: Quantitative aspect, to the superstratum sphere; Pistic

Within these aspects, anticipatory and foundational dependencies are accounted for between the different aspects.

The property of inter-aspect reaching out is also applied in this framework; whereby one aspect reaches out to another, beyond dependency as shown in figure 2.

ii.) Theory of knowing

Within the theory of knowing, Basden's interpretation of the theory of knowing is used in conjunction with the researcher's interpretation of Dooyeweerd.

From this, we can be able to delineate knowing itself as opposed to limiting what can be known. The first three aspects of functioning shown in figure 1: Quantitative, Spatial and Kinematic are not included, because knowing implies irreversibility which enters the meaning-scheme only with the physical aspect.

Thus figure 3 of this dissertation shows how we can show the different forms of knowing from the physical form of knowing to the pistic form of knowing.

In addition the structure of the knower, what is known and the process of knowing are included in the framework so as to aid the researcher in the investigation of tacit knowledge at all stages of the research. Dooyeweerd puts the knower at the centre of the process of knowing and thus the knower is part of what is known rather than a detached observer. This characteristic aids the researcher to know that during the interview process, both the interviewer and interviewee are part of what is known and not detached observers of what is being investigated.

From this, an intuition criteria can be created based on the aspects themselves as a critical aspect of the research.

Using these different elements, aspectual analysis can be carried out on the data in order to provide a platform for illuminating the properties of tacit knowledge.

3.7 Conclusion

This section began by introducing the notion of Dooyeweerdian thought to the reader. It showed how Dooyeweerd's philosophy of modal aspects was used to formulate a theoretical framework for understanding tacit knowledge. The different forms of tacit knowing established by the framework were then tested in literature through a philosophical review of existing definitions and understandings of tacit knowledge. This shows the framework as being able to illuminate the different forms of tacit knowing represented in the different definitions and understandings of tacit knowledge at a literary level.

The nature of tacit knowledge, in relation to explication, was also examined and the framework resolved the conflict in literature by defining the parameters of explication within Dooyeweerdian thought. A clear distinction has been made between authors who describe tacit knowing, that functions in the pre-analytic, and authors whose notion of tacit knowing falls in the post analytic thus determining explication.

Dooyeweerd's philosophy brings a common understanding of tacit knowledge, and thus all the different views are integrated as part of a wider picture. Having tested the framework on current literature, and examined the successful results of integration of differing notions of tacit knowledge and its explication, the researcher feels justified to proceed with the empirical testing of the framework.

Chapter 4. Research Methodology

4.1 Introduction

We need a research methodology by which we can apply the Dooyeweerdian notion of tacit knowledge to particular cases. This section acts as the test phase for the theoretical framework adopted for this research in the previous chapter. However, different elements of research methods must be examined in order to determine the nature of the research. The research parameters will then be set accordingly. Silverman (1998) refers to a methodology as a general approach to analysing research topics in order to answer the research questions. A methodology can also be defined as a set of guidelines consisting of various techniques and methods which help to propagate valid and reliable results. Ahrens & Chapman (2006) stress the need for philosophical assumptions to be understood by researchers so as to avoid confusion between the methodology and method. Mingers (2001) defines a method as being a set of activities that comprise of well-defined steps or consequences such as conducting experiments or carrying out ethnography. After making this distinction the first part that the research methodology covers is the philosophical underpinnings of the research. This is covered in the research paradigm.

4.2 Research Paradigm

This section will explore the three main research philosophies used in research and present their underlying ontological, epistemological and axiological assumptions so as to justify why the researcher has chosen the applied paradigm.

Myers (1997) states that, “The most pertinent philosophical assumptions are those which relate to the underlying epistemology which guides the research.” Hirschhiem (1992) refers to epistemology as the assumptions made about knowledge and how it can be gained.

Orlikowski & Baroudi (1991) assert that based on the underlying research epistemology, research paradigms fall under three categories: Positivist, Interpretive and Critical. **Positivist research** assumes that reality is objectively given and can be accounted for by quantifiable or measurable variables (Myers, 1997). It also asserts that developments must be isolated and that the observations can be repeated.

In the case of **interpretive research**, only through subjective interpretation of reality can observations be carried out (Davison, 1998). It further states that observers "...cannot avoid affecting the phenomena which they examine" (Myers, 1997). Thus, interpretivists must then declare that there are multiple versions/comprehensions to a singular event, which then becomes part of the results that they were trying to obtain.

Critical research "assumes that the social reality is historically constituted and that it is produced and reproduced by people." (Myers, 1997) This kind of research critiques the status quo through the exposition of inconsistencies in societal systems. Thus, it results in the separation of the disputed ideals from the norm which in turn resolves the underlying conflicts (Orlikowski & Baroudi, 1991).

4.2.1 Postivist Research Philosophy

Assumptions underlying positivist research are examined in three categories:

i.) Beliefs about Physical and Social Reality: Positivist researchers assume an objective physical and social world that exists independent of human beings and whose nature can be relatively apprehended, characterized and measured without difficulty (Chua, 1986). The role of the researcher is to discover the objective physical and social reality by creating a set of rules that will enable them to detect and gauge the dimensions of reality that the researcher is interested in exploring. Illumination of the phenomena is the primary goal and thus the researcher needs to create a set of constructs, aided by a set of instruments, to capture the

essence of the phenomenon. It is assumed explicitly or implicitly that there is a one-to one correspondence between the elements of the researcher's model and the objects of interest in the domain. The researcher plays a neutral role in conducting the investigation and does not interfere in the phenomenon of interest. Pertinently, a positivist outlook assumes that human action is intentional and bound to rationality. Thus, the assumption about social reality entails human beings to interact in relatively stable and orderly ways and that conflict and contradiction are not endemic in society. With this assumption, conflict is thus seen as a dysfunction of the social system and turns into something that must be suppressed or overcome. (Orlikowski & Baroudi, 1991).

ii.) Beliefs about Knowledge: The epistemological belief of positivist philosophy is concerned with "empirical testability of theories, whether this requires theories to be verified or falsified" (Chua, 1986). Putnam (1983) refers to this stance as hypothetic-deductive account of scientific explanation and states that it has two areas of concern:

The first states that "A search for universal laws or principles from which lower-level hypotheses may be deduced. Positivist researchers work in a deductive manner to discover unilateral, causal relationships, which are the basis of generalised knowledge that can predict patterns of behaviour across situations."

The second concerns a tight coupling among explanation, prediction and control. If a phenomena can only be explained when certain principles and assumptions of occurrence are deduced, then knowing the principles and premises beforehand enables prediction and control of the event or action.

This belief that the empirical world is largely characterised by knowable constant relationships allows positivist research philosophy to endorse a number of research methodologies such as surveys and inferential analysis of primary data.

iii.) Beliefs about the Relationship between Theory and Practice: This relationship is primarily technical. As McCarthy (1978) states, “if the appropriate general laws are known and the relevant initial conditions are manipulable, we can produce a desired state of affairs, natural or social.” Positivists believe that scientific inquiry is value free and as such a desired state of affairs cannot be solved scientifically. As impartial observers, researchers can objectively evaluate but cannot get involved in moral judgements or subjective opinion. Researchers can comment on means, but not ends ” (Orlikowski & Baroudi, 1991). This position is in direct contrast to that adopted by the interpretive and the critical philosophies which argue that the very distinction between fact and value is itself a value judgement. Another aspect of the value-neutral stance adopted by positivist researchers is the belief that they are detached from the phenomena of interest. As interpretive and critical philosophies inherently account for implication in the object of research in practice, it can be said that positivist research ignores the role played by social research in practice. With the arguments for this independence between researcher and phenomenon being studied have been made for natural sciences, the results of social science do enter into the discourse of everyday human reality and clearly can and do transform the nature of these phenomena.

Positivist Research Philosophy: Assessment

The quest for universal laws has led to a disregard for historical and contextual conditions as trigger of events or influences on human action. There needs to be a review of the factors that are intrinsically embedded in social contexts marked by time, locale, politics and culture. Neglecting these influences may reveal an incomplete picture of the phenomena being researched. Positivist research is thus rooted in the status quo due to this disregard of the historical context of the phenomena. The positivist aim to explain and predict external reality

implies that people are not active makers of their physical and social reality. Positivist research techniques encourage deterministic explanations of phenomena, in that these explanations emerge from interactions between the researcher and the participants whereby the researcher dominates the relationship (Orlikowski & Baroudi, 1991). This might take the form of the research participants maintaining minimal interaction with the research participants while carrying out the research (Wilson, 2010). In the search for causal relations the positivist researcher focuses on the validity and control of the research procedures and thus adopts a predefined and circumscribed stance towards the phenomenon being investigated. This is not conducive to the discovery and understanding of non-deterministic and reciprocal relationships. As Rowan (1973) asserts “research can only discover one-sided things if it insists on setting up one-sided relationships...you only get answers to those questions you are asking”.

Due to the nature of the study in this research on tacit knowledge, the researcher has to maintain more interaction with the participants, allow for subjective views of the participants data and thus eliminating the positivist framework as a guide to the research.

4.2.2 Interpretive Research Philosophy

Interpretivism asserts that reality as well as knowledge thereof are social products and hence incapable of being understood independent of social actors that construct and make sense of reality. As Burrell & Morgan, (1979) puts it, the world is not conceived of as a fixed constitution of objects, but rather as “an emergent social process –as an extension of human consciousness and subjective experience”.

Assumptions underlying interpretivist research are examined in three categories:

i.) Beliefs about Physical and Social Reality: Ontologically, the interpretive perspective emphasises the importance of subjective meanings and social-political as well as symbolic action in the processes through which humans construct and reconstruct their reality (Morgan, 1983). Orlikowski & Baroudi (1991) give the example of how this tradition does not presume that organisational structure or social relations are objectively known and unproblematic, but attempts to understand why individuals through their socialisation into, interaction with and participation in, a social world, give it a certain status and meaning. A guiding principle here is that meaning and intentional descriptions are important, not merely because they reveal the subjects' state of mind which can be correlated with external behaviour, but because they are constitutive of those behaviours. Interpretive research assumes that the social world is produced and reinforced by human beings through their action and interaction. The difference here to positivist research philosophy is that whereas positivist researchers are presumed to discover an objective social reality, interpretive researchers believe that social reality can only be interpreted. Orlikowski & Baroudi (1991) expound further that "while interpretive researchers share with the positivist philosophy a belief in relatively orderly interaction, this regularity is not attributed to functional needs of the social system, but to the shared norms and interests that bind humans together." Additionally, interpretive research philosophy does not posit conflict or contradiction as endemic in social systems, however, interpretive researchers recognise that as meanings are formed and transformed, they are also negotiated and thus the interpretations of reality will change over time as circumstances, objectives and constituencies change.

ii.) Beliefs about Knowledge: The interpretive philosophy is premised on the epistemological belief that as Rosen (1991) states, "social process is not captured in hypothetical deductions, covariances and degrees of freedom. Instead, understanding social process involves getting

inside the world of those generating it.” Interpretivist philosophy challenges the assumptions of positivist philosophy that insist on a perspective of disavowal between everyday social practices and the linguistics used to illuminate them. The interpretive position requires that the lingual nature of communication between human beings used to describe social practices constitutes those practices. Putnam (1983) asserts that understanding social reality requires the understanding of how practices and meanings are formed and informed by the language and tacit norms shared by humans striving to achieve some shared goal. The causality of such statements is embedded in the nature of interpretivist frameworks, but they do not share the uni-directional sense or purpose of positivist frameworks. Interpretivist frameworks posit an iterative pattern of interaction in its models of causality with the intention of understanding the actor’s views of the social world and their role within it (Orlikowski & Baroudi, 1991).

The research methods that are appropriate for generating valid interpretive knowledge are field studies, as they explore human beings within their societal settings. Thus, following from the ontological belief that reality is socially constructed, the interpretive researcher is able to avoid imposing their own externally defined categories on a phenomenon. Thus, instead of the researcher approaching the field of study with a pre-defined set of constructs and instruments with which to measure the social reality, the interpretive researcher attempts to derive their constructs from the field by detailed investigation and exposure to the phenomenon being studied. These categories that emerge out of this approach are intended to closely couple those relevant to the research participants. Boland (1979) notes that the underlying premise of the interpretive researcher is that, “individuals act towards things on the basis of the meanings that things have for them, that meanings arise out of social interaction and that meanings are developed and modified through an interpretive process”.

This is one of the major differences between interpretive frameworks and positivist frameworks, that interpretive frameworks are better designed to seek understanding of

meaning of a phenomenon. Rowan (1973) as referenced by Orkilowski and Baroudi (1991) notes that in positivist research “we are talking to processed people” in the sense that they can only answer in terms of our questions and our categories. This is in contrast to interpretive techniques that allow participants to use their own perceptions that are shaped by their own concepts and experiences. Glaser and Straus (1967) asserted that the primary endeavour of interpretive research was to describe, interpret, analyse and understand the social world from the participant’s perspective and any rigid theory of structure, function, purpose and attribution that the researcher imposed would be resisted.

iii.) Beliefs about the Relationship between Theory and Practice: The fundamental rule of the relationship between theory and practice in interpretive research asserts that the researcher can never assume a value neutral stance and is always implicated in the phenomenon being studied. The researcher’s prior assumptions, beliefs, values and interests always intervene to shape their investigations. The level of researcher influence on a phenomenon is widely debated, and this is similar to the debates around the homogeneity of positivist research, with researchers deliberating on issues of verifiability and researcher independence. Two of the more recognisable stances of this debate on researcher implications in interpretive research differ on the role of the researcher in investigating phenomena. Weick (1979) notes that both variants recognise that human actors enact their physical and social reality and that they come to share a set of meaning around this reality. In the first view, named: Weak constructionist view, the researcher attempts to understand the system of meaning shared by the actors through various data collection techniques and thus is able to interpret their action and events in retrospective accounting of the data. Fay (1987) describes this as, “the social scientist is re-evaluating an act or experience by setting it into progressively larger contexts of purpose and intelligibility....and reveals what the agents are doing by seeing what they are up to and how and why they would be up to that.” In the second view, named: Strong constructionist view,

the researchers are not merely presumed to describe phenomenon in the words and categories of the actors, but are presumed to enact the social reality they are studying. Retelling the actors' presents a hurdle and cannot be fully told as the interpretive schemes of the researcher always intervene. Thus, the researcher in part creates the reality they are studying through the constructs used to view the world. This difference between the weak and strong constructionist views has the causal implication of how interpretive research relates to research conducted in the positivist criteria. From the weak constructionism viewpoint, interpretive research is understood to complement positivist research by generating hypotheses for further investigation and by filling the knowledge gaps that positivist research cannot attend to, such as contextual constraints, systems of meaning and the interaction of different parts of a system. On the side of strong constructionism, the view is that no triangulation is possible, for there is no sense in which the interpretive perspective can accommodate positivistic beliefs. Interpretive research is seen to be based on philosophical assumptions which are different from those of the positivist framework. The role of interpretive research then is not to complement positivist investigations, but to replace them. In this bold assertion a researcher cannot select his research perspective based on the nature of the phenomenon, for there is no way he can independently assess that nature without relying on his predispositions. Therefore, in choosing a research approach, the researcher is in fact choosing which aspects of the phenomenon he wishes to focus on. The researcher constructs the form and nature of the phenomenon through the world view he adopts to do the research. The researcher's assumptions and values are deeply embroiled in the phenomenon, even in the very selection of a research approach and, if that is the case, then a researcher cannot really choose an appropriate research method (Orlikowski & Baroudi, 1991).

Example of Positivist research of Tacit Knowledge

Tacit knowledge is viewed as an objective commodity in positivist research, and as thus, for the researchers in this field, explicit knowledge is viewed as the one to have any real value (Linstead 2005). Nonaka & Takeuchi (1995) provide an example of positivist research into tacit knowledge. They maintain that knowledge is a dichotomy of either tacit or explicit, and to create value one must transform tacit knowledge into explicit knowledge. Virtanen (2011) points out that Nonaka & Takeuchi (1995) emphasise the importance of the role of the individuals and tacit knowledge possessed by them in organisation, but are flawed in their dualistic epistemology and the placement of emphasis on the codification of tacit knowledge. Virtanen (2011) surmises that, “Tacit knowledge in this context is seen as a reservoir of secondary knowledge that is useless as such unless converted to real knowledge.”

Interpretive Research Philosophy: Assessment

Interpretive research philosophy reveals the underlying connections among different parts of social reality by examining the social rules and meanings that make social practices possible (Gibbons, 1987). It reminds us that the whole arena of social interaction revolves around shared meanings, interpretations and the production and reproduction of cultural and social realities by humans. It motivates investigations into how humans enact a shared social reality through understanding human behaviour from the point of view and intentions of the human actors themselves. In particular, social process can be usefully studied with an interpretive perspective which is explicitly designed to capture complex, dynamic, social phenomena that are both context and time dependent.

However, there have been some deficiencies of interpretive research and this can be described in four categories:

First: the interpretive perspective does not examine conditions, often external, which give rise to certain meanings and experiences.

Second: Research in this perspective obfuscates the unintended consequences of action, which by definition cannot be expounded by reference to the intentions of the humans concerned. These unintended consequences of action are often a significant force in shaping social reality.

Third: The interpretive perspective does not address structural conflicts within society and organisations and ignores contradictions which may be endemic to social systems. This perspective cannot account for situations where participants' accounts of action and intentions are inconsistent with their actual behaviour and, hence, it cannot analyse the means by which actors may be limited in both their self-understanding and social interactions.

Fourth: The interpretive perspective neglects to explain the historical change through which a particular social order came to be what it is and how it is likely to change over time. Fay (1987) notes that the interpretive perspective, "assumes an inherent continuity in a particular society, that is it systematically ignores the possible structures of conflict within a society, structures which would generate change".

This criteria partially fulfils the target of the study being conducted for this report. This is because interpretive research allows the researcher to gain insight into a problematic. The perceptions of a workforce represent the data required to gain this insight into tacit knowledge. Thus an interpretive framework accounts for part of what this research is targeting.

Example of interpretive research into tacit knowledge

Gouraly (2004) cites the studies performed by Collins (1974) study which explored the difficulties that scientists faced in replicating experiments successfully carried out by others. According to him, tacit knowledge was evident where teams could perform the experiments, but were unable to transmit that to others because they were unable to transmit to others because they were unaware of the real reasons for their success in the experiments. Collins (1974) study has been reviewed in detail in chapter 2 and 6 of this dissertation and is an example of interpretive research where the researcher aims to gain insight into a phenomena.

4.2.3 Critical Research Philosophy

Critical research philosophy's important distinction is its evaluative dimension. In its difference to positivist and interpretivist research perspectives, the researcher attempts to critically evaluate and transform the social reality under investigation. Where the other two research perspectives are content with explaining the status quo, the critical perspective is concerned with critiquing the existing social systems and revealing any contradictions and conflicts that may exist within their structures. Bernstein (1978) indicates that this type of self-consciousness and understanding of existing social conditions can help to overcome oppressive social relations.

Beliefs about Physical and Social Reality: The main idea within critical philosophy is the belief that social reality is historically constituted and, therefore, human beings, organisations and societies are not confined to existing in particular state (Chua, 1986).Walsham (1993) cites Orlikowski & Baroudi (1991) claim that, "Everything possess an unfulfilled potentiality, and people, by recognising these possibilities, can act to change their material and social circumstances." Despite this belief, the critical perspective recognises that the capacity to enact change is constrained, because humans become alienated from their potential by

prevailing systems of economic, political and cultural authority. In light of this alienation an important objective of critical research is to create awareness and understanding of various forms of social domination so that people can act to eliminate them. Another important notion of critical research philosophy is that of totality, which implies that things can never be treated as isolated elements. A particular element exists only in the context of the totality of relationships of which it is part and the element and the whole are bound by an essential rather than a contingent interdependence. This dialectical relationship between elements and the totality is understood to be shaped by historical and contextual conditions. Social reality is understood to be produced and reproduced by humans, but also as possessing objective properties which tend to dominate human experience. Thus, due to this dialectical understanding of elements and the whole, as well as the belief in human potentiality, the critical research philosophy emphasises the processual development of phenomena. Social relations are not posited as stable and orderly, but as constantly undergoing change. This instability is conceptualised in terms of fundamental contradictions that exist in the social relationships and practices of societies and organisations. The critical philosophy also assumes that the contradictions inherent in the existing social forms lead to inequalities and conflicts from which new social forms will emanate from. These contradictions arise from certain parts within the totality opposing each other and because of the incompatible developments among the parts constituting the totality. Additionally, because contradictory elements “may be masked or concealed by a variety of devices such as role segmentations, ideological formulations, segregation of participants, the role of critical research is to expose these hidden contradictions and thereby attempt to reframe the basic oppositions, potentially enacting a different social order.

Beliefs about Knowledge: The epistemological belief of the critical perspective is that knowledge is grounded in social and historical practices (Chua, 1986). There can be no

theory-independent collection and interpretation of evidence to conclusively prove or disprove a theory. Because of the commitment to processual view of phenomena, critical studies tend to be longitudinal (Benson, 1973). The research methods of choice are long-term historical studies and ethnographic studies of organisational processes and structures. Quantitative data collection and analysis are used, although to a lesser extent. The reliance on historical analysis is compatible with the belief that a phenomenon can only be understood historically through an analysis of what has been, what it is becoming and what it is not (Chua, 1986) as cited by (Orlikowski & Baroudi, 1991). Generalisations stemming from this approach would point to regularities of process rather than cross sectional differences and thus, critical research seems to seek illumination of the forces at work in society as a totality and thus an extension from the micro context to the totality that shapes it (Benson 1973 & Burawoy (1985) as cited by (Orlikowski & Baroudi, 1991). The research outcomes differ from interpretive research on two counts: First: This deals with the role of knowledge in human affairs. Second: deals with the relationship between theory and practice which will be covered in the axiological section of this paradigms review. On the level of knowledge, critical researchers do not aim to only give a recounting or interpretation of how participants perceive, understand and act towards various phenomena. As with interpretive researchers, critical researchers believe that they need to understand the language of the humans they are studying, an understanding that is necessarily, temporarily and spatially bound. However, critical researchers depart from their interpretive colleagues in that they believe interpretation of the social world is not enough. The material conditions of domination need also to be understood and critiqued, and these are typically not accessible by merely asking participants who often are unable to perceive and penetrate the circumstances that shape and constrain them. As Orlikowski and Baroudi (1991) put it, the researchers working in this tradition do

not merely accept the self-understanding of participants, but also critically analyse it through the particular theoretical framework which they adopt to conduct their work.

Beliefs about the Relationship between Theory and Practice: The role of the critical researcher is to bring to consciousness the restrictive conditions of the status quo, thereby initiating change in the social relations and practices and helping to eliminate the bases of alienation and domination. In this light, social research and social theory are understood as social critique. In their research of critical organisational research, Stephy and Grimes (1986) claim that the aim of critical research is to develop an organisation science capable of changing organisational processes while Benson (1983), observes that critical theory must be reflexive, critical and emancipatory, thus transcending alienated theorising. Burawoy (1985) writes that the nature and direction of this transcendence is suggested by the assumptions and theories that guide research: “A theoretical framework also leads us beyond what is, beyond verification, to what could be.” As with these perspectives, researchers adopting the critical perspective differ in their beliefs about the role of the theorist in initiating social change.

Benson (1983) further suggests that the role of the critical researcher is to go beyond mere studying and theorising to actively effect change in the phenomena being studied.

Heydebrand (1983,1985) extends this role further by asserting that critical research must also be reflexive and, therefore, transformative not only of the object of investigation, but also the investigator. Habermas (1974) on the other hand distinguishes between the use of critical theories to initiate a process of self-reflection among human actors and use the actual selection of appropriate political action. This leads to Habermas (1976) as cited by Dieronitou (2014) asserting that, “critical theory is conceptualised as an emancipatory and critical ideology with its basic research instruments being ideology critique and action research.”

While critical researchers are clearly responsible for the initiation process of self-reflection among human actors, Habermas suggest that only participants in the community can carry out

the actual selection of political action. Orkilowski and Baroudi (1991) assert that Habermas seems to be assigning a more analytic role to the researcher, although researchers, in their capacity as participants in organisations and societies, clearly could act to transform their social reality where appropriate. But neither this action, nor self-transformation is seen as an essential component of a critical research agenda.

Critical Research Philosophy: Assessment

The critical research alerts us to the reality of interdependence of parts with the whole and that organisations cannot be studied in isolation of the industry, society and nation within which they operate, which they in part constitute. Critical research also exposes us to the influence of historical, economic, social and political conditions on the nature and development of phenomena. Additionally, critical research illuminates our perspectives on the notion of the constantly changing potential of human beings who need not be confined by their immediate circumstances. The status quo is merely one moment or iteration along an ever evolving and emergent dynamic of social reality (Orlikowski & Baroudi, 1991).

The critical research approach does have some weaknesses and in part these are a function of the assumptions which guide critical researchers. As an example, the socio-economic class is seen as the primary determinant of antagonistic social relations. The narrow, almost exclusive focus on economic factors obscures the importance of other factors such as race and gender that have also led to dominating and repressive social relations. This selective perspective is also emulated in critical researchers' recognition of the inherent contradiction in societal relations. While an advance over positivist and interpretivist models with their bias for functionalist theories, this view may overstate the extent to which contradiction is a function of class societies. Critical researchers are often not critical enough of their own concepts and theoretical models. Furthermore, some authors suggest that critical researchers are not

reflexive, that they do not apply their notions of transcendence to themselves and, therefore, do not accomplish self-transformation (Heydebrand (1983). Another area of critique is that critical research philosophy's form of theory and knowledge is uncertain. As noted by Chua (1986), "Critical theorists do not share common philosophical standards for the evaluation of theories. What is acceptable theory or explanation is still debatable." The ambiguity surrounding the evaluation of critical research seems to present a problem for acceptance by dominant research tradition, given their experience with positivism's relatively unambiguous criteria for what constitutes valid knowledge.

While critical theory is useful in researching the structure that govern tacit knowledge research, it cannot solely be utilised as the framework for this research into tacit knowledge as it does not incorporate interpretive elements that are used to gain insight through the perceptions of a workforce.

Example of Critical Research into Tacit Knowledge:

Probert (2003) performs a critical analysis of the knowledge creation process and uses Nonaka & Takeuchi (1995) as a case to be studied in the critical context. He explores the key motivations behind the discourse of knowledge creation and tries to explore the creation of a critical theory of tacit knowledge dissemination. The research reviews Lyotard (1984) and the performativity principle as a possible route due to the notion that "Lyotard was one of the first to link knowledge production to economic well-being in a systematic way and in some ways the knowledge management literature is a sort-of "joyful" extension of that principle." Probert (2003) then reviews active management of the dynamic knowledge creation process in which he reviews the lack of critical review of frameworks such as Nonaka & Takeuchi (1995) and suggests that Foucault's (1982) analysis of pastoral power; in which the study of the power and knowledge relations intrinsic in the typical contemporary

descriptions of tacit knowledge management in competitive firms. From this we can see how the historical power structures of knowledge management and management of tacit knowledge can be studied under a critical theory.

4.2.4 Dooyeweerd as a Theoretical Research Lens

Chapter three of this dissertation has introduced the reader to Dooyeweerd's philosophy as a way of creating a conceptual framework that suggests ways of solving the problems encountered in the literature review. However, the researcher has not covered how Dooyeweerd's philosophy can stand alone as a research philosophy stating its ontological, epistemological and axiological stance. This section will review Dooyeweerd's philosophy in the same manner as the review of the three paradigms explored in the section before.

4.2.4.1 Ontological Stance

The theory of modal aspects gives Dooyeweerd's approach to how he views subjectivity and objectivity. Dooyeweerd's stance lies on the everyday experience and attempts to move beyond objectivism and relativism. Dooyeweerd's philosophy attempted to overcome the Kantian gulf which attempted to drive apart the notion of thought and a thing, phenomenon and noumenon. Basden (2008) asserts that Western thought has been in the shadow of Kant's insight into how absolutely reliable knowledge of the world is impossible if humanity is part of a determined universe but equally impossible if humanity is free. As a result of this view, the individual is "infinitely lonely and isolated of their attempts to know the world and, in science and elsewhere, is dominated by what Tarnas (1991) calls a secular scepticism" (Basden, 2008). A researcher that functions within this stance tries to overcome this infinite loneliness by the notion of inter-subjectivity; in that there is a shared knowledge of the world which is somehow more "true", or at least legitimate, than our individual interpretations. These attempts or compromises that researchers try to overcome ultimately fail. Dooyeweerd took a different stance to overcoming the Kantian gulf and asserted that it could not be

resolved under the Nature Freedom ground motive because it is a meridian expression of the Nature Freedom Ground Motive itself. “Under the Nature Freedom Ground Motive there is no escape from the driving apart of thought and thing” Basden (2008). Thus, the approach to knowledge in Dooyeweerd’s philosophy uses a different ground motive of Creation-Fall-Redemption. (Refer to Chapter 3.2.2 for Ground Motives and Chapter 4.2.6 which discusses how the different ground motives are applied to the three research paradigms of positivism, interpretivism and Criticism explored in section 4.2.1,4.2.2 & 4.2.3).

4.2.4.2 Epistemological Stance

This research studies a phenomenon immersed in the study of knowledge. It is paramount that the researcher is able to first define what knowledge is in the context of tacit knowledge as understood by Dooyeweerd’s philosophy. This has been covered in Chapter 3 with the introduction of Dooyeweerd’s theory of knowing, but needs a brief overview in order to allow linking between Dooyeweerd’s philosophy and already established norms of research.

Knower-Known Relationship: One of the major contributions of Dooyeweerd’s philosophy on the phenomenon of knowledge is that it puts the human knower at the centre. Dooyeweerd emphasised that the knower is part of what is known, rather than an independent ego taking the role of a detached observer. From this viewpoint, as was mentioned in 4.2.4.1, he did not seek to give a solution to the Kantian gulf but rather acknowledged it to be false from the start. Basden (2008) quoting Geertsema (2000) says of Dooyeweerd’s view:

“Knowledge and understanding do not start with the subject as if knowledge has to bridge an original gulf between the two...To do so we have to ignore that in actual life we experience ourselves in coherence with the world around us. There is no original gap that needs to be bridged. Knowledge presupposes that we are in a relationship already.”

This view is what allows Dooyeweerd's theory of knowing to encompass the complete spectrum of the different forms of tacit knowing suggested in Chapter 3 of this dissertation.

Further epistemological stance of Dooyeweerd is covered in Chapter 3 of this dissertation where knowledge is shown to be a law-subject-object relationship; and thus defined in Dooyeweerd's aspects of knowing. In addition section 4.2.6 of this dissertation covers how we can link Dooyeweerd's epistemology to the three main research paradigms.

4.2.5 Paradigm Chosen

The positivist view into tacit knowledge has been rejected by the researcher because it limits tacit knowledge to being an object commodity that needs converting to explicit knowledge. Examples of positivist research reveal it to take a dichotomous view of knowledge being wholly tacit or wholly explicit. This goes against the Dooyeweerdian framework developed for this research which accounts for tacit knowledge as a process in which different forms of tacit knowledge have differing levels of both tacit and explicit elements in their nature.

In terms of a taking a purely critical view into tacit knowledge, the researcher fears that the exploration of power dynamics in itself as presented within the historical research into knowledge management and tacit knowledge and also how influential philosophies affect what is put in practice in the study of tacit knowledge, presents an important section of this dissertation. However, to fully illuminate tacit knowledge in the context of current literature, the researcher has to perform an interpretive study supported by a socio-critical element.

The philosophy of research depends upon how data is collected and interpreted by the researcher. This research has considered different research paradigms and concluded that it would take a mixed approach of both critical and interpretive research. In terms of holding an interpretivist stance, this is derived from how the research will be conducted in terms of collating primarily subjective perceptions of a work force relative to the questions they face

about the notion of tacit knowledge. Interpretivist research allows the researcher to gain insight into a research area. This falls in line with the basis of interpretivism which emphasises that research should be carried out through subjective interpretations of reality (Davison, 1998). In terms of critical research, Davison (1998) states that “it assumes that the social reality is historically constituted and that it is produced by people.” This is important to consider since every organisation carries its own unique history.

One of the major drivers of critical research is that it actively challenges the interpretations and values of perceptions in order to bring change to the status quo. (Hammersley, 2009) This may be useful in trying to discern how the notion of tacit knowledge is often ignored in both organisational management and knowledge management.

When we examine the positivist research, we find that it does not adhere to the research tradition of the proposed study to be undertaken. It assumes that reality is objectively given and can be accounted for by quantifiable or measurable variables. (Myers, 1997) It also concludes that the observations can be repeated and any augmentation should be isolated. This research will primarily deal with subjective interpretations of tacit knowledge and, thus, falls out of the range of the paramount objectivism in positivist research. We need to not only emphasise the importance of subjective meanings of the research participants, but also the social structures which condition and enable such meanings and are constituted by them Walsham (1993). How tacit knowledge flow occurs in an organisation relies heavily on the constitution of the organisation and its structure. An organisation’s culture will greatly influence how tacit knowledge is held, shared and the possibility of its explication. Beyond this, how tacit knowledge is viewed in literature and the nature of its philosophical constitution brings about discourse, is also a reflection of the research community’s inability to try and find common grounding on the issue. This is why the researcher believes that the qualities of critical research in this instance, and the qualities of interpretive research in

gaining insight, are best suited to be integrated as a singular framework to better aid in bringing clarity to the issue of tacit knowledge.

4.2.6 Justification of Interpretivist & Critical stance

Klein (1999) considers that the integration or union of interpretivist and socio-critical approaches is one of the most crucial elements in research due to their complementary nature. In order to enable this research to implement both approaches of interpretive and critical research, an analysis of how an integration between Kleinian thought on research and how it fits together with Dooyeweerdian philosophy has to be undertaken.

While interpretivist approaches are well established in literature and supported by thorough empirical foundations, socio-critical approaches do not have strong philosophical foundations. To this effect while examining different philosophical ideas as basis for socio-critical and interpretivist integration, Klein (1999) could not find a suitable philosophy as basis to achieving this integration. Klein (2007) showed how different philosophies ranging from phenomenological, socio critical and linguistic were not sound basis for integration. However, he did indicate in Klein (2004) that critical realism had not been examined.

Myers & Klein (2011) suggest principles for socio-critical field studies in research based on the belief that insight, critique and transformation are the essential areas of concentration in socio-critical research processes. Myers & Klein (2011) infer that interpretivist qualities would contribute to insight while normative principles can contribute to the other two essential areas of critique and transformation. While integration is suggested when placed in this scenario, there is no philosophical foundation for it and in its current form, it is prone to failure since the drawbacks of one approach may be imposed on the other and this may render the integration a failure. Basden (2011) suggests that we need to find a “proper philosophical foundation” for understanding how we can integrate successfully interpretivist and socio-

critical approaches. Furthermore, he suggests that Dooyeweerd's philosophy can be used as the basis of integration of interpretivist and socio-critical approaches.

4.2.6.1 Linking Dooyeweerd with the Three Major Research Paradigms

From the basis that this research's theoretical framework has been designed using elements of Dooyeweerdian philosophy, a theoretical suggestion of philosophical analysis targeted at integrating the interpretivist and socio-critical approaches as suggested by Klein (1999) has been explored.

The four ground motives, as described in section 3.2.2 of this report, influence the way in which each research paradigm approaches the world and thus the way the research is conducted. The three main approaches to research are summarised by Basden (2011) as follows in terms of ground motive influence:

In the case of Positivism, a product of response to Kantian philosophy, which in itself was influenced by the Nature-pole ground motive, it presupposes that "the world operates by invariant, causal, largely mechanical laws." The expressions of freedom in both the research and the researched world are both minimised. From the world it seeks quantified facts while from the researcher it seeks thorough objectivity to minimise variability.

In the case of Interpretivism, a product of the dialectical reaction against positivism has its roots in phenomenology and hermeneutics and is thus influenced by the Freedom Pole ground motive. Klein & Myers (1999) states, "that instead of logical rationality it is the harmony between detail and context that is important." Basden (2011) expounds on this and asserts that "the researcher is seen a sense maker who must, because of the Freedom-pole, be autonomous with no constraints allowed".

In the case of the socio-critical approach, the world consists of social structures to be critiqued and transformed. Myers & Klein (2011) as cited by Basden (2011), believe that these structures depends on which socio-critical theories, oppression, power, prevailing beliefs or beliefs of the researcher. Basden (2011) goes further to state that “researchers are seen as emancipators who critique and transform both the status quo and their own fallible beliefs.” Hirschheim et. al (1995) assert that whatever facet gives meaning to motivate critique and transformation is freedom from unwarranted constraints. This governs socio-critical research and originates from the Nature Freedom ground motive. However, Basden (2011) cautions that this notion falls “uneasily astride the two poles because of the norm of freedom itself becomes a constraint and the implied notion of unwarranted constraints has no meaning within this ground motive”.

Basden (2011) notes that as origin of meaning, the Nature-Freedom ground motive offers only its two poles, however, Dooyeweerd offers diverse spheres of meaning based upon the Creation-Fall-Redemption ground motive. These spheres of meaning (aspects) are summarised in section 3.3 of this report. The three research approaches may be reinterpreted to align with the aspects that inspire them.

The following table shows how Basden (2011) links the three approaches of Postivist, Interpretivist and Socio-Critical can be reinterpreted by the aspects:

Main Aspects of Positivist (P), Interpretivist (I) and Socio-critical (C)			
Aspect	World	Rationality	Meaning
Quantitative	P: quantified 'facts'	P: statistical	
Spatial			
Kinematic			
Physical			P: mechanistic causality
Biotic / Organic			
Psychic / Sensitive			
Analytical	I: distinct cases, detail and context	P: logical	
Formative	C: power-relations		
Lingual		C: communicative	
Social	C: social structures		
Economic			
Aesthetic		I: harmonising	
Juridical		C: emancipatory	C: 'wrongness', 'unwarranted' C: emancipation
Ethical		C: Kleinian self-critique	
Pistic	C: assumptions	C: subversion C: apologetics	I: Sense-making: belief, <i>Weltanschauung</i> , meaningfulness

Figure 4 Ground Ideas of Three Approaches to IS Research (Basden, 2011)

We can see how different research approaches if placed on an aspectual table show what each research approach finds most important. We can see that Interpretive (I) finds the analytic aspect most important when viewing the world, but the rationale is stemmed from harmonising the insights of the world and thus is accounted for by the aesthetic aspect.

Each of the research approaches is governed by some of the aspects in terms of what they view as important.

We may attempt integration by blending aspects from each approach, such that no aspect dominates what is viewed as the most important. From this, Basden (2011) asserts that, “the world would be expected to involve interpretations and quantifications, especially of social structures, power relations and assumptions; this finds echoes in Doolin & McLeod’s (2005) critical interpretivism”.

The rationalities employed, as shown in the summary of approaches table, would be from quantitative, analytical, lingual, aesthetic, juridical, ethical and pistic aspects thus dispelling the illusion that a single rationality can be enough. Basden (2011) goes further to show how transcendental questions created from the creation-fall-redemption ground motive may be answered in relation to research approaches. However, by showing how we can be able to blend the rationalities of different approaches by using modal aspects, we have shown that it is possible to successfully integrate interpretive and socio-critical approaches and have a philosophical foundation.

4.2.6.2 Researcher’s rationality

“All rationalities should be employed by the researcher and the research community during written and other discourse” Basden (2011).

Basden (2011) expounds this by saying that while most researchers employ **analytic**, **formative** and **lingual** rationalities to their research, great researchers employ all aspectual rationalities. He points to the Klein & Rowe (2008) paper that discusses professionally qualified doctoral students. He points to how the researchers employ **social** rationality by designing the arguments to show respect to those involved, **ethical** rationality through the self-giving nature of the research at the expense of self and **pragmatic** rationality which hopes to motivate the reader to achieving this. The researcher is from a Computer Science background and most of the research he has thus far encountered has been primarily positivist. However, having been exposed to Dooyeweerdian philosophy, the researcher is committed to applying all aspectual rationalities in the research especially when dealing with elements outside the control of academia such as in the field work. The subjective and objective nature of research can always be accounted for by Dooyeweerd's aspects of meaning which are irreducible and thus are all important.

4.2.6.3 Conclusion

This section 4.2 has covered the different research approaches as described in literature. It has also performed a Dooyeweerdian interpretation of the three main research approaches. In addition, a justification of why the researcher intends to carry out critical interpretive research has been carried out. The researcher has shown how different approaches are governed by rationalities based on what they consider most important from the research. Through Dooyeweerd's aspects, this section has shown how different rationalities can be accommodated in order to integrate different research approaches. This is especially important when trying to integrate the interpretivist and socio critical approaches that this research intends to take. This section has shown how aspects can be used to discern that all rationalities should be considered when performing research as the researcher intends to do.

After choosing the research paradigm to be taken, the researcher must then decide the strategy that will govern the research.

4.3 Research Design

The next stage after choosing a paradigm that is in sync with the research is to pursue an appropriate research design. This acts as a precursor to the research objectives as it lays out a framework for identifying the steps and methods required for data collection and analysis.

After selecting a suitable paradigm, the researcher pursues an appropriate research design.

The research design is a precursor to the research objectives as it aids in providing a base for the steps and methods required for the collection and analysis of data (Burns & Bush, 2002).

Malhotra (2004) points out that research design is a framework for conducting research. It needs to show the steps crucial to obtaining the information or data needed for the research to progress. Saunders (2003) points out that there are three categories of research designs:

Exploratory, Descriptive and Casual research:

Exploratory Research: Malhotra (2004) indicates that the primary objective of exploratory research is to fully examine a situation to provide clarity on the underlying phenomena.

Exploratory research gathers sufficient insight from a wide ranging base in its research community that can be used to illuminate previously researched fields or those that have not received enough attention in the research world.

Descriptive Research: Proctor (2003) states that “the objective of descriptive research is to generate an accurate understanding of behaviours, events or situations.” Additionally, descriptive research is performed to attain different goals such as “characteristics of relevant groups, determining the perceptions or make specific predictions” (Malhotra, 2004).

Causal Research: This research explores the notion of causality in that causal analysis is carried out to distinguish between which variables are the causes and which are the effects in a research situation (Malhotra, 2004). This is a distinction between independent variables (cause) and dependent variables (effect) and their existing dynamics (Proctor, 2003). Causal research seeks to explain the actions and implications when variable elements are introduced to a research area.

This research will take an exploratory framework as there has been no previous research into how tacit knowledge can be identified through from critical interpretive research while using aspectual analysis.

4.3.1 Justification of Chosen Research Design

This research will follow the dynamics of exploratory research design. Due to the nature of the research field this research represents a criteria where new research is being conducted to see if different notions of the same idea, causing discourse in literature, can be accounted for and a solution generated. Dooyeweerd is used as a philosophical foundation for the theoretical framework to enhance greater understanding to the notion of tacit knowledge. Both Dooyeweerd's philosophy and the idea of tacit knowledge are not common in the domain of the research community. In terms of tacit knowledge, there are relatively few extensive empirical studies and this holds true to the testing of Dooyeweerd's philosophy. An exploratory research design will allow the researcher to have flexibility in exploring both areas of study without the constraints that would hinder illumination.

4.4 Research Approach

Three approaches into conducting research have been examined: quantitative, qualitative and mixed method research.

Quantitative research entails taking a statistical approach to research design in the prediction of results based on a set of numerical data. It collects data on pre-determined instruments that yield statistical data, thus findings can be predictive, explanatory and confirming (Williams, 2007). Due to the sample size of this research, quantitative research does not adhere to the scope of this thesis.

Qualitative research is a holistic approach that involves the generation of theory. This approach enables a researcher to obtain a greater level of detail from more involvement in the research itself (Creswell, 1994). Qualitative research builds on the principles of inductive rather than deductive reasoning. Therefore, the arguments/questions raised from the observations, lay the foundations for analysis by the researcher. The idea of the researcher being directly involved in the research is the primary difference between qualitative and quantitative research, which requires the researcher to be completely detached from the phenomenon being investigated (Williams, 2007).

Mixed Method Research is an extension of both quantitative and qualitative approaches, with the aim of benefiting from the strengths of each and minimising the weaknesses of both approaches. The ability to combine data methods from both approaches allows the researcher the ability to both test and create theories (Williams, 2007).

To attain the objectives of this research, this research finds that a qualitative approach as the most suited of the three approaches due to the depth of understanding and flexibility it allows the researcher. Denzin & Lincoln (1994) consider qualitative research to be a multi-method type of research that uses a realistic approach towards exploring its subject matter. Denzine &

Lincoln (2000) as cited by Esch & Esch (2013) assert that qualitative research may be utilised to address research questions relating to how experiences in a particular field may be made visible and thus create a social construct. The research in this study aims to gain insight from different members of an organisation and, as Schultz (1973) states, “qualitative research employs meanings in use by societal members to explain how they directly experience everyday life realities”.

4.5 Research Methods

After deciding on the research approach, the researcher needs to identify the tools that shall be used to both collect data and analyse it. In the case of this research, the primary methods of data collection will be qualitative interviews. However, different research methods have been explored so as to justify the need for interviews as the primary method of data collection.

4.5.1 Case Study

The study in its present form collects empirical data through qualitative interviews. This is the only method of data collection employed. A case study requires a more exhaustive research criteria that would encompass multiple methods of data collection. This can be an extension of this research when different methods can be employed, but since the research is examining tacit knowledge that can be explicated from a theoretical stand point, other methods such as observations may yield different data on certain forms of tacit knowing. However, the researcher asserts the claim that observations would be most suited for determining formative tacit knowing and relatively weak in determining other forms of tacit knowing. The use of focus groups would also aid in exploring the notion of social tacit knowing and helping to illuminate the difference between shared background knowledge and social tacit knowing. In the world of psychology, brain studies that are carried out to show

which areas of the brain “light up” when certain notions are discussed can be an extension of the study in determining how the brain accumulates its knowledge through the exploration of the internal monologue and other psychology theories. Due to the intensive nature of the analysis to be carried out for the interviews, different forms of data gathering would encompass a scope outside that of the study being conducted. This is primarily due to the research limitations such as time and resources available for this study.

4.5.2 Research Sample

Mason (2010) notes that there are many factors that determine the sample size and literature is limited as to what should be the sufficient size in a particular research. Different qualitative strategies may be used at different stages of the research. The sampling strategy can be either probability based or non-probability based. Probability sampling techniques (including simple random, systematic, stratified and cluster) are usually implemented in quantitative research, whereas non-probability sampling techniques are mostly utilised in qualitative research (Neuman, 2007). This research has adopted a qualitative approach and thus it will explore the different elements of non-probability based sampling techniques. Several techniques of non-probability sampling were explored. The first group of techniques are defined as purposive sampling.

4.5.2.1 Purposive sampling

Purposive sampling is a technique that is used in qualitative research for the identification and selection of information-rich cases for the most effective use of limited resources (Patton, 2002). This involves identifying the individuals, or groups of individuals, that are especially knowledgeable about or experienced with a phenomenon of interest (Cresswell & Plano, 2011). There are numerous forms of purposive sampling, here we examine five:

i.) Extreme or Deviant Case Sampling: This form of sampling examines the highly unusual manifestations of the phenomenon of interest such as outstanding success or notable failures. This strategy tries to select particular cases that would glean the most information. A useful form of sampling if the data being examined has outliers within the analytics that the researcher performs; and the researcher intends to not discount them as incorrect, but rather extreme properties of the phenomena being studied.

ii.) Intensity Sampling: This form of sampling chooses instances that manifest the phenomenon intensely, but not extremely. This strategy is very similar to extreme/deviant case sampling as it uses the same logic. The difference is that the cases that are selected are not as extreme. This type of sampling requires that you have prior information on the variation of the phenomena under study so that you can choose the intense, although not extreme. The ability to account for instances when the phenomena occurs more often than others is useful in grouping particular forms of knowing to certain variances set by the researcher. For example, formative knowing might have greater occurrence (not extreme) when determining what can or cannot be explicated.

iii.) Maximum variation sampling: This form of sampling chooses a wide range of variation on the dimensions of interest. The aim of this is to discover or illuminate central themes, core elements and shared dimensions that cut across diverse samples while at the same time offering the opportunity to document unique or diverse variations. This would be particularly useful in instances where one form of tacit knowing is encountered on a particular variance set in the analysis of the data; thus threading a commonality of existence or dependence on certain situations.

iii.) Homogeneous Sampling: This form of sampling groups together people of a similar background or experience. It reduces variation, simplifies analysis and facilitates group

interviewing. This strategy is used most often when conducting focus groups. In the instance of the research being conducted for this thesis, it can be used to group different employee groups, between supervisors and service workers, to grouping employees of different levels of experience.

iv.) Typical case sampling: This focuses on what is typical, normal and or average. This strategy may be initiated when a researcher needs to present qualitative profile of one or more typical cases. When using this strategy the researcher needs to have a broad consensus about what is average.

v.) Critical Case Sampling: This looks at cases that will produce critical information .In order for a researcher to use this method they must know what constitutes a critical case. This method permits logical generalisation and maximum application of information to other cases because if it's true of this one case, then it's likely to be true for all the other cases. The role of juridical tacit knowing on most instances of attempted explication in the pilot study is an example that this form of sampling might help deduce in the field study.

4.5.2.2 Snowball Sampling

This form of sampling is based on a referral approach whereby a small number of individuals, with specific characteristics, recruit others with these characteristics from their networks or community. It identifies cases of interest from people who know people, who know what cases are information-rich- that is, who would be a good interview participant. The researcher found that this form of sampling was especially effective due to the way he gained access to the organisation of study. The contact of the company presented the research information to colleagues who in turn passed on information to other colleagues who would be most willing to participate and contribute to the research.

4.5.2.3 Convenience Sampling

This type of sampling selects cases based on ease of accessibility. This strategy saves time, money and effort, however, it has the weakest rationale along with the lowest credibility.

This sampling technique was used during the pre-pilot whereby friends and fellow researchers were interviewed so as to enhance interviewing skills of the researcher.

4.5.2.4 Quota Sampling

Quota sampling can be defined as “a sampling method of gathering representative data from a group” (Saunders et. al, 2012). Application of quota sampling ensures that sample group represents certain characteristics of the population chosen by the researcher. To aid the field study, purposive, convenience, snowball and quota sampling were used in some capacity to aid in the preplanning of the field study, the actual study and the analysis of the data gathered from the study. By using multiple sample techniques the researcher believes that the criteria gave a more robust set of data without necessarily incurring the drawbacks of all the different sampling criteria used. The ultimate goal is to gain the best set of data in the perceptions of a workforce, to analysing the data with less generalisation for a higher quality of results.

4.5.2.5 Sample Size, Frame & Criteria

One of the features of qualitative sampling is that the number of cases sampled is often small. This is because a phenomenon only need appear once to be of value. Thus, there is no need for scale as there is no need for estimates of statistical significance. Furthermore, because qualitative investigation aims for depth as well as breadth, the analysis of large numbers of in-depth interviews would resultantly not be manageable for the researcher’s ability to effectively analyse large quantities of qualitative data. However, the small scale approach only works if the researcher has a strong sampling strategy (Ritchie & Lewis, 2003).

The issues that should be taken into consideration when determining the sample size for qualitative research are dependent on the heterogeneous or homogenous nature of the sample population or requirements of the data collection methods employed; for example, looking for commonality if grouping a number of type designated participants. The number of selection criterion required and the degree to which criteria (for example age) are nested are important considerations. The intensive nature of study, whether multiple samples are required, the inclusion of a control sample for instance; and the resources available to conduct the study are also important for determining the sample size (Ritchie & Lewis, 2003).

4.5.2.5.1 Sample Frame

A sample frame is a list or map that identifies most units within the target population. The missing units are referred to as undercoverage.

Frame Evaluation:

When evaluating the effectiveness and efficiency of any sampling frame for qualitative research, it is important as with quantitative research to consider whether the sample frame is comprehensive. That is, all of the target population are included. The full range of dimensions and information needed to inform the sample selection should be covered. This is because sections of society missing from the frame may have different characteristics and indeed different behaviours, opinions and attitudes from those covered by it. This undercoverage may affect results if associated with the subject of enquiry. It is, however, also important to consider overcoverage. Sample members may be listed more than once or the list may contain members considered out of scope for the purposes of the study. Their inclusion in the study could impact on the findings and indeed on the resources. Furthermore, the frame should also contain sufficient numbers in each sub-group to provide the sample size required, as not everyone who is eligible will be willing to take part.

Types of Sample Frames:

There are two types of sample frames usually associated with research practices:

i.) Existing Frames: These comprise of records which were constructed for administrative purposes. As such, they tend not to be designed with research purposes in mind and may not be very well maintained from a research perspective.

ii.) Constructed Frames: Whereas existing frames are already available to the researcher, constructed frames need to be created by the researcher. This is what the researcher of this thesis has settled. Before the start of the field work, and taking into consideration that the research would be conducted at an SME, the researcher decided to make sure to include participants from all sections of the company. Thus, the frame of the research included the following criteria:

1. Have multiple research participants from different parts of the company thus to account for instances when some participants may not respond. For example: if four employees are asked to participate in the research, and they are from the same department, the researcher expects that maybe one or two of the participants would be the ones willing to take part in the research.

2. Make sure that there are participants at both floor and managerial levels, thus account for the number of ground floor employees interviewed and those from managerial level interviewed.

3. Make sure that there are participants of different levels of experience within the organisation in most of the departments of the research organisation.

The different forms of sampling discussed allow for the researcher to achieve the three sample frames discussed above.

4.5.2.5.2 Saturation

Failure to reach data saturation has an impact on the quality of the research conducted and hampers content validity (Bowen, 2008; Kerr et. al, 2010). A researcher must address the question: “how many interviews are enough to reach data saturation (Guest et. al, 2006).

Saturation by Method of Data Collection:

By setting a sample frame for the interviews that will take place, then the researcher can achieve data saturation. Bernard (2012) stated that the number of interviews needed for a qualitative study to reach data saturation was a number he could not quantify, but the researcher “takes what he can get”. Moreover, interview questions should be structured to facilitate asking multiple participants the same questions, otherwise one would not be able to achieve data saturation as it would be a constantly moving target (Guest et al., 2006). Thus, to further enhance data saturation, Bernard (2012) recommended including the interviewing of people that one would not normally consider. He also cautioned against the “shaman effect”, in that someone with specialised information on a topic can overshadow the data, whether intentionally or inadvertently.

The Researcher’s personal lens and Data Saturation:

The role of the researcher is an important element to assess when determining or addressing the challenges of data saturation. This is because no researchers assume that they have no bias in their data collection and may not recognise when the data is indeed saturated.

However, it is important to remember that a participant’s as well as the researcher’s bias is present in all social research, both intentionally and unintentionally (Fields & Kafai, 2009).

To address this element of a personal lens in the qualitative research, the researcher is the data collection instrument and cannot separate themselves from the research (Jackson 1990).

Thus, it is important to state that the researcher operates between multiple worlds while

engaging in research, which includes the cultural world of the study participants as well as the world of one's own perspective (Denzin, 2009). Thus, it then becomes imperative that the interpretation of the phenomena should represent that of participants and not of the researcher (Holloway et. al, 2010) in order for the data to be saturated. By taking consideration of this view and mitigating the researcher bias, then once the elements of the theoretical framework that was created in Chapter 3 of this dissertation and the sampling criteria in Chapter 4 are met, then the researcher determines that saturation has been reached if all elements of tacit knowing that were predicted have occurred in the data analysis and thus can be replicated. This form of data saturation that takes into consideration the researcher's personal lens and the theoretical framework created for the research allow for the researcher to be confident that data saturation has been achieved when most elements of tacit knowing have been recognised in a sample frame.

Triangulation and Data Saturation:

Data saturation can be attained through a number of methods, however, the researcher should keep in mind of the importance of data triangulation (Denzin, 2009). Thus, to be sure the way in which triangulation is executed will determine the validity and reliability of the results. Fusch (2008, 2013; Holloway et. al., 2010) suggested that triangulation may involve multiple external analysis methods concerning the same events and validity of the process may be enhanced by multiple sources of data. This research has performed a philosophical analysis (Chapter 3) on existing literature of tacit knowledge and an empirical study of tacit knowledge; both sources of analysis have provided the researcher with different levels and perspectives of the same phenomenon. Data saturation can be attained if the researcher determines that most elements of the phenomenon theorised have been discovered. O'Reilly & Parker (2012), however, warn that the researcher should keep in mind that the triangulation of data can result in contradictory or inconsistent results, and thus it is up to the researcher to

make sense of them for the reader and to demonstrate the richness of the information observed from the data. In this research, the researcher was able to determine that the philosophical analysis could be performed on all tacit knowledge literature to disseminate between different types of tacit knowledge being discussed in literature. This allowed the researcher to have confidence that the theoretical framework worked in principle in being able to discern different forms of tacit knowing. Thus, the only thing left was to compare whether similar results would be achieved in the empirical study.

Review of chosen interviews: In this research 10 interviews from one organisation are used and only 6 are used in the creation of data that will be analysed for the research. Some interviews (2 interviews were collected from a second organisation, but lost access meant that they were not enough to proceed) from a second organisation are considered, but also not used during the analysis due to their lack of depth and information necessary to create a framework around them. The different interviews reviewed were from the different sample frames described in section 4.5.2.5.1. It should be noted that during the analysis, due to the intensive nature of the analysis process, the researcher decided to choose the answers from each of the different questions that provided the most information different from other interviews.

4.5.3 Triangulation

Miles and Huberman (1994) identified five different kinds of triangulation in qualitative research:

- i.) Triangulation by data source (“data collected from different persons or at different times or from different places).
- ii.) Triangulation by method using different methods (Using different methods such as observations, interviews, documents).

iii.) Triangulation by researcher (involving multiple researchers in an investigation).

iv.) Triangulation by theory (use of different theories to explain results).

v.) Triangulation by data type (For example: Combining quantitative and qualitative data).

This research has utilised triangulation by method (multiple methods) since it has undertaken both a philosophical analysis of existing tacit knowledge ideas and an empirical study into tacit knowledge. The philosophical analysis of the literature led the creation of a theoretical framework which was then applied successfully to current tacit knowledge understandings. This further informed the researcher that empirical testing was needed to gain better insight into whether the framework can exist beyond a priori state.

Triangulation by method or methodological triangulation is defined by Kopinak (1999) as “gathering information pertaining to the same phenomenon through more than one method, primarily in order to determine if there is convergence and hence, increased validity in research findings.”

The convergence of the philosophical analysis of the literature on tacit knowledge and the empirical study carried out will lead to increased validity of the results. Smaling (1987) as cited by Meijer, et al., (2002) determines that there are three approaches to the analysis of qualitative data while using methodological triangulation:

i.) Intuitive approach: “where an individual researcher intuitively relates data from various instruments to each other.”

ii.) Procedural approach: “the focus is on documenting each step that is taken in the triangulation by method procedure in order to make it transparent and replicable.”

iii.) Intersubjective approach: “through which a group of researchers tries to reach agreement about the steps taken in the methodological triangulation procedure” (MEIJER, et al., 2002).

With respect to this study, a procedural approach has been taken whereby an aspectual analysis has been carried out, documented and can be replicated in other studies.

4.5.4 Interviews

Interviews can be categorised in two basic structures: structured or unstructured. Nichols (1991) defines unstructured/ open-ended interviews as “an informal interview, not structured by a standard list of questions. Fieldworkers are free to deal with the topics of interest in any order and to phrase their questions as they think best.” In the case of interviews, both structured and unstructured interviews will be conducted. This allows the researcher to account for interviewees who have little time to spare and those who can offer a substantial amount of time to the research. The research in this dissertation will include a pilot study before the main study interviews begin. Thus, semi-structured interviews would be the preferred tool of research at that stage. Additionally, this type of interview may shed a new light on issues that the interviewer had not considered which can be implemented in the main study. (Wimmer & Dominick, 1997:139). In the case of structured interviews, the range of possible outcomes/answers to a question is known in advance. The interview is standardised using a preconceived list of answers for the interviewee to select from. “There is little freedom or flexibility due to the fixed question order” (Oatley, 1999). Due to the volatile nature of the time given by interviewees for the research, utilising a structured interview for those respondents with little time for the research can be the only way to gather data from a subset of actors in the scope of research.

4.5.1.1 Justification of Qualitative Interviews

From the main aim of this research, the explication of tacit knowledge is one of the primary goals. To explicate means to explain and the easiest way to explain our world is through spoken word. Talking is what separates or elevates us from the natural world (Myers, 2009). This basic suggestion can be the starting point to suggesting why one of the best ways to illuminate tacit knowledge is through interviews. Interviews allow us to gain insight into the social and cultural context that the participants of the research inhabit. Myers (2009) expounds on this by asserting that interviews allow us to formulate a greater understanding of the everyday workings/experience of the research participants and the organisation which they work within. Within this study, the researcher intends to gather the perceptions of a workforce in order to gain insight into tacit knowledge. Interviews allows the researcher to gain this insight in a manner that allows for face to face interactions that would illuminate certain forms of tacit knowledge that would otherwise not be explicated in a different form. For example, if research into tacit knowledge was to use observations as a way of gathering data, most forms of tacit knowing that are explicable, such as juridical, ethical and pistic forms of tacit knowing would be extremely difficult to explicate. This is because they function post-lingually, as described in Chapter 3, and would thus need conversation or talking to be illuminated. Observations would be best suited to exploring formative tacit knowing. This is to do with examining skills and how experience affects how tasks are conducted. It is the assessment of the researcher that observations might be better at achieving explication of formative tacit knowing. However, gathering insight into other different forms of tacit knowing requires that there is verbal interaction between the researcher and the participant. Thus, this is why the researcher considers semi-structured qualitative interviews as the best form of data collection to gaining insight into more forms of tacit knowledge.

4.5.2 Participant and Researcher bias

When we focus on human elements of the research process we have to examine the different forms of bias that emanate from both the researcher and the participants. This allows the researcher to account for them, thus minimising the impact they have on the results of the research.

Research participant bias:

i.) Acquiescence bias: Also known as “yea-saying” or the friendliness bias, acquiescence bias occurs when a respondent demonstrates a tendency to agree with and be positive about whatever the moderator presents. As such the participants seem to think that every idea is a good one and can see themselves acting upon every situation that is proposed. It is important to note that some people have acquiescence personalities, while other acquiescence because they perceive that the interviewer is the expert in the situation. Thus the researcher must be acutely aware of the kinds of questions that imply that there is a right or wrong way to answer the question being asked during the interview.

ii.) Social desirability bias: Dodou & Winter (2014) note that this bias involves that the respondent answer questions in a way that will lead to being accepted and liked. Regardless of the research format, they insist that the participants will want to inaccurately report on sensitive or personal topics to present themselves in the best possible light. Researchers must thus try to minimise this bias by focusing on unconditional positive regard. This includes phrasing questions to show that it is acceptable to answer a question in a way that is not socially desirable. The researcher may also focus on asking about what a third party thinks, feels and how they will behave which allows for the respondents to project their own feelings onto others and still provide honest and representative answers.

iii.) Habituation bias: In cases of habituation bias, the respondents provide the same answers to questions that are worded in similar ways. This is a biological response: being responsive and paying attention takes a lot of energy and thus to conserve energy our brains habituate or go on autopilot. Respondents often show signs of fatigue, such as mentioning that the questions seem repetitive and thus researchers must keep the engagement conversational and continue to vary question wording to minimise habituation.

In terms of Researcher bias, below are a number of types examined:

i.) Confirmation bias: One of the longest-recognised and most pervasive forms of bias in research, confirmation bias occurs when a researcher forms a hypothesis or belief and uses the research participants' information to confirm that belief. This takes place in the moment as the researchers' judge and weight responses that confirm their hypothesis as relevant and reliable while dismissing evidence that doesn't support a hypothesis. Confirmation bias also extends into the analysis of the data with researchers tending to remember points that support their hypothesis while dismissing evidence that doesn't support a hypothesis. Confirmation bias is deeply seated in the natural tendencies people use to understand and filter information, which often leads to focusing on one hypothesis at a time. Thus in order to minimise this type of bias, the researcher must continually re-evaluate impressions of the respondents and iteratively challenge the pre-existing assumptions and hypothesis leading their research (Rabin & Schrag, 1999).

ii.) Question-order bias: One question can influence the answers to subsequent questions thus creating a question-order bias. Respondents are influenced by the words and ideas presented in questions that impact their thoughts, feelings and attitudes on subsequent questions. While this form of bias is sometimes unavoidable, asking general questions before being specific,

unaided questions before aided questions and sometimes positive questions before negative ones may minimise bias.

iii.) Leading questions and wording bias: Elaborating on a research participants may inadvertently put words in their mouth. While leading questions and wording are not types of bias themselves, they lead to bias or are a result of bias. Researchers do this because they are trying to confirm a hypothesis, build rapport or overestimate their understanding of the respondent. Thus, in order to minimise this form of bias the researcher should ask questions that use the respondents' language and inquire about the implications of a respondent's thoughts and reactions. Thus, the researcher should attempt to not summarise what the respondent says in their own words and should not take what the participants said further. Malhotra et. al (2007) advises researchers to try not to assume relationships between a feeling and a behaviour.

iv.) The Halo Effect bias: Researchers and participants have a tendency to see something or someone in a certain light because of a singular, positive attribute. There are a number of cognitive reasons for the halo effect and thus researchers must attempt to tackle it on multiple fronts. For example, a researcher can make assumptions about a respondent because of one positive answer they have provided. Researchers should therefore reflect on their assumptions about each respondent. Researchers should address all questions about one situation before asking for feedback from a second situation; because the participants are likely to project what they feel about the first situation on to another situation (Luttin, 2012).

Thus, by the researcher asking good quality questions at the appropriate time and remaining aware and focused on sources of bias, the researcher can enable a higher validity of the data he gathers from the interviews and ensure the resulting conclusions are of a high qualitative standard.

4.6 The Field Work

Walsham (2006) states that “the setting up and carrying out of fieldwork is the fundamental basis of any study.” This section will describe how access was gained to the organisation and also how it was maintained. It will also give a background to the organisation and justify why it was chosen. It will describe the pilot study and how it influenced the main study and the process that governed the collection of data.

4.6.1 Gaining Access

Walsham (2006) notes that a researcher must gain and maintain good access to appropriate organisations for their fieldwork. Good social skills are the most important attribute that is required for this to happen; and more importantly individuals can work to improve their social skills if they have the courage to confront their current position in this respect. A researcher must also be prepared and willing to accept that they might not gain access immediately and must persist to try elsewhere if they are refused. The researcher in this study was refused access to a few organisations before gaining access to a research organisation. There was considerable difficulty in gaining access for this study due to the nature of the research.

The researcher was able to gain access to Axion Recycling Ltd and Bettaveg two SMEs based in Manchester.

4.6.2 Background of Research Organisation

These two organisations provided access and granted permission to conduct the interviews with the workforce. This study was to be initially conducted in a singular organisation. However, due to circumstances beyond the control of the researcher, the research had to

utilise two organisations so as to have enough interview data to conduct the analysis effectively.

The research was conducted at two Manchester based firms: Axion Recycling Ltd (a plastic fabrication company) and Bettaveg, a fruit and vegetable wholesale supplier. At this stage of the research, most of the interviews have been obtained at Bettaveg, and for purposes of continuity, the primary analysis will be on Bettaveg.

However, the interview data collected from Axion Recycling Ltd will be aspectually analysed, but separately from the overall research aim at this stage of research. Axion Recycling Ltd are resource recovery experts. Based in Salford and Manchester, they house one of the most advanced plastics recycling facilities in Europe; separating, purifying and compounding post-consumer and post-industrial mixed plastics feedstocks.

The team is comprised of experienced chemical engineers, polymer specialists, field consultants, recycling project managers, project administrators, researchers, analysts and marketing and communication specialists. Having these arrays of differing actors in the research should prove useful at the analysis stage.

Established in 2002, Bettaveg supply & deliver wholesale fruit & vegetables to the North West of England. It is a much smaller company than Axion, having just under 30 employees. They comprise of a sales and marketing team, management staff, drivers and administration staff responsible for the day to day running of the company. The diversity in professions fulfils the criteria identified in the pilot study for a large range of professions within the company so as to increase the chance of different views on relatively similar questions.

4.6.2.1 Criteria For Choosing an SME

Hari, et al., (2004) citing Collision & Parcell (2001) suggest that knowledge capture means capturing know how in such a way that it can be reused. There needs to be a link between capturing knowledge before, during and after the objective has been executed. However, in this case, we are trying to capture or explicate tacit knowledge using interviews as a source of data instead of direct observation of the participants. Thus the process of knowledge capture has already occurred for the participant, and the researcher is attempting to explicate the tacit knowledge that has been captured individually and socially as an organisation.

In relation to an SME in this case, there are a few social areas that need to be considered in order to fully gain insight into the participants' environments:

- i.) Culture of the organisation: The biggest barrier to knowledge capture in most SMEs is the culture of the organisation whereby most of the knowledge that governs the running of the company is tacit in nature (Rohana & Kamaruzaman , 2009). What the company considers important dictates what the employees' attitudes towards certain elements of the organisation are and this informs their view or perspective of their enclosed world within the organisation. Thus the tacit knowledge is held in both individuals and collectively as an organisation.
- ii.) Knowledge capture in SMEs mostly occurs in informal networks, but as the organisation grows these networks are usually not aware of the entirety of the knowledge contained in them, specifically tacit knowledge. In the case of reviewing tacit knowledge, these informal networks may prove to be a good source of tacit knowledge not yet explicated.
- iii.) Communication: The way in which a workforce in an SME communicate with each other is crucial to determining the knowledge flow within the company. Communication structures help inform the researcher how social tacit knowing might be forming or areas of

commonality that foster tacit knowledge and thus ultimately informs the researcher what kind of questions to ask if trying to account for social tacit knowing.

iv.) Structure of the organisation: The hierarchical structure of an organisation is important to examine if the researcher wants to account for different perspectives throughout the organisation. A manager will consider some issues more important than others, as will the workforce working under them. Thus, what people consider most important informs what rationale they envisage for their positioning within the organisation. This may then influence the kind of tacit knowledge that they harbour while working from a particular rationale.

In the case of this dissertation, the SME organisations that have been chosen are from the fields of plastics processing and wholesale food distribution. As two SMEs chosen for research, they operate within very different markets, harness very different expertise and as such would produce a diverse range of employees from both to be able to gain as broad a perspective the type of personnel interviewed for greater diversity and in turn validity of results. According to the four elements documented above in choosing an SME, Axion and BetteVeg would check the following:

I.) Culture of organisation (i) & Structure of Organisation (ii): Axion has a multi-department structure whereby different teams make up the company meaning that the culture is diverse in terms of skill assignment. There are engineers, laboratory workers, commercial and customer management staff and product development staff. This provides a platform for exploration in terms of how tacit knowledge may be collectively held within the company; within individuals, within departments and within the whole company as a whole. BettaVeg follows the same kind of structure, but on a smaller scale and thus the interactions between management staff, transport staff and other departments is much more integrated and this also presents an opportunity to explore how tacit knowing functions within these settings.

II.) Knowledge capture within the organisations (iii) & Communication (iv): Knowledge capture within both organisations is through informal networks and although Axion has a more robust structure of knowledge capture in the form of documented processes within the engineering departments, both provide a platform for examining how socialisation within the organisation helps or hinders the sharing of tacit knowledge. Especially with the informality of BetteVeg which is dependent on informal interactions between employees in order to function optimally. Most forms of tacit knowing can be researched within these conditions and this provides an ideal setting for studying tacit knowledge within SMEs based in the UK.

4.6.3 Pilot Study

A pilot study is a small study designed to help a further confirmatory study (Arnold, et al., 2009). These studies are used for various purposes such as testing the research procedures, estimating the recruitment numbers and establishing parameters of the research. The pilot study was used to inform the researcher on decisions about who should be interviewed, construct a schedule and enable the research design to be applied and tested.

The pilot study was also used to gauge the responses on the questions asked and aid in performing a primary analysis so as to help design a framework for arranging the data collected. This proved an essential step since it allowed the researcher to determine that semi-structured qualitative interviews were the better choice compared to open interviews in such a study. Ultimately, the pilot study acted as a platform for the researcher to improve their interview conducting techniques.

4.6.3.1 Process of the Pilot

At the start of pilot study the format of the questions that the researcher asked were open in nature (open interviews), and the researcher hoped that this method would be the most appropriate for gathering raw data which can later be analysed to find different forms of tacit knowing. However, after the first few interviews it became clear that the researcher needed to create a malleable structure for the interviews to illuminate different forms of tacit knowing.

This led the researcher to design an interview criteria, called an intuition criteria, that asked the most likely questions that the researcher thought would lead to a specific type of tacit knowing.

This intuition criteria did not utilise Dooyeweerdian philosophy and should not be confused with aspects. The researcher intends to use aspects, as governed in aspectual analysis, at a later stage to perform the final analysis of the data from the interviews.

4.6.3.2 Intuition Criteria

It is exceedingly difficult to identify tacit knowledge without prompting the interviewee to answer questions that may harbour pathways towards illuminating tacit knowledge. Thus, the construction of the interview questions has been guided by what we understand tacit knowledge to be in its basic form; which is human intuitions.

The researcher has designed this intuition criteria table based on the initial framework in section 3.6 of this dissertation, to help enable the creation of questions that aid in revealing forms of tacit knowing.

The table incorporates figure 3 (aspects of knowing) into the questions although as Klein & Myers (2009) suggest that Dooyeweerd can be utilised as a critical theory. Thus in using different terms for generating the intuition questions, the interviewee might not be led to answering directly to a certain type of tacit knowing.

Intuitions	Aspects of knowing	Possible questions
Feelings	Psychic	Their personal feelings on their role in the company
Mental Learning	Analytic	How difficult is it to acquire or apply new skills
Skill Learning	Formative	‘What did your role involve?’
Expressing	Lingual	Teaching (How would they explain what they do to someone else?)
Relating to others	Social	Communication through the company
Seeing the whole	Aesthetic	Did people believe in the Mission Statement /enjoyment of tasks as a whole?
Frugality	Economic	Usage of resources in the firm
Rightness	Juridical	The ethics of what they do in their role/ or what the company does in the world
React to others / Feel about different scenarios	Ethical	Determining Empathy
Certainty	Pistic	May relate to future of organisation

Figure 5 Intuition Criteria based on Figure 3 (Basden, 2008)

The intuition criteria is developed using the properties of aspectual knowing determined from the theory of knowing. The limits of what can be known are not hindered by focusing on the questions that may lead to information about a certain kind of knowing. Through inter-aspect reaching out as shown by figure 2 in chapter 3 of this dissertation, what is known can be relative to all the aspects of functioning.

4.6.3.3 Findings of the Pilot

At the beginning of this research, it was the intention of the researcher to explore all avenues of theoretical tacit knowing. However, it is becoming clear that due to the method of data collection, most forms of tacit knowing that can be identified exist post the social functioning on Dooyeweerd’s modal aspects range.

The table has excluded all forms of tacit knowing before the psychic knowing stage and also both analytic and lingual aspects which are explicit in nature, but have tacit elements to their functioning.

Figure 6: Types of Tacit Knowing Explored in Interviews

Tacit Knowing Aspect	Psychic	Formative	Social	Economic	Aesthetic	Juridical	Ethical	Pistic
-----------------------------	---------	-----------	--------	----------	-----------	-----------	---------	--------

{
 Most forms of tacit knowing identified through interviews fall within this
 range of knowing
 }

Tacit Knowing Aspect	Physical	Biotic	Analytic	Lingual
-----------------------------	----------	--------	----------	---------

{
 Cannot be investigated in an interview setting but through inter-aspect reaching out can be suggested
 }
{
 Explicit in nature, but have tacit properties.
 }

Interviews are a lingual form of research and thus most data collected seems to indicate a post-lingual functioning. This is not a limit, but suggests that the method of data collection

may affect what form of tacit knowing can be identified or the ease of identifying different forms of tacit knowing. Both psychic knowing and formative knowing are much more difficult to identify using interviews, but can be speculated due to foundational dependency as explained in section 3.3.1.

It is important to note that this does not set a limit on what can be investigated by interviews, but through the initial framework, physical and biotic forms of knowing cannot be investigated using interviews, but can still be speculated to using foundational dependency and also inter-aspect reaching out to them through aspectual functioning.

Functioning in later aspects as presented by Dooyeweerd, requires functioning in earlier aspects as well. Thus, functioning in post-lingual knowing requires functioning in earlier aspects such as psychic knowing and formative knowing.

Another major finding of the research so far is how influential the notion of shared background knowledge affects the research criteria. Although not conscious and of social functioning in nature, shared background knowledge in most instances does not indicate direct functioning in the social knowing criterion. What this indicates is that a person/organisation can have social tacit knowledge functioning at social knowing level, but also can have tacit knowledge about a situation/thing. The difference can be illustrated as:

X: Being a form of aspectual functioning; we can have:

→ X aspect of Tacit Knowing

&

→ Tacit Knowledge of an X aspect

In this instance shared background knowledge would normally fall under “Tacit knowledge of an X aspect”. Whereas most of this research is attempting to identify “X aspect of tacit knowing”. It is important to note that at this stage of research, most of the tacit knowledge in shared background knowledge has been of a social functioning in nature, but the researcher is not ruling out the possibility of different aspectual functioning.

The main study improved on the pilot study by making sure that the questions asked during the interview process would cover the range identified in the pilot study. The pilot study also informed

4.7 Data Collection

The primary method of data collection for this research is qualitative interviews. The research made sure to interview staff at different levels of the organisation. At this early stage of the research only ten interviews were conducted. The questions ranged from asking them about their role in the organisation to how they perceive both their future within the organisation and the future of the organisation itself. The semi-structured nature of the questions did not hinder the open-ended element of the questions asked; and this was determined by the nature of the answers received.

4.7.1 The Interview Process

A qualitative approach governed the way the research method of semi-structured interviews would be conducted. As shown in the pilot study findings, the researcher created an interview criteria to better illuminate different areas of tacit knowing in the interviewees.

Once access was gained in the organisations, a schedule was created as to when it was possible to interview the workforce. The interview times ranged mostly during lunch hours and late afternoons after work so as to not disrupt the workings in the organisation. Before this the participant information sheets were distributed within the organisations and those

who were interested in the study sent an email to the researcher and scheduled an interview time.

In both organisations there were designated interview rooms so that the interviewee felt comfortable in the setting and so as to not have many distractions.

Once the interview set up was ready the researcher introduced himself while presenting the participant information sheet if the interviewee did not have their copy with them. The researcher then gave a brief explanation of how the interview would be conducted.

Once the researcher had explained the process of the interview, and the interviewee was happy to continue with the interview, they were then presented the research participant consent form to sign. Once this had happened it was ready to proceed with the recording of the interview.

Once the interview began, the researcher followed an interview guide to the questions, that had been developed using the intuition (interview) criteria (designed during the pilot study), to construct a structure to the interview. It must be said that there was no rigidity in the way the questions were asked thus, the earlier developed questions made using the interview criteria were malleable depending on how the answers or questions the interviewee had.

Once the interview had ended, the researcher then asked whether the interviewee had any questions about the research or if they had anything to add that they thought that the researcher had missed. In this instance the researcher is allowing the interviewee to illuminate a rationale they consider important and thus may harbour a form of tacit knowledge. From a theoretical standpoint it is this extra detail not asked by the interviewer that usually leads to a form of tacit knowledge being illuminated.

In total there were twenty interviews conducted, five during the pilot and fifteen during the main study where five interviews were collected from Axion and ten from BetteVeg. The study reviewed ten of these interviews in detail due to the nature of the aspectual analysis. The selection of those chosen for review was based on how rich the answers given were, and those interviews without much data in the answers were not reviewed. The researcher performed a review of three of those interviews not selected to see if the results would be different, but found that they only gave less results thus the study wasn't affected by omission of relatively poor interviews. The profile of the interviews can be summarised in the following table:

Figure 7: Profile of Interviews Used in Research

INTERVIEWS	STAGE OF RESEARCH	EXAMINED IN DETAIL
Organisation: Axion Floor (A F), Axion Mgmt (AM) BettaVeg Floor (BF) BettaVeg (BM)	Pilot (P), Main Study (M)	(EID) NOT EXAMINED (NE)
A	P	EID
A	P	EID
AM	P	EID
A	P	EID
BF	M	NE
BF	M	EID

BF	M	EID
BF	M	EID
BF	M	EID
BM1	M	EID
BM2	M	EID

The participants chosen from both organisations have been separated into management and floor staff. The floor staff in the table above represent, in Axion: Engineers, Laboratory and transport personnel. Within BettaVeg they represent everyone within the company except for the two managers who were interviewed.

4.7.2 The Questions asked during the interview

As guided by the intuition criteria, the questions asked follow a malleable structure that creates a flow in the interview process that would otherwise be lost. It is particularly used to see whether we can illuminate different types of tacit knowledge by asking certain questions. The form that these questions take might be different during the interview process, but are alluding to the same thing. It should be noted that a review of the questions in terms of aspects has been carried out in some instances, however, aspects themselves, as described in literature, have not been used to create the questions.

The first question asked is: “What is your role in the organisation?” The purpose of this question is to find whether we can illuminate **formative tacit knowing**. This is as described by both Polanyi and Nonaka & Takeuchi in terms of tacit knowledge embedded in skills.

The second question asked is: “How do you feel about the role?” The purpose of this question is to find whether we can illuminate elements of both **psychic** and **aesthetic** tacit knowing.

Since psychic tacit knowing cannot be fully explicated, a question like this might give you a suggestion as to the base reaction of the participant thus implying a form of psychic tacit knowing. It must be noted that this attempt might only illuminate aesthetic knowing in the explicit sense as the participants describe their satisfaction/lack, thereof, in their role.

The third question asked is: “How did the training proceed or how did you learn new skills for your role?” The purpose is to try and illuminate **formative** tacit knowing.

The fourth question asked is: “How would you proceed with training someone else in what you’ve learned?” This tries to illuminate **formative** and **social** tacit knowing. However, in the aspects of everyday experience the question lies in the formative aspect, but tries to show different forms of tacit knowing.

The fifth question asked is: “What is the structure of communication within the company?” The purpose of this question is to try and illuminate **social** tacit knowing. However, as found in the pilot, most types of knowing in this question show shared background knowledge, which functions in the explicit, and is not tacit knowing.

The sixth question asked is: “Were there ethical considerations you had to make at a personal level that complimented the company’s ethical procedures?” In the explicit sense, this question hopes to illuminate **juridical** tacit knowing. This question is an example of how functioning in the aspects can be different to forms of tacit knowing. Juridical aspect of experience is not the same as juridical tacit knowing. However, it should be noted that this is a review of the question itself in terms of aspects, as opposed to using the aspects themselves to formulate the question.

The Seventh question asked is: “When you think about the general satisfaction around the company or your general sense of satisfaction within the company, what are your thoughts on this?” This question hopes to illuminate **aesthetic** tacit knowing.

The eighth question asked is: “So when it comes to the overall mission statement that the company wants to adhere to, do you think that there is anything that you had to follow that either limited that or encourage/complimented that notion?” This tries to illuminate **pistic** tacit knowing.

The ninth question asked is: “How would you describe the knowledge flow within the company in terms of procedures that you had to follow to the letter or things that you had to employ by yourself in order to be efficient within the skill base assigned?” This tries to illuminate **economic** tacit knowing.

The tenth question asked is: “Do you feel that the company has an ethical standing towards the market/environment it exists in?” This tries to illuminate **ethical** tacit knowing.

The eleventh question is: “Overall, do you enjoy your job?” This tries to show **aesthetic** tacit knowing.

Final question asked is: “Is there anything that you feel is important that I’ve not asked you about the company or your own positioning within the company?” All forms of tacit knowing may be illuminated with this kind of question.

4.8 Research Analysis

Once the data from the qualitative interviews has been collated, the research will use aspectual analysis as opposed to M.A.K.E (Multi-Aspectual Knowledge Elicitation) method to identify the different types of tacit knowledge at the organisation.

4.8.1 Multi-Aspectual Knowledge Elicitation

Mike Winfield, University of Central England, devised a method that helps widen the focus during knowledge acquisition: MAKE, Multi-Aspectual Knowledge Elicitation (Winfield, 2000). “MAKE is a method for analysing someone's knowledge to obtain a rich picture in which all relevant aspects are made explicit. That is to explicate all that is meaningful to the person. MAKE is particularly useful for explicating tacit knowledge or rather knowledge that is taken for granted” (Basden, 2001). It contains ideas from Clouser (1991), Stafleu (1987) and Thagard (1992) about what theories are, and makes use of Dooyeweerd’s (1955) suite of aspects.

Basden (2001) says that MAKE recognises two things about experts:

- i.) The true expert will be functioning in all of Dooyeweerd’s aspects as they go about their expert activity, but much of this will be tacit knowledge.
- ii.) There will usually be a couple of aspects of which the expert is aware, that constitute the core aspects of their expertise. Thus the method starts by focusing on those core aspects, and then widens the focus from that starting point by using Dooyeweerd’s aspectual suite. MAKE contains the following steps:

0. Briefly explain to the interviewee what each of Dooyeweerd’s fifteen aspects refer to. It is helpful to make available a list of the aspects for reference during the interview.

1. Start with a statement of requirements.

2. Working with the interviewee, apply the aspectual template to the statement of requirements and identify the important aspects.
3. Isolate one of the aspects identified in (2) and specify any laws, axioms, data, definitions and constraints that apply within it to the domain.
4. Identify as many concepts as possible that lie in this aspect. (Note: May need to check later whether the concepts fall in the correct aspect)
5. Apply Low Level Abstraction (Clouser, 1991) to expand on each concept that needs (or is thought to need) exploding. This should identify new concepts and the links between them.
6. Repeat steps 3-6 as necessary. (This means working with other important aspects and also some circularity in steps 3-5.)
7. Use the aspectual template to identify any new aspects that might apply to the concepts already specified, building bridges between concepts and aspects. (Winfield, 2000) as cited by Basden (2001).

This process can be applied to the interview data collated in this research, although the process would need to account in detail the properties of the aspects being researched such as inter-aspect reaching out and the dependency. Having reviewed Winfield's (2000) interpretation of the meaning contained in Dooyeweerd's aspects, as with Basden, the researcher's interpretation differs of aspects such as the ethical aspect, the data gathered from MAKE might be slightly different. However, the researcher concludes that MAKE is an excellent alternative to performing aspectual analysis to the steps used in this research.

Other forms of analysis that utilise Dooyeweerd's aspects include M.A.I.T (multi-aspectual interview technique) by Kane (2006) which takes the MAKE technique into new areas. M.A.I.T also uses Dooyeweerd's aspects, but whereas MAKE investigates the knowledge

that people have already developed, M.A.I.T investigates people's aspirations, hopes and opinions. Basden (2012) summarises, "Whereas MAKE applies aspects to the past, MAIT applies aspects to the future."

4.8.2 Aspectual Analysis

Basden (2008) states that "aspectual analysis involves noting the ways in which each aspect expresses itself in the situation being analysed, often seeking balance." All situations and human functioning are multi-aspectual in nature, which in turn accounts for the complexity of everyday life.

By using the suite of aspects as narrowed down in Chapter 3.1.2 to accommodate the functioning of tacit knowing, the research is able to examine the interview data to determine where each statement made by an interviewee lies within the spectrum of tacit knowing.

Some aspects will become more prominent for some interviewees than others and this indicates what aspect is most important to that person. Additionally, if the process is repeated for a larger group, then the research expects to see a pattern emerge whereby we can determine the most important aspect for the management subset of interviewees relative to the rest of the interviewees. For each question asked by the researcher, an aspectual analysis will be performed of the answer to identify if any tacit knowing markers can be observed.

4.8.3 Presentation of Analysis

Each interview will be examined separately at first. The transcript of each interview will be dissected into sections relative to the questions asked during the interview process. This will make it easier to follow the aspectual analysis of each statement. After the question and answer are displayed, the research will attempt to explore the nature of the answer with respect to the different forms of tacit knowing as derived in section 3.1.2. The interview statements will thus be dissected in terms of their tacit knowing functionality.

4.8.4 Sampling in analysis

As mentioned in section 4.4.2, this research utilises the notion of **purposive** and **quota** sampling, whereby the study has already determined the number of people to be interviewed in the research holding different positions within the organisation. Management staff have to be separated from the employees and a certain number achieved for both subsets so as to achieve a satisfactory criteria for analysis. It is expected that the two groups would have significantly different views on similar questions thus illuminating different forms of tacit knowledge.

4.9 Ethical Considerations & Limitations of Study

4.9.1 Ethical Approval

This research was carried out with the approval from and in accordance with the University of Salford Code of Ethics. The approval of the research was dependent upon an ethical review of the study being carried with respect to the information presented to the participants, how confidentiality of the research participants was attained, and what protections for the researcher and research participants were present relative to whether the research presented any danger to them. These areas have been discussed below:

4.9.1.1 Information for the Research Participant

An information sheet was provided to the research participants detailing all aspects of the research. This information sheet has been appended to the dissertation and can be viewed in the appendices section. In the information sheet, a section seeking the consent of the research participant dependent on whether they agree with the information on the sheet gives participants the power to grant or deny interviews to the researcher. In addition to the information sheet there is a withdrawal form. This form acts as a protection for the research participant should they wish to withdraw from the research once the study has begun.

4.9.1.2 Research sensitivity and Confidentiality

In addition to detailing aspects of the research, the information sheet for the research participants also gives the parameters of confidentiality afforded to the research participants. The participants' identities would not be revealed in any of the published research materials and such information would only be accessible by the researcher and the research supervisors assigned to them. All the information collated was stored in secured electronic devices, which were all governed by code restrictions such as passwords and biometric accessible mobile devices.

In relation to sensitive data that was collated from the company relative to the recordings of interviews that contained data that would be seen as critical to the organisation, or recordings of current employees of the organisation who felt that the information of experiences of them working in the organisation would cause friction within the relatively small group of people who work at the company, assurances were made that their interview transcripts would not reveal the identity of the participants and, thus, would not upset the delicate balance communication between employees at the organisation. The recordings were only accessible to the researcher and the university supervisors and would not be revealed to other research participants under any circumstance.

4.9.1.3 Researcher and Participant Safety

The researcher complied with the code of ethics that both the research organisation and the university provided in relation to interaction with human participants. All the safety policies and procedures were strictly adhered to and health and safety policies were also adhered to in order to create a safe environment for both the participant and researcher to interact within. The research participants' daily undertakings during the research were minimally disrupted, with the researcher opting to interview them during the research participants breaks such as lunches or meeting periods which worked best for the research participants.

4.9.1.4 Conflicts of Interest within the Research Domain

The researcher was introduced to one of the research organisations by an acquaintance who had worked in that firm previously. However, this person was not used in the research and thus, the researcher could be deemed as to have had no prior associations to any of the research participants; thus everything was within the ethical bounds of the research.

It was important that this conflict of interest did not hinder the trust between the researcher and the research organisation. One of the primary elements when conducting research within an SME is gaining trust with the employees within the organisation. Liaising with someone who was no longer working at the institution as the first contact point may have been a barrier, but this was not a hindrance to the research since the person had left on amicable terms with the organisation.

The withdrawal from research form was also a useful tool in case anyone felt that the research data they had provided would constitute a rise in conflict of interest, but this was not utilised during the research. The only participants who were not involved in the research were those who indicated they were willing to participate in the research, but never responded once the study had begun.

The research aims to follow the code of ethics adhered to by the University of Salford. An ethical approval form will be submitted before the field research takes place. This form shows the limits of the research and also displays the consent of the research organisation.

4.9.2 Brief summary of the limitations of the research:

The study is carried out at one company and, thus, the results may be skewed in terms of diversity of stimuli studied. This emphasises its situational drawback. From this viewpoint the limitations of the study may be summarised as:

- Strong situational concept.
- Generalisation of the results, since the same method may yield different data in other organisations.
- The Sample of research: Both the size of the qualitative research and also time restrictions will affect the sample data collated for research.
- The use of interviews as the primary data collection method.

An extensive review of the limitations of this research has been carried out in Chapter 7.3 of this dissertation.

CHAPTER 5: Analysis

5.1 Evolution of the analysis: preliminary analysis

The first instance that the researcher employed on analysing the data did not seem to be very fruitful, but since it was this method that led the researcher to developing a more comprehensive research platform it has been included, together with its conclusions, as a way of linking back to the process of creating a more structured analysis. This follows the principle of dialogical reasoning (Klein & Myers, 1999) that requires the researcher to reflect on what they have created thus altering their stance or method of execution due to the data they are collecting.

This chapter will focus on the analysis of the interview transcripts for the purpose of attempting to identify tacit knowledge as defined by the different types covered in Chapter 3.1.2. As explained during the methodology chapter, the interviews are semi-structured in nature and thus the questions mostly follow a unison progression. Since this is the preliminary analysis results the researcher will show four instances that the flawed aspectual analysis took place, but was useful because it resulted in observations that led to a more critical analysis.

5.1.1 Profile of Interviews and Organisation Context of Preliminary Analysis & Aspectual Analysis

In this chapter, four interviews provide the data for the preliminary analysis while six interviews are reviewed for the main aspectual analysis section. The four interviews in the preliminary analysis included data such as age and years of experience in the organisation, while the interviews in the main analysis decided to focus on the whole workforce with the same parameters as the researcher found a better generation of results with the new method.

The implementation of the intuition criterion within the first preliminary analysis was flawed since it did not include other forms of tacit knowing contained within certain questions.

Preliminary analysis interview profile:

Figure 8: Preliminary Analysis Interviews

Interviews	Questions chosen based on intuition criterion (section 4.6.3.2) (Intended form of knowing)
Interview 1: 28 years Old, 3 years of experience	Interview data explores: Part 1. formative Part 2: Psychic
Interview 2: 35 years old, 8 years of experience	Interview data explores: Part 1: Formative Part 2: Formative, Juridical, Economic
Interview 3: 29 years old, 1 year Experience	Interview data explores: Q1: Social Q2: Juridical, Ethical
Interview 4: 38 years old, 8 years of experience	Interview data explores: Q1: Ethical

The structure of questions in relation to the intuition criterion revealed that no singular question could aim for a singular type of knowing. This was the flaw in implementation of the intuition criterion within the preliminary analysis, but was corrected subsequently in the main aspectual analysis.

Main aspectual analysis interview profile

By following the intuition criterion, the researcher has selected questions that aim to explore the 10 forms of knowing suggested by the initial framework in chapter 3.6 of the dissertation.

Figure 9: Main Analysis Interview Profile

Interviews	Questions selected based on Intuition Criteria (Intended aspects of knowing)
Interview 1	Interview data explores: Formative, Analytic, Social, Lingual
Interview 2	Interview data explores: Psychic, Aesthetic, Juridical, Ethical
Interview 3	Interview data explores: Pistic, juridical
Interview 4	Interview data explores: Social, Analytic, Juridical, Economic
Interview 5	Interview data Explores: Psychic, Ethical, Juridical
Interview 6	Interview data Explores: Psychic, Analytic, Formative, Lingual, Social, Economic, Juridical, Aesthetic, Ethical, Pistic

The diversity of the forms of knowing to be identified within the analysis process was dependent on the intuition criterion as a guide to creating the questions needed to reveal certain types of tacit knowing. It was clear to the researcher having performed the preliminary analysis that the intended form of tacit knowing to be investigated would not be directly revealed, but revealed other forms of tacit knowing.

5.1.2 Preliminary Analysis of Interviews

5.1.2.1 Interview 1

Profile: Male, 28 years old, 3 years' experience.

Question 1: "What is your role in the organisation?"

Intended tacit knowing target: Formative knowing

Answer: "It's not the easiest thing to explain. My role is to control the pricing structure of the goods we are selling. It's a small company and there are only ten people working in our sector of the company; so we all cover each other's jobs. But for me it was taking notes of the pricing changes day to day from the market wholesale prices and adjusting our sales prices accordingly".

Analysis:

"It's not the easiest thing to explain": This statement indicates that the interviewee assumes that the researcher will have the knowledge to discern that roles are usually easy to explain. The interviewee and researcher share background knowledge to the statement of "ease of explanation of a role". Additionally, from the definition of economic knowing that this research has conjured, the statement "it's not the easiest thing to explain" can be described as not having enough knowledge to explain the 'situation' efficiently. Thus the statement indicates a negative functioning in the **economic form of knowing**.

"Pricing structure": the interviewee assumes that the researcher should be able to discern what they mean by "pricing structure" from a lingual understanding of the term. However, if we are to explore this term relative to its situational context, the interviewee has left out the reasoning behind the need for control or why there needs to a pricing structure. The researcher can conclude that both the interviewee and researcher hold **social tacit knowledge**

about an economic aspect. It is important to emphasise here that “economic aspect” in this context is not a form of knowing, but rather a description in the wider context of aspectual functioning. Thus, the research cannot conclude to have identified a form of tacit knowing in this context.

“It’s a small company”: The interviewee asserts the assumption that by description of company size, large or small, then there are implications surrounding that company that the researcher can deduce. This is essentially shared background knowledge.

“Only”: The term as used in the answer to the question implies the researcher should tacitly derive the implications of the context of having ten people in a department of the company. The interviewee assumes that the connotations should be easily evident, lingually, to the researcher. Thus, this can also be described as shared background knowledge.

“Our sector of the company”: This suggests that the interviewee views their section of the company as functioning differently to the rest of the company. This research can make a suggestion that the interviewee is implying that the sector of the company holds knowledge collectively; thus functioning in a different way to the rest of the company. As derived from the literature review whereby we can view an organisation as an individual, and thus claim that it can hold tacit knowledge, then we can extend the same view to a sector of the company; viewing it collectively and thus deriving that it holds tacit knowledge. This tacit knowledge is described as **social tacit knowledge**. The interviewee viewing themselves separately from the company implies this collective nature of tacit knowing.

“We all cover each other’s jobs”: From this segment, the researcher must derive why it’s meaningful that the interviewee mentions this statement in the context of the question. The connotation that arises from covering other people’s jobs predicates that there is a shared background knowledge of the implications between the interviewee and researcher. This

shared background knowledge can be described in research terms as both the interviewee and researcher having social tacit knowledge about a social situation. This should not be confused with social tacit knowing as defined in section 3.1.2 of this dissertation; which is one of the forms of knowing that the research is attempting to identify.

“Day to day”: The research can ask the question: why does the interviewee use day to day instead of something else? The specificity infers a form of social tacit knowledge about a social aspect. Thus, although indicating social tacit knowledge, it cannot be described as social tacit knowing.

Forms of tacit knowing identified: Economic tacit knowing, social tacit knowing

Question 2: “What would you say you feel about the role itself?”

Intended tacit knowing target: Psychic knowing.

Answer: “It is challenging. It’s really hard work. I didn’t have a background in that area at all. So at the beginning it was a steep learning curve and mistakes were costly; so it was high pressure”.

Analysis:

“It’s really hard work”: Implies that the researcher and interviewee have a shared background knowledge to understand the implications of such a statement. Thus, they hold social tacit knowledge of a social situation as presented lingually in this segment of speech.

“I didn’t have a background in that area at all”: Implies deficiency in knowledge area, thus assuming that the researcher will understand the implication of the statement. This in turn indicates a negative functioning in the economic tacit knowing.

“Steep learning curve”: This describes social tacit knowledge of an economic situation. From a lingual perspective, the interviewee assumes that the researcher will derive the implications of a situation by presenting it in this dialogue. This can be summarised as social tacit knowledge of a lingual statement.

“It was high pressure”: Similar to the statement ‘steep learning curve’, the interviewee assumes that the researcher has a shared background knowledge of the lingual statement. Again summarised as social tacit knowledge of a lingual statement.

“Mistakes were costly”: Beyond having a shared background knowledge to understand the lingual statement, this segment also suggests an element of situational analysis; whereby the interviewee felt that the mistakes were costly due to how they perceived the consequences of their mistakes relative to the other employees or managers in the company. We can suggest that in the context of the interview, and the researcher examining the reaction of the interviewee at the time, that the notion of psychic knowing might apply. It has to be mentioned that being able to discern psychic knowing is extremely difficult, but the researcher determines that this situation would warrant the suggestion.

Forms of tacit knowing identified: Psychic knowing.

5.1.2.2 Interview 2

Profile: Female, 35 years old, 8 years’ experience.

Question 1: “How would you say you acquired the new skills required for the job in terms of the training process or how the organisation conveyed what you actually needed you to do for them?”

Intended tacit knowing target: Formative knowing.

Answer: “There was a man who walked me through the entire process from the start to the end. It was decided that he would train me in everything I needed to know, and he wasn’t the greatest at the role God help him which was primarily due to bad communication skills, but I understand it was a difficult job to train somebody in because there is so much information to convey; and somebody coming in with no background knowledge is going to struggle. It took a month or two to get a full grasp of the job.

Analysis:

“It was decided that he would train me in everything I needed to know”: This indicates that the company has certainty that the training the interviewee receives would constitute enough knowledge for her to perform the role effectively. This statement harbours two forms of tacit knowing: i.) pistic tacit knowing: The certainty that the company has on the training criteria. ii) Does she have “enough knowledge” to perform the tasks required? Thus indicating economic tacit knowing of the interviewee as assumed by the company.

Forms of tacit knowing identified: Pistic knowing & Economic knowing.

Question 2: “How would you train someone else in the same role?”

Intended tacit knowing target: Formative knowing, Juridical knowing, Economic Knowing.

Answer: “It would be a nightmare! You just have to break it down into manageable segments since you can’t teach everything at once. You have to begin with simple steps so as to minimise the learning curve gradient. Because before you even start thinking about the pricing and all the issues that come with it, you have to examine so many variables that make up the market place. There’s actually, since he trained me, the company has created a handbook on how to train people in these jobs...that’s how hard it is.”

“It would be a nightmare”: The interviewee assumes shared background knowledge to understand the term. In research terms, this statement would be viewed as tacit knowledge about a lingual statement.

“Break it down into manageable segments”: Social Tacit knowledge about an economic aspect.

“Since you can’t teach everything at once”: Aesthetic tacit knowledge about an analytic aspect.

Forms of tacit knowing identified: Tacit knowledge about an economic and analytic aspect.

5.1.2.3 Interview 3

Profile: Male, 29 years old, 1 year experience.

Question 1: “How would you describe the communication throughout the company in relation to both colleagues and the managers?”

Intended tacit knowing target: Social knowing.

Answer: “I would say that it’s not bad. It’s a small company so if people don’t get along with each other nothing is going to ever happen. You can’t overlook the factor of not getting on with your peers as it’s going to be a massive factor. But I always got along with people, my manager was always really nice and accommodating and helpful as well”.

Analysis

“It’s a small company”: The interviewee asserts the assumption that by description of company size, large or small, then there are implications surrounding that company that the researcher can deduce. This is essentially shared background knowledge.

“If you don’t get along nothing is going to ever happen”: Implies both assumption of shared background knowledge and also social tacit knowing due to collective company reference, in this context, when referring to themselves and describing others in sector of company.

Forms of tacit knowing identified: Social knowing

Question 2: “Were there any ethical considerations you had to make at a personal level that either complemented the company’s ethical standing or you had to enforce for yourself?”

Intended tacit knowing target: Ethical Knowing, Juridical Knowing.

Answer: “Any serious issues were catered for by the company. It was common sense really”.

Analysis

“*It was common sense really*” Implies assumption of shared background knowledge. Thus Social tacit knowledge about a social situation expressed lingually.

Forms of tacit knowing identified: None.

5.1.2.4 Interview 4

Profile: Male: 38 years old, 8 years’ experience.

Question 1: “Were there any ethical considerations that you had to make at a personal level or procedures that you had to follow?”

Intended tacit knowing target: ethical knowing.

Answer: “Ummm...struggling to think really. Any serious issues were catered for by the company. There were procedures. I can’t really think how that could have applied. We had to deal with customers all the time. But I mean it was just common sense. There was no strict code which we had to follow.”

Analysis:

“But it was just common sense.” Implies assumption of shared background knowledge. Thus Social tacit knowledge about a social situation expressed lingually.

Forms of tacit knowledge identified: None

This form of analysis indicated to the researcher that it was flawed to have a specific target of tacit knowing target. Although it allowed the researcher to explore the notion of shared background knowledge, there did not seem to be a validity in structure to the method first developed from trial after performing the initial pilot. This decidedly indicated that the researcher required a new way to explore the data in the analysis. Therefore, a method was devised where the statement is broken down into multiple segments so as to delve deeper into the constituent meaning of different phrases.

5.1.2.5 Deductions made From the Preliminary Analysis

At the beginning of this research, it was the intention of the researcher to explore all avenues of theoretical tacit knowing. However, it is becoming clear that due to the method of data collection, most forms of tacit knowing that can be identified exist post the social functioning on Dooyeweerd’s modal aspects range.

Interviews are a lingual form of research and thus most data collected seems to indicate a post-lingual functioning. Both psychic knowing and formative knowing are much more difficult to identify using interviews, but can be speculated due to foundational dependency as explained in section 3.3.1. Functioning in later aspects as presented by Dooyeweerd,

requires functioning in earlier aspects as well. Thus, functioning in post-lingual knowing requires functioning in earlier aspects such as psychic knowing and formative knowing.

Another major finding of the research, so far, is how influential the notion of shared background knowledge affects the research criteria. Although not conscious and of social functioning in nature, shared background knowledge in most instances does not indicate direct functioning in the social knowing criterion. What this indicates is that a person/organisation can have social tacit knowledge functioning at social knowing level, but also can have tacit knowledge about a situation/thing. As shown in the pilot study, this holds true for the main study.

In this research a new foundation for identifying tacit knowledge by utilising aspectual analysis has been introduced; as derived from Dooyeweerd's modal aspects. The aspectual analysis has been performed on interview data that has been collated in the form of perceptions of a workforce at a Manchester based organisation.

In this preliminary analysis, it has identified that due to the nature of interviews being lingual, most of the identifiable tacit knowing is post-lingual in nature. At this stage of the research the dissertation has explored the nature of tacit knowledge in terms of being both knowledge and tacit in nature; and suggested that there can be both tacit knowledge about an aspect and also aspectual tacit knowing.

5.2 Aspectual Analysis of Interviews

Following on from the failure of the preliminary analysis in generating useful data, the researcher then re-evaluated elements of the research, made it more structured and incorporated more properties of aspectual functioning. This was revealed to be extremely useful and thus this chapter will show the results of the newly formed analysis criteria.

As with before the chapter we will focus on the analysis of the interview transcripts for the purpose of attempting to identify tacit knowledge as defined by the different types covered in Chapter 3.1.2. As explained during the methodology chapter, the interviews are semi-structured in nature and thus the questions mostly follow are asked sequentially.

The format of the analysis will be: The interview named, the question and answer displayed. The specific phrase from the question to be analysed.

According to the initial framework devised in chapter 3.6, the following elements are to be observed:

1. Identification of different forms of tacit knowing adhering to the definitions set within the framework.
2. Following on from Dooyeweerd's theory of knowing asserting that there is no separation between the knower and the process of knowing, the interviewee itself becomes a potential source of data for identifying different forms of knowing.
3. Realising the separation between forms of tacit knowing identified within the interview itself and forms of knowing identified from the answers given by the interviewee to the questions devised by the researcher.

4. Noting the different properties of aspects such as dependency and inter-aspect reaching out in revealing the process of tacit knowing in both the interview itself and the interview questions and answers.

5. Exploring the levels of explication of the different forms of tacit knowing identified.

Once this has been determined then the analysis data is separated into three parts

i.) Making the statement: This is concerned with finding the forms of knowing in relation to the construction of the statement.

ii.) Statement Content: This looks at the forms of knowing behind the meaning of the statement. This is broken down further into three parts:

- The unspoken motivation behind making the statement. Note: Some statements might not have unspoken motivations.
- The spoken motivation mentioned implied while making the statement. Note: some statements may not have spoken motivations.
- Directly understood knowledge: statements that can be immediately understood. This may constitute commonalities in language that are readily used to either be understood linguistically in their present form or applied metaphorically.

iii.) Can it be explicated: This is a deeper examination of the statement to see which forms of tacit knowing can be explained and understood by the researcher and audience of research?

The analysis will consist of a number of tables that will examine each interview and the most data rich answers from each will be disseminated between the spoken and unspoken motivations of the employees, the tacit knowledge behind the content of a statement and whether it can be explicated. The tables are descriptive in what they are trying to show, and

through the use of aspectual functioning and aspectual knowing, the aspectual analysis can be conducted. The interviews with their respective aspectual analysis are shown as follows:

Interview (Iv01)

Question: “Now that you acquired these skills, how would you train someone else if they’re to do what you’re doing?”

Answer: “It would be a nightmare! I mean you just have to break it down. You can’t teach them to do everything all at once. You know, you’ve got to find what can we start with; what simple steps can you make to break them in...because before you even get started on thinking about pricing and all that stuff, you’ve got to think about the goods that you’re selling to customers, the suppliers, all these so many different things you have to think about. There’s actually, since they trained me, there’s been a little handbook made on how to train people on these jobs. That’s how hard it is.”

Phrase (P01): “It would be a nightmare!”

Making The Statement

Tacit Knowledge about statement: lingual tacit knowing about a lingual statement.

Tacit Knowledge behind the content: The phrase is an idiom. Thus, this exhibits social tacit knowing. A term that is collectively considered.

Statement Content

Unspoken Motivation: Asks for empathy and understanding from the interviewer. Thus, this shows a form of ethical tacit knowing on the part of both the interviewer and interviewee.

Spoken Motivation: The situation being a nightmare means that the research participant has negative functioning in the formative tacit knowing.

Directly Understood Knowledge: To relay the difficulty of the task.

Can It Be Explicated

First we have to determine what constitutes as “not being a nightmare” in this scenario for the research participant. Having determined it to be a nightmare, the interviewee has made a judgement on the situation. This indicates juridical knowing of the situation.

How can the situation not be a “nightmare”? This brings in the notion of harmony within the interviewee perception of the situation. The situation being a nightmare would indicate negative functioning in the aesthetic tacit knowing.

Addressing how to change the situation from its “nightmare” state would require gaining the skills necessary to train another person. It can be suggested that the skills may be acquired and perfected through experience. This indicates that we can be able to illuminate formative tacit knowing from the situation.

Interview (Iv01)

Question: “Now that you acquired these skills, how would you train someone else if they’re to do what you’re doing?”

Answer: “It would be a nightmare! I mean you have got to break it down. You can’t teach them to do everything all at once. You know, you’ve got to find what can we start with; what simple steps can you make to break them in...because before you even get started on thinking about pricing and all that stuff, you’ve got to think about the goods that you’re selling to customers, the suppliers, all these so many different things you have to think about. There’s actually, since they trained me, there’s been a little handbook made on how to train people on these jobs. That’s how hard it is”.

Phrase (P02): “I mean you just have to break it down”.

Making The Statement

Tacit Knowledge about statement: lingual tacit knowing about a formative statement.

Tacit Knowledge behind the content: “Break it down” implies knowing how to accomplish the task in a specific way. Thus indicating formative tacit knowing.

Statement Content

Unspoken Motivation: Judgement behind breaking the tasks. If the tasks are not broken down into manageable chunks then the training would not be possible/ would be performed in bad manner. Thus, that would be both detrimental to the trainer/ participant in this case and the company as a whole. Thus, this would indicate aesthetic tacit knowing on being

part of the whole company and juridical tacit knowing on the ability of training another person to do a job. Fulfilling one's obligation in teaching another person.

Spoken Motivation: Simplifying tasks: Thus indicating economic tacit knowing.

Directly Understood Knowledge: The need to make tasks manageable.

Can It Be Explicated

We can view the statement: "as opposed to not breaking down the tasks"? Thus the judgement behind breaking down the tasks can be used to illuminate juridical tacit knowing.

What if the tasks cannot be broken down? Then the participant must take the decision to proceed that will determine whether they function negatively or positively in the economic tacit knowing. This can be used to illuminate economic tacit knowing.

If the tasks need to be broken down then there needs to be a skill attached to performing the task: This illuminates formative tacit knowing.

Interview (Iv01)

Question: “Now that you acquired these skills, how would you train someone else if they’re to do what you’re doing?”

Answer: “It would be a nightmare! I mean you just have to break it down. You can’t teach them to do everything all at once. You know, you’ve got to find what can we start with; what simple steps can you make to break them in...because before you even get started on thinking about pricing and all that stuff, you’ve got to think about the goods that you’re selling to customers, the suppliers, all these so many different things you have to think about. There’s actually, since they trained me, there’s been a little handbook made on how to train people on these jobs. That’s how hard it is”.

Phrase (P03): “You can’t teach them to do everything at once”.

Making The Statement

Tacit Knowledge about statement: lingual tacit knowledge about a social statement.

Tacit Knowledge behind the content: Juridical [Appropriateness of statement in this context].

Statement Content

Unspoken Motivation: A judgement is relayed on the nature of time taken to teach another person to execute complex tasks. This indicates juridical tacit knowing on how to teach a person the correct way.

Spoken Motivation: The participant indicates economic tacit knowing on how to correctly manage the time given to train someone.

Directly Understood Knowledge: The complexity of the task relayed. Commonality of linguistics in this case.

Can It Be Explicated

We can ask the question: “What would happen if they were taught everything at once?” A judgement has to be made on whether or not to train people in segments with the belief that if it is done in segments then they can better understand what they are being taught. This illuminates juridical tacit knowing of the situation.

The management of resources that comes with making the judgement of how to teach/train new employees requires economic tacit knowing functioning which may either be negative or positive depending on how well the task is performed. This illuminates economic tacit knowing.

Interview (Iv01)

Question: “Now that you acquired these skills, how would you train someone else if they’re to do what you’re doing?”

Answer: “It would be a nightmare! I mean you just have to break it down. You can’t teach them to do everything all at once. You know, you’ve got to find what can we start with; what simple steps can you make to break them in because before you even get started on thinking about pricing and all that stuff, you’ve got to think about the goods that you’re selling to customers, the suppliers, all these so many different things you have to think about. There’s actually, since they trained me, there’s been a little handbook made on how to train people on these jobs. That’s how hard it is”.

Phrase (P04): “Break them in”.

Making The Statement

Tacit Knowledge about statement: lingual tacit knowing about a lingual statement.

Tacit Knowledge behind the content: Idiom -> indicates social tacit knowing.

Statement Content

Unspoken Motivation: The judgement on how to train the new employees indicates juridical tacit knowing. It may also indicate aesthetic tacit knowing as easing the employees into the new jobs enhances their ability to assimilate in the work population.

Spoken Motivation: Formative knowing on the process of how to train new employees.

Directly Understood Knowledge: Make them used to the situation through immersion into the complexities of the work they are doing at a gradual pace.

Can It Be Explicated

The judgement on whether or not to train employees in this manner brings into question the juridical nature of the situation and may be used to explicate juridical tacit knowing.

How to break them in also indicates an ability to train employees in a certain way and also the management of resources that is implied with the situation. This may illuminate both formative and economic tacit knowing. Formative on the method of “breaking them in”, and economic on the understanding of how to best manage the employees (if they were viewed as resources).

Interview (Iv01)

Question: “Now that you acquired these skills, how would you train someone else if they’re to do what you’re doing?”

Answer: “It would be a nightmare! I mean you just have to break it down. You can’t teach them to do everything all at once. You know, you’ve got to find what can we start with; what simple steps can you make to break them in because before you even get started on thinking about pricing and all that stuff, you’ve got to think about the goods that you’re selling to customers, the suppliers, all these so many different things you have to think about. There’s actually, since they trained me, there’s been a little handbook made on how to train people on these jobs. That’s how hard it is”.

Phrase (P05): “That’s how hard it is”.

Making The Statement

Tacit Knowledge about statement: lingual tacit knowing about a lingual statement.

Tacit Knowledge behind the content: Juridical [appropriateness of statement in setting].

Statement Content

Unspoken Motivation: The research participant is seeking empathy as well as understanding in this instance. This indicates ethical tacit knowing.

Spoken Motivation: The skills required to accomplish the task need to be of a certain level. Thus, indicating an element of formative tacit knowing.

Directly Understood Knowledge: Difficulty of task.

Can It Be Explicated

“What is considered hard in this scenario? How is the judgement of what is hard defined?”

This is an argument that can be used to illuminate juridical tacit knowing from the analysis of this statement.

There’s also the argument of: “how can it be made to not be difficult /what can be changed?” The task being summarised as hard elicits the researcher to indicate that the participant functions negatively in the formative tacit knowing. An implication may also be that due to inexperience of the situation the task is viewed as hard. This is an argument that can be explored in order to explicate formative tacit knowing.

Interview (Iv02)

Question: “When you think about the general satisfaction around the company or your general sense of satisfaction within the company, what are your thoughts on this?”

Answer: “It depends on who you ask. There were different people. I should explain that quite a few people who worked in the company were related or were already close to the boss. So there was always a feeling of tension; some people gained preferential treatment and some people were getting bonuses that other people should have got. Things like that. So when I came in, already there were a couple of people who felt stifled and thought that there were problems with the system of the company. Personally, I was okay. There were things that weren’t explained to me before the job started that would have made a difference to my decisions. I had to do a lot of very early shifts which wasn’t made clear from the start”.

Phrase (P01): “It depends on who you ask”.

Making The Statement

Tacit Knowledge about statement: lingual tacit knowledge about a social statement

Tacit Knowledge behind the content: Acknowledging collective knowledge of the situation thus indicating social tacit knowing.

Statement Content

Unspoken Motivation: To show that all parts of the company have to be explored. Acting as a whole instead of its parts. This indicates aesthetic tacit knowing.

Spoken Motivation: Utilising all employees (a company resource) to gain the whole picture. This may indicate economic tacit knowing.

Directly Understood Knowledge: Multiple perspectives of the workforce need to be considered.

Can It Be Explicated

“Why does it depend on who to be asked?” Why does it matter that multiple perspectives need to be examined?” The judgement behind the statement illuminates juridical tacit knowing. This understanding may also be used to illuminate aesthetic tacit knowing as

In terms of knowing how to utilise the knowledge contained by different employees in the company, this may be used to explicate economic tacit knowing, This is the effective use of the employees, considered to be a resource, in mapping company problems.

Interview (Iv02)

Question: “When you think about the general satisfaction around the company or your general sense of satisfaction within the company, what are your thoughts on this?”

Answer: “It depends on who you ask. There were different people. I should explain that quite a few people who worked in the company were related or were already close to the boss. So there was always a feeling of tension; some people gained preferential treatment and some people were getting bonuses that other people should have got. Things like that. So when I came in, already there were a couple of people who felt stifled and thought that there were problems with the system of the company. Personally, I was okay. There were things that weren’t explained to me before the job started that would have made a difference to my decisions. I had to do a lot of very early shifts which wasn’t made clear from the start”.

Phrase (P02): “Always a feeling of tension”.

Making The Statement

Tacit Knowledge about statement: lingual tacit knowledge about a lingual statement.

Tacit Knowledge behind the content: Juridical tacit knowing on appropriateness of statement in context.

Statement Content

Unspoken Motivation: Implications of bad cohesion through the company, thus indicating negative functioning of aesthetic tacit knowing.

Spoken Motivation: Indicative of negative functioning of social tacit knowing.

Directly Understood Knowledge: Present environment of conflict.

Can It Be Explicated

The cause behind the feeling of tension. If the cumulative knowledge of the firm (Social tacit functioning) is functioning in a negative way, then what's the judgement behind this?

What is described as a situation that doesn't cause a feeling of tension? Thus, in the first instance, we can illuminate juridical tacit knowing on the judgement behind the statement.

The implications of the judgement can then be examined to illuminate how the cumulative knowledge of the firm as a whole (operating in unison), has an effect on how work is conducted. This may present an argument through which social tacit knowing can be explicated.

Interview (Iv02)

Question: “When you think about the general satisfaction around the company or your general sense of satisfaction within the company, what are your thoughts on this?”

Answer: “It depends on who you ask. There were different people. I should explain that quite a few people who worked in the company were related or were already close to the boss. So there was always a feeling of tension; some people gained preferential treatment and some people were getting bonuses that other people should have got. Things like that. So when I came in, already there were a couple of people who felt stifled and thought that there were problems with the system of the company. Personally, I was okay. There were things that weren’t explained to me before the job started that would have made a difference to my decisions. I had to do a lot of very early shifts which wasn’t made clear from the start.”

Phrase (P03): “Problems with the system of the company”.

Making The Statement

Tacit Knowledge about statement: lingual tacit knowledge of a lingual statement.c

Tacit Knowledge behind the content: Formative tacit knowledge on a Juridical statement.

Statement Content

Unspoken Motivation: Implications of how the system was not working correctly affects the cohesion of the company, thus indicating aesthetic tacit knowing.

Spoken Motivation: formative tacit knowing of how the system functions.

Directly Understood Knowledge: failures within the system that hinder work.

Can It Be Explicated

The argument on what is viewed as a system with or without problems and the judgement behind the reasoning brings in different perspectives to be explored in the spectrum of knowing. In the case of juridical knowing, the judgement behind the rightness or wrongness of how the system works in relation to its effect on employees may be explored to illuminate juridical tacit knowing.

In the case of how the system utilises its resources, a system with problems may be one whose employees function negatively in the economic tacit knowing. This can be used to illuminate economic tacit knowledge. In the case of what knowledge is contained collectively by the company, problems with the system may indicate the company culture negatively affects the correct functioning of the company. This argument may be used to illuminate social tacit knowing. How does a system with problems affect the overall goal of the company? The targets and what each employee is driven to attain; the certainty contained in achieving the goals of a mission statement, this point of view may be used to investigate how pistic tacit knowing may be explored and explicated by showing how the negative or correct working of the system influences the beliefs of individuals or collectively, the beliefs instilled in the company.

Interview (Iv02)

Question: “When you think about the general satisfaction around the company or your general sense of satisfaction within the company, what are your thoughts on this?”

Answer: “It depends on who you ask. There were different people. I should explain that quite a few people who worked in the company were related or were already close to the boss. So there was always a feeling of tension; some people gained preferential treatment and some people were getting bonuses that other people should have got. Things like that. So when I came in, already there were a couple of people who felt stifled and thought that there were problems with the system of the company. Personally, I was okay. There were things that weren’t explained to me before the job started that would have made a difference to my decisions. I had to do a lot of very early shifts which wasn’t made clear from the start”.

Phrase (P04): “Personally, I was okay”.

Making The Statement

Tacit Knowledge about statement: lingual tacit knowledge about a juridical statement.

Tacit Knowledge behind the content: juridical tacit knowledge (Appropriateness of statement in context).

Statement Content

Unspoken Motivation: Explores empathy of situation. Addresses the problems and tries to draw the researcher away from feeling “sorry” for them. Also, the interviewee tries to empathise with the people involved in the system. This indicates ethical tacit knowing.

Spoken Motivation: Juridical tacit knowing of situation. Able to make a judgement on the relative nature of how other employees are treated compared to themselves.

Directly Understood Knowledge: Not affected by situation being described.

Can It Be Explicated

What is considered as okay or not okay in this instance? The first part of this argument may be used to explicate juridical tacit knowing. When asking how/why is the situation can be changed from one state to the other, then we have to examine the aesthetic functioning of the situation. When one employee considers themselves as being treated okay, then they must have come to the conclusion from the examination of the employees in the company. This argument may be used to explicate aesthetic tacit knowing.

Interview (Iv02)

Question: “When you think about the general satisfaction around the company or your general sense of satisfaction within the company, what are your thoughts on this?”

Answer: “It depends on who you ask. There were different people. I should explain that quite a few people who worked in the company were related or were already close to the boss. So there was always a feeling of tension; some people gained preferential treatment and some people were getting bonuses that other people should have got. Things like that. So when I came in, already there were a couple of people who felt stifled and thought that there were problems with the system of the company. Personally, I was okay. There were things that weren’t explained to me before the job started that would have made a difference to my decisions. I had to do a lot of very early shifts which wasn’t made clear from the start”.

Phrase (P05): “Made a difference to my decisions”.

Making The Statement

Tacit Knowledge about statement: lingual tacit knowledge about a juridical statement.

Tacit Knowledge behind the content: Juridical tacit knowledge of the appropriateness of statement. The participant expects the researcher to view this as a criticism on the basis of a shared understanding of what is appropriate.

Statement Content

Unspoken Motivation: how their working within the system allows them to better assimilate into the system and harmonise with the rest of the workforce. This may explore the notion of aesthetic tacit knowing.

Spoken Motivation: juridical tacit knowing of the situation.

Directly Understood Knowledge: The participant would have changed the way they interact within the company to better assimilate into the workforce.

Can It Be Explicated

The argument of what kind of situations would have to exist for the participant in order for them to make a difference to the decisions, presents an opportunity to study juridical tacit knowing of the situation (“on the rightness or wrongness of the situation”). While illuminating juridical tacit knowing through this argument, the notion of social tacit knowing can also be explored on how the participant adapts to the organisation’s cultural leanings so as to assimilate better into the workforce. The decisions the participants make would map a way into examining how knowledge is collectively held by the organisation through the study of its culture.

Interview (Iv02)

Question: “When you think about the general satisfaction around the company or your general sense of satisfaction within the company, what are your thoughts on this?”

Answer: “It depends on who you ask. There were different people. I should explain that quite a few people who worked in the company were related or were already close to the boss. So there was always a feeling of tension; some people gained preferential treatment and some people were getting bonuses that other people should have got. Things like that. So when I came in, already there were a couple of people who felt stifled and thought that there were problems with the system of the company. Personally, I was okay. There were things that weren’t explained to me before the job started that would have made a difference to my decisions. I had to do a lot of very early shifts which wasn’t made clear from the start”.

Phrase (P06): “Wasn’t made Clear from the start”.

Making The Statement

Tacit Knowledge about statement: lingual tacit knowledge about a lingual statement.

Tacit Knowledge behind the content: Wasn’t Made clear → Idiom → Indicates Social tacit knowing. (Although, not to be confused with “to make clear” which is analytic knowing which is explicit in nature).

Statement Content

Unspoken Motivation: Hoping for the interviewer to empathise with the situation. This indicates ethical tacit knowing.

Spoken Motivation: Juridical tacit knowing of the situation.

Directly Understood Knowledge: Situation was not explained well.

Can It Be Explicated

The argument of what is considered as being made clear or not brings in the notion of judgement of the situation. This can be used to illuminate juridical tacit knowing.

By examining how the scenario of the employee in the company in the instance when everything is made clear to them, then how they assimilate in the company may help the researcher examine aesthetic tacit knowing.

Interview (Iv03)

Question: “So when it comes to the overall mission statement that the company adheres to, do you think that there is anything that you had to follow that either limited or encouraged/complimented that notion?”

Answer: “Everything that you do is directed to that notion. It’s a very competitive market that Bettaveg is in and its dog eat dog. It’s a bloody battle between these companies and you’ve got to...if Bettaveg are to be successful, everybody working there needs to devote everything they have to it. The guidelines were not explicit. They were never formalised with me; I never saw them written down anywhere. It was all implicit and understood. But they were also obvious in a way. It’s what you would expect anywhere you work. It was never formalised in that way, it was informal”.

Phrase (P01): “Everything that you do is directed to that notion”.

Making The Statement

Tacit Knowledge about statement: lingual tacit knowledge about a pistic statement,

Tacit Knowledge behind the content: Everything that you do → Idiom → social tacit knowing.

Statement Content

Unspoken Motivation: Pistic tacit knowing about the certainty of what is to be accomplished. Statement also indicates that the interviewee views himself as being part of the whole company illuminating aesthetic tacit knowing.

Spoken Motivation: Formative tacit knowing of tasks to be accomplished

Directly Understood Knowledge: Overall goal for the company (explicated pistic knowledge).

Can It Be Explicated

What is considered “everything that you do” in this instance? How do the “things that you do not do” affect the end goal of the notion to be accomplished? How does the interviewee arrive to that judgement? This train of thought may be used to illuminate juridical tacit knowing of the statement. In the case of the tasks and resources needed to accomplish “the notion” in this instance, their consideration may be used to indicate areas of both economic and formative tacit knowing.

Interview (Iv03)

Question: “So when it comes to the overall mission statement that the company adheres to, do you think that there is anything that you had to follow that either limited or encouraged/complimented that notion?”

Answer: “Everything that you do is directed to that notion. It’s a very competitive market that Bettaveg is in and its dog eat dog. It’s a bloody battle between these companies and you’ve got to...if Bettaveg are to be successful, everybody working there needs to devote everything they have to it. The guidelines were not explicit. They were never formalised with me; I never saw them written down anywhere. It was all implicit and understood. But they were also obvious in a way. It’s what you would expect anywhere you work. It was never formalised in that way, it was informal”.

Phrase (P02): “Its dog eat dog”.

Making The Statement

Tacit Knowledge about statement: lingual tacit knowledge about a lingual statement.

Tacit Knowledge behind the content: Dog eat dog → Idiom → Social tacit knowing.

Statement Content

Unspoken Motivation: ethical knowing: Seeking empathy while utilising a social statement.

Spoken Motivation: Tries to illuminate juridical tacit knowing of the situation the company operates in.

Directly Understood Knowledge: An extremely competitive market.

Can It Be Explicated

What are the parameters in this field that the organisation works in that are considered “dog eat dog”? What is considered not to meet the criteria? This may be used to illuminate juridical tacit knowing of the situation.

Interview (Iv03)

Question: “So when it comes to the overall mission statement that the company adheres to, do you think that there is anything that you had to follow that either limited or encouraged/complimented that notion?”

Answer: “Everything that you do is directed to that notion. It’s a very competitive market that Bettaveg is in and its dog eat dog. It’s a bloody battle between these companies and you’ve got to...if Bettaveg are to be successful, everybody working there needs to devote everything they have to it. The guidelines were not explicit. They were never formalised with me; I never saw them written down anywhere. It was all implicit and understood. But they were also obvious in a way. It’s what you would expect anywhere you work. It was never formalised in that way, it was informal”.

Phrase (P03): “The guidelines were not explicit”.

Making The Statement

Tacit Knowledge about statement: lingual tacit knowing about a juridical statement.

Tacit Knowledge behind the content: juridical knowing of the situation.

Statement Content

Unspoken Motivation: Seeking empathy with the difficulty of the situation. Thus illuminating ethical tacit knowing. Also speaks to the nature of the company workings and may indicate negative functioning in the aesthetic tacit knowing.

Spoken Motivation: Presenting the scenario of what the employees have to overcome.

Thus illuminating juridical tacit knowing of the situation.

Directly Understood Knowledge: They did not have a manual for exactly what had to be done.

Can It Be Explicated

Is it a case of the guidelines being explicit and not useful or purely a case of the guidelines not being explicit? How does the interviewee come to this conclusion? What would present a scenario that reversed the conditions to better aid them? This line of thought may be used to illuminate juridical tacit knowing.

The how or what needs to be made explicit in the guidelines of the work to be accomplished can be examined to illuminate i.) the resources (employees) needed for certain kinds of work. Thus needing the company to utilise its resources in the correct manner. This can be used to illuminate economic tacit knowing. ii.) the types of skills that need to be described may explore the notion of illuminating formative tacit knowing.

(Simplification: The skills required to create the correct guidelines -> formative tacit knowing).

Interview (Iv04)

Question: “How would you describe the knowledge flow within the company in terms of procedures that you had to follow to the letter, or things that you had to employ by yourself, in order to be efficient with the skill base assigned?”

Answer: “Once I’d first been trained, I wasn’t doing it so well. So just the actual following the system didn’t really work. You had to acquire the knowledge... A lot of it was mathematical and very systematic; I hadn’t done a lot that stuff in a long time. I had to sharpen up on figuring out percentage increases and surcharges and all that sort of stuff that was never spelt out for me. I had to just pick up on it.

Training alone wasn’t enough to get you through. You had to piece it together yourself really. There were other people, whilst I was there, who were given the same training and didn’t get it and had to leave. They didn’t pick up the skills”.

Phrase (P01): “A lot of it was mathematical and very systematic”.

Making The Statement

Tacit Knowledge about statement: lingual tacit knowing about a formative statement.

Tacit Knowledge behind the content: formative tacit knowing of situation.

Statement Content

Unspoken Motivation: N/A ---Possibility (By saying it was mathematical and very systematic, are they telling the interviewer to understand the difficulty of the task? Most

people consider mathematics to be difficult...thus, they would be seeking empathy of the situation. Possibility that ethical tacit knowing is being illuminated).

Spoken Motivation: formative tacit knowing of the situation.

Directly Understood Knowledge: involved defined mathematical parameters and worked in a specific manner.

Can It Be Explicated

Why is the situation considered “mathematical and very systematic”? What would encompass a situation that would not fit this parameter? Thus, the juridical tacit knowing of reaching this conclusion may be explicated when pursuing this line of thought.

What skills are needed to accomplish the tasks or situation given? Does the experience of a person decrease the difficulty of the tasks? This may be used to illuminate formative tacit knowing.

Interview (Iv04)

Question: “How would you describe the knowledge flow within the company, in terms of procedures that you had to follow to the letter or things that you had to employ by yourself in order to be efficient with the skill base assigned?”

Answer: “Once I’d first been trained, I wasn’t doing it so well. So just the actual following the system didn’t really work. You had to acquire the knowledge...A lot of it was mathematical and very systematic; I hadn’t done a lot that stuff in a long time. I had to sharpen up on figuring out percentage increases and surcharges and all that sort of stuff that was never spelt out for me. I had to just pick up on it.

Training alone wasn’t enough to get you through. You had to piece it together yourself really. There were other people, whilst I was there, who were given the same training and didn’t get it and had to leave. They didn’t pick up the skills”.

Phrase (P02): “I had to sharpen up”.

Making The Statement

Tacit Knowledge about statement: lingual tacit knowing about a lingual statement.

Tacit Knowledge behind the content: Sharpen up -> Idiom → Social tacit knowing.

Statement Content

Unspoken Motivation: aesthetic tacit knowing....being part of the whole. Not wanting to lag behind/let down the rest of the colleagues. Assimilating better into the role.

Spoken Motivation: Formative tacit knowing of the skills required.

Directly Understood Knowledge: Re-learn the tasks again.

Can It Be Explicated

The decision to “sharpen up” is made on the judgement of whether they possess the necessary skills to accomplish the tasks given. To not “sharpen up” would ultimately lead to their situation being compromised in the company. Thus, we can first illuminate the juridical tacit knowing of the situation, which helps to also illuminate the aesthetic tacit knowing of the situation.

If we examine what is needed to be “sharpened up”/ how to achieve it, then we can be able to illuminate facets of formative tacit knowing.

Interview (Iv04)

Question: “How would you describe the knowledge flow within the company, in terms of procedures that you had to follow to the letter or things that you had to employ by yourself in order to be efficient with the skill base assigned?”

Answer: “Once I’d first been trained, I wasn’t doing it so well. So just the actual following the system didn’t really work. You had to acquire the knowledge...A lot of it was mathematical and very systematic; I hadn’t done a lot that stuff in a long time. I had to sharpen up on figuring out percentage increases and surcharges and all that sort of stuff that was never spelt out for me. I had to just pick up on it.

Training alone wasn’t enough to get you through. You had to piece it together yourself really. There were other people, whilst I was there, who were given the same training and didn’t get it and had to leave. They didn’t pick up the skills”.

Phrase (P03): “Training alone wasn’t enough to get you through”.

Making The Statement

Tacit Knowledge about statement: lingual tacit knowing about a juridical statement.

Tacit Knowledge behind the content: Juridical tacit knowing about a formative statement.

Statement Content

Unspoken Motivation: Looking for empathy of the situation from the interviewer; thus may illuminate ethical tacit knowing.

Spoken Motivation: juridical tacit knowing of the situation. What does the interviewer think of a training process that is inadequate?

Directly Understood Knowledge: You needed more skills than those taught through training.

Can It Be Explicated

What is considered enough to get you through? Why is the training considered not enough? These questions may be asked when illuminating juridical tacit knowing.

How/what can be done to make the training enough? Examining the skill required to train the employees correctly may illuminate formative tacit knowing. In addition, the examination of the utilisation of resources required to train people effectively may illuminate economic tacit knowing.

Interview (Iv04)

Question: “How would you describe the knowledge flow within the company, in terms of procedures that you had to follow to the letter or things that you had to employ by yourself in order to be efficient with the skill base assigned?”

Answer: “Once I’d first been trained, I wasn’t doing it so well. So just the actual following the system didn’t really work. You had to acquire the knowledge...A lot of it was mathematical and very systematic; I hadn’t done a lot that stuff in a long time. I had to sharpen up on figuring out percentage increases and surcharges and all that sort of stuff that was never spelt out for me. I had to just pick up on it.

Training alone wasn’t enough to get you through. You had to piece it together yourself really. There were other people, whilst I was there, who were given the same training and didn’t get it and had to leave. They didn’t pick up the skills”.

Phrase (P04): “Piece it together”.

Making The Statement

Tacit Knowledge about statement: lingual tacit knowing about a lingual statement.

Tacit Knowledge behind the content: piece it together → idiom → Social tacit knowing.

Statement Content

Unspoken Motivation: Seeking empathy. The interviewee wants the researcher to understand the difficulties that the situation presents. The need to piece it together

indicates that the company may function negatively in the aesthetic aspect due to the lack of cohesion of the company understanding its employees' needs.

Spoken Motivation: Juridical tacit knowing of a formative situation.

Directly Understood Knowledge: Use own understanding to accomplish task and assimilate better into the situation presented.

Can It Be Explicated

What is considered as a situation that needs to be pieced together? And what is considered as not needing to be pieced together in the context of this situation? What conditions satisfy each of these conditions? Reaching an answer to this line of thought requires judgement to be made on the situation at hand. This indicates that we are able to illuminate juridical tacit knowing by following this thought progression.

How/what is involved in piecing together information to accomplish the assigned tasks? A certain level of skill or experience is required to accomplish the tasks assigned without being given better training on the tasks to be accomplished. This line of thought may be used to illuminate formative tacit knowing.

Interview (Iv04)

Question: “How would you describe the knowledge flow within the company, in terms of procedures that you had to follow to the letter or things that you had to employ by yourself in order to be efficient with the skill base assigned?”

Answer: “Once I’d first been trained, I wasn’t doing it so well. So just the actual following the system didn’t really work. You had to acquire the knowledge...A lot of it was mathematical and very systematic; I hadn’t done a lot that stuff in a long time. I had to sharpen up on figuring out percentage increases and surcharges and all that sort of stuff that was never spelt out for me. I had to just pick up on it.

Training alone wasn’t enough to get you through. You had to piece it together yourself really. There were other people whilst I was there, who were given the same training and didn’t get it and had to leave. They didn’t pick up the skills”.

Phrase (P05): “They didn’t pick up the skills”.

Making The Statement

Tacit Knowledge about statement: lingual tacit knowledge about a lingual statement.

Tacit Knowledge behind the content: juridical tacit knowing on situation.

Statement Content

Unspoken Motivation: There is an element of empathy expressed by the interviewee towards those that didn’t pick up the skills and were eventually let go. This indicates ethical tacit knowing by the interviewee concerning the situation. Additionally, in an environment where certain people are discarded due to possibly the shortcomings of the

training, one can conclude that there is a lack of harmony between the trainees and the trainers. A lack of harmony indicates functioning negatively in the aesthetic tacit knowing. Spoken Motivation: Portray the difficulty of acquiring the skills required and to possibly outline the shortcomings of the training. To make this judgement indicates juridical tacit knowing of a formative situation.

Directly Understood Knowledge: Not proficient at executing the given tasks.

Can It Be Explicated

What would comprise of the skills being picked up? Also, what constitutes as not picking up the skills? This argument would help in illuminating juridical tacit knowing.

Additionally, the determination that they did not pick up the skills requires an understanding of the skills that they did not pick up. This indicates a level of formative tacit knowing which can be illuminated from this line of thought.

Interview (Iv05)

Question: “Do you feel that the company has an ethical standing towards the market/environment it exists in?”

Answer: “Yes, the company took a lot of time to figure that out really I think. I mentioned that there are a lot of companies in that area and it’s a fight between them all. And some of the other ones quite frankly are ripping their customers off, charging them unfair prices because the customers don’t realise that they can get this stuff at a better price. So Bettaveg, yeah you know, it’s honest, it’s providing a service that people want and need. I should maybe explain that what the company did is that they delivered products to a multitude of organisations from schools to hospitals, to all these different places and they took every effort to make sure that they were doing it right. There was a lot of ecological policies being enacted, ethically they were pretty sound I must say”.

Phrase (P01): “Took a lot of time to figure that out”.

Making The Statement

Tacit Knowledge about statement: lingual tacit knowledge about a lingual statement.

Tacit Knowledge behind the content: juridical tacit knowing of situation.

Statement Content

Unspoken Motivation: Might indicate a failure in the collective knowledge of the company thus indicating negative social tacit knowing.

Spoken Motivation: juridical tacit knowing about the nature of the situation and the impact it may have.

Directly Understood Knowledge: An extended period of time to come to terms with situation.

Can It Be Explicated

What would be the parameters for considering whether the company took a lot of time or not to figure out their ethical standing in their market area? This requires a level of judgement of the situation which illuminates an argument that can be used to explicate juridical tacit knowing.

Why or how did it take a long time to figure out their positioning? This line of thought may be used to examine the company's culture or collective knowledge utilisation that may illuminate social tacit knowing of the organisation. //“Does the pistic tacit knowing in this instance function negatively as the company has not yet established a firm belief or placed certainty on its purpose of existence?”//

Interview (Iv05)

Question: “Do you feel that the company has an ethical standing towards the market/environment it exists in?”

Answer: “Yes, the company took a lot of time to figure that out really I think. I mentioned that there are a lot of companies in that area and it’s a fight between them all. And some of the other ones quite frankly are ripping their customers off, charging them unfair prices because the customers don’t realise that they can get this stuff at a better price. So Bettaveg, yeah you know, it’s honest, it’s providing a service that people want and need. I should maybe explain that what the company did is that they delivered products to a multitude of organisations from schools to hospitals, to all these different places and they took every effort to make sure that they were doing it right. There was a lot of ecological policies being enacted, ethically they were pretty sound I must say”.

Phrase (P02): “ripping their customers off”.

Making The Statement

Tacit Knowledge about statement: lingual tacit knowledge about a lingual statement.

Tacit Knowledge behind the content: “ripping off” → Idiom -→ Social tacit knowing.

Statement Content

Unspoken Motivation: Interviewee empathises with the customers showing ethical tacit knowing.

Spoken Motivation: Making a judgement on the situation showing juridical tacit knowing.

Directly Understood Knowledge: The customers are being cheated.

Can It Be Explicated

What is considered ripping off and what is considered not ripping off in the context of the statement? One has to make a judgement on the situation, and this may be used to illuminate juridical tacit knowing.

Interview (Iv05)

Question: “Do you feel that the company has an ethical standing towards the market/environment it exists in?”

Answer: “Yes, the company took a lot of time to figure that out really I think. I mentioned that there are a lot of companies in that area and it’s a fight between them all. And some of the other ones quite frankly are ripping their customers off, charging them unfair prices because the customers don’t realise that they can get this stuff at a better price. So Bettaveg, yeah you know, it’s honest, it’s providing a service that people want and need. I should maybe explain that what the company did is that they delivered products to a multitude of organisations from schools to hospitals, to all these different places and they took every effort to make sure that they were doing it right. There was a lot of ecological policies being enacted, ethically they were pretty sound I must say”.

Phrase (P03): “it’s honest”.

Making The Statement

Tacit Knowledge about statement: lingual tacit knowing of a lingual statement.

Tacit Knowledge behind the content: juridical tacit knowledge of situation.

Statement Content

Unspoken Motivation: A belief that what they do is right. This may present pistic tacit knowing.

Spoken Motivation: Positive functioning of aesthetic aspect of juridical tacit knowing of a situation.

Directly Understood Knowledge: Conducts business in an ethical manner.

Can It Be Explicated

What is considered honest or not honest? Making this judgement illuminates juridical tacit knowing.

How/What makes it honest? Utilising the resources in a way that allows the company to sell to the consumers at a good rate while still making the company profitable. This line of thought may be used to illuminate economic tacit knowing. The skill behind being able to accomplish these conditions may also be explored to illuminate formative tacit knowing.

Interview (Iv05)

Question: “Do you feel that the company has an ethical standing towards the market/environment it exists in?”

Answer: “Yes, the company took a lot of time to figure that out really I think. I mentioned that there are a lot of companies in that area and it’s a fight between them all. And some of the other ones quite frankly are ripping their customers off, charging them unfair prices because the customers don’t realise that they can get this stuff at a better price. So Bettaveg, yeah you know, it’s honest, it’s providing a service that people want and need. I should maybe explain that what the company did is that they delivered products to a multitude of organisations from schools to hospitals, to all these different places and they took every effort to make sure that they were doing it right. There was a lot of ecological policies being enacted, ethically they were pretty sound I must say”.

Phrase (P04): “Took every effort”.

Making The Statement

Tacit Knowledge about statement: lingual tacit knowledge about a lingual statement.

Tacit Knowledge behind the content: Appropriateness of statement →Juridical tacit knowing.

Statement Content

Unspoken Motivation: Interviewee wants the interviewer to empathise with the situation by emphasising the dedication of the company. This shows ethical tacit knowing. Taking

every effort requires every element of the whole to work harmoniously and consider themselves part of the whole. This may indicate aesthetic tacit knowing.

Spoken Motivation: juridical tacit knowing of the situation in assessing whether what they were doing was right. This could also apply to the utilisation of resources and this would indicate economic tacit knowing.

Directly Understood Knowledge: Did the best they could to achieve objectives.

Can It Be Explicated

What is considered as taking every effort and what is considered as the threshold of not taking every effort? Exploring this argument, shows that a judgement has to be made before making such a statement and this illustrates juridical tacit knowing.

What is “taking every effort”? / How do you “take every effort”? By exploring this line of questioning, we can assess how the company utilised its resources in order to accomplish the tasks. This would illuminate economic tacit knowing.

Interview (Iv05)

Question: “Do you feel that the company has an ethical standing towards the market/environment it exists in?”

Answer: “Yes, the company took a lot of time to figure that out really I think. I mentioned that there are a lot of companies in that area and it’s a fight between them all. And some of the other ones quite frankly are ripping their customers off, charging them unfair prices because the customers don’t realise that they can get this stuff at a better price. So Bettaveg, yeah you know, it’s honest, it’s providing a service that people want and need. I should maybe explain that what the company did is that they delivered products to a multitude of organisations from schools to hospitals, to all these different places and they took every effort to make sure that they were doing it right. There was a lot of ecological policies being enacted, ethically they were pretty sound I must say”.

Phrase (P05): “Ethically they were pretty sound I must say”.

Making The Statement

Tacit Knowledge about statement: lingual tacit knowledge about a lingual statement.

Tacit Knowledge behind the content: “pretty sound” → Idiom → Social tacit knowing.

Statement Content

Unspoken Motivation: There is an element of the interviewee’s demeanour in the pride they feel for the company’s ethical standing...and they want that to come across and be positively received by the researcher. This indicates ethical tacit knowing as they want the researcher to empathise with their pride for their company’s ethical stance.

Spoken Motivation: This is a judgement on the situation and would elicit juridical tacit knowing. It may also indicate that the knowledge collectively held in the company about consumer relations to be of a certain disposition indicating social tacit knowing.

Directly Understood Knowledge: Ethically speaking, they were good.

Can It Be Explicated

What is considered as being ethically pretty sound and what is not? To make this decision a judgement has to be made and this line of thought may be used to illuminate juridical tacit knowing.

How is being “ethically pretty sound” achieved? This may explore how the resources are utilised of the company are utilised and this may be used to illuminate economic tacit knowing.

Interview (Iv06)

Question: “Is there anything that you feel is important that I’ve not asked you about the company or your own positioning within the company?”

Answer: “Oh my, that’s a red rag to a bull! It’s a very small company like I keep saying. So a lot of the problems it has would be solvable if there were more people working there. Do you know what I mean? If there were a hundred people working there, they could iron out a lot of the problems since everything would be more formalised, it would be more scripted. Because it is still small and growing, it’s only been going for ten years or so maybe less. They are still figuring out what to do, they are still figuring out how to bring people in and incorporate and assimilate people into the Bettaveg world. Its growing pains”.

Phrase (P01): “red rag to a bull!”

Making The Statement

Tacit Knowledge about statement: lingual tacit knowing about a lingual statement.

Tacit Knowledge behind the content: “red rag to a bull” → idiom → Social tacit knowing.

Statement Content

Unspoken Motivation: A humorous way to indicate that there may be grievances that are suffered by employees in most companies. The interviewee wants to engage with the researcher in a way that the researcher is empathetic to their plight. This may indicate ethical tacit knowing.

Spoken Motivation: A judgement on some of the elements of the company indicating juridical tacit knowing of the situation.

Directly Understood Knowledge: There may be some grievances about parts of the company for the interviewee.

Can It Be Explicated

The appropriateness of the statement in context to what is being asked may be used to illuminate juridical tacit knowing of the situation. What is considered “a red rag to a bull” and what is not in this instance? This means that the interviewee had to make a judgement on the situation so as to have a stance on the issue being evoked. This further emphasises juridical tacit knowing.

Interview (Iv06)

Question: “Is there anything that you feel is important that I’ve not asked you about the company or your own positioning within the company?”

Answer: “Oh my, that’s a red rag to a bull! It’s a very small company like I keep saying. So a lot of the problems it has would be solvable if there were more people working there. Do you know what I mean? If there were a hundred people working there, they could iron out a lot of the problems since everything would be more formalised, it would be more scripted. Because it is still small and growing, it’s only been going for ten years or so maybe less. They are still figuring out what to do, they are still figuring out how to bring people in and incorporate and assimilate people into the Bettaveg world. It’s growing pains”.

Phrase (P02): “It’s growing pains”.

Making The Statement

Tacit Knowledge about statement: lingual tacit knowing about a lingual statement.

Tacit Knowledge behind the content: growing pains → Idiom → Social tacit knowing.

Statement Content

Unspoken Motivation: The interviewee wants the researcher to empathise with the situation. This indicates ethical tacit knowing. In addition the way some of these inadequacies affect the harmony within the company may indicate aesthetic tacit knowing of the situation.

Spoken Motivation: Juridical tacit knowing of the situation relative to what the effects of its expanding state has on everything. May also refer to how the resources of the company are being utilised especially in a situation where there may not be enough to accomplish certain tasks indicating economic tacit knowing.

Directly Understood Knowledge: Problems associated with the company getting larger.

Can It Be Explicated

In this context, what is considered “growing pains” and what is not? Making a judgement as to whether the situation lies one way or the other may illuminate juridical tacit knowing.

Considering the situation as growing pains places some emphasis on the strain on resources and how that affects the company. How effectively these resources are managed may be explored to illuminate economic tacit knowing. In addition the processes within the company and its culture brought about by its growing size may be used to explore what knowledge the company collectively holds at different periods of growth. As the company grows, its knowledge base/culture changes. This line of thought may be used to illuminate social tacit knowing.

5.3 2nd Stage of Analysis: Aspectual Analysis Sorting

In order to gauge the pattern of occurrence for each form of tacit knowing element, the researcher has created visual representations of how each form of knowing lies on the modular aspects range.

In the context of the initial theoretical framework, it is important to show the results of the analysis relative to the suggestions within the framework. This can be surmised as:

I.) Presentation of different forms of tacit knowing. Showing that as defined by figure 3 of the dissertation, the different forms of tacit knowing can be accounted for within the process.

II.) Showing that within the theory of knowing, the interview process itself becomes a rich source of data for identifying tacit knowing in process.

III.) Showing how the illumination of different forms of tacit knowing is affected by inter-aspect reaching out for the different sections of the analysis.

IV.) Showing that different forms of tacit knowing can be explicated, and that some forms tacit knowing are explicated more than others within the criteria utilised in this dissertation.

This does not suggest how difficult one form of tacit knowing is in explicating relative to others, but can be a starting point for another full analysis of why certain types of tacit knowing are explicated more readily than others within an analysis utilising interview data.

A sort parameter has to be designed to display how the different forms of knowing have been reviewed. The abbreviations used for the 2nd stage of the analysis are as follows:

Figure 10: Abbreviations used in Analysis Data Sorting

Term	Abbreviation
Phrase	P0 ---add number to link to phrase
Interview	Iv --- due to sorting issues removed to begin with 00 thus: Iv01 becomes 01
Interview + Phrase: This forms the identifier.	Example: Interview 01, Phrase P01 Becomes: 01P01

For each of the categories defined in the first stage of the analysis an aspectual grid has been created to show the tacit knowledge type occurrence and subsequent dispersion throughout the interviews.

Spoken Motivations

Figure 11: Spoken Motivations Data

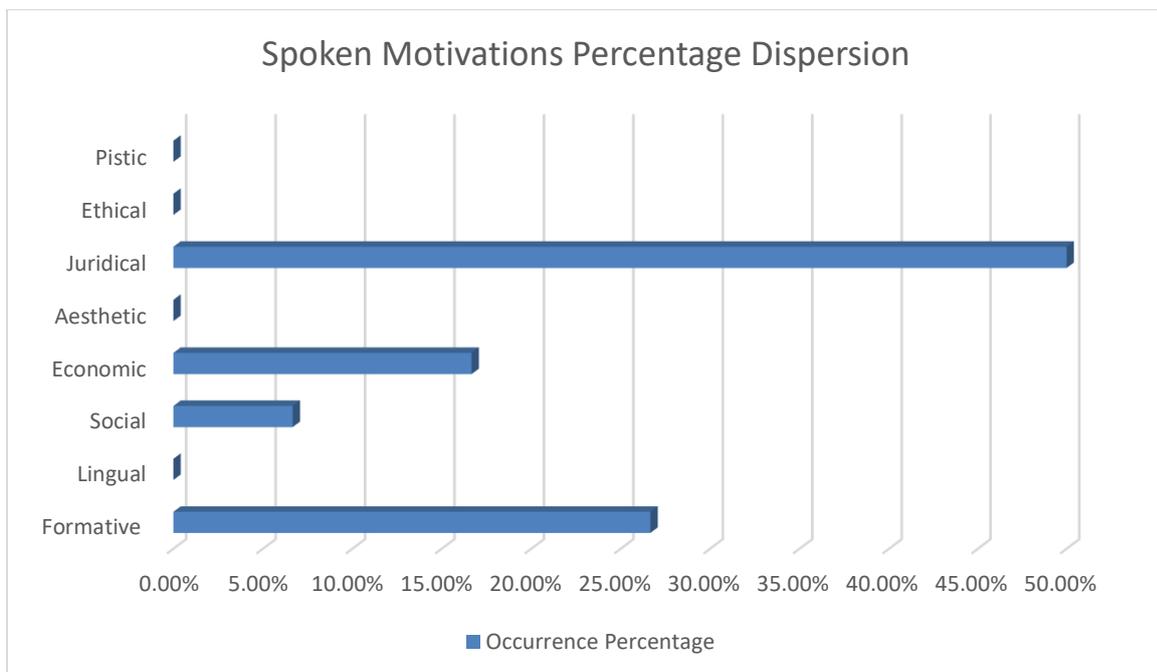
Type of Tacit Knowing	Interview + Phrase (Identifier)
Formative to Pistic Only	
Formative	01P01, 01P04, 01P05, 02P03, 03P01, 04P01, 04P02, 04P05
Lingual	
Social	02P02, 05P05
Economic	01P02, 01P03, 02P01, 05P04, 06P02
Aesthetic	
Juridical	02P04, 02P05, 02P06, 03P02, 03P03, 04P03, 04P04, 04P05, 05P01, 05P02, 05P03, 05P04, 05P05, 06P01, 06P02
Ethical	
Pistic	

Percentage - Count Comparison for Spoken Motivation

Type of Tacit Knowing	Occurrences	Percentage
Formative to Pistic Only		
Formative	8	26.67%
Lingual	0	-
Social	2	6.67%
Economic	5	16.67%
Aesthetic	0	-
Juridical	15	50%
Ethical	0	-
Pistic	0	

Bar Chart representing the percentage dispersion for Spoken Motivations

Figure 12: Bar Chart of Spoken Motivations



Spoken Motivations

Most forms of tacit knowing identified in spoken motivations are juridical, economic and formative with juridical tacit knowing being the most abundant with a 50% stake of occurrence. There is also a small percentage of just over 6% relating to social tacit knowing.

When analysing the results the researcher has come up with the following conclusions:

In terms of the abundance of juridical knowing in spoken motivations, the research participants give their views rightness or wrongness of a situation.

In terms of economic knowing, to be part of an SME is to be fully aware of the limitations or strain of resources that the company faces. This will be an issue that has been stressed to all employees in the company throughout their tenure with the company. Thus, it would be just to make the conclusion that due to the nature of importance that the firm, as do most SMEs, places on the effective management of resources, then the research participants would have this information as almost second nature to them and would reveal it in their answers to the researcher.

In terms of social knowing, being part of the culture of an SME elicits a certain way of viewing the world relative to the company's place in it.

Unspoken Motivations

Figure 13: Unspoken Motivations Data

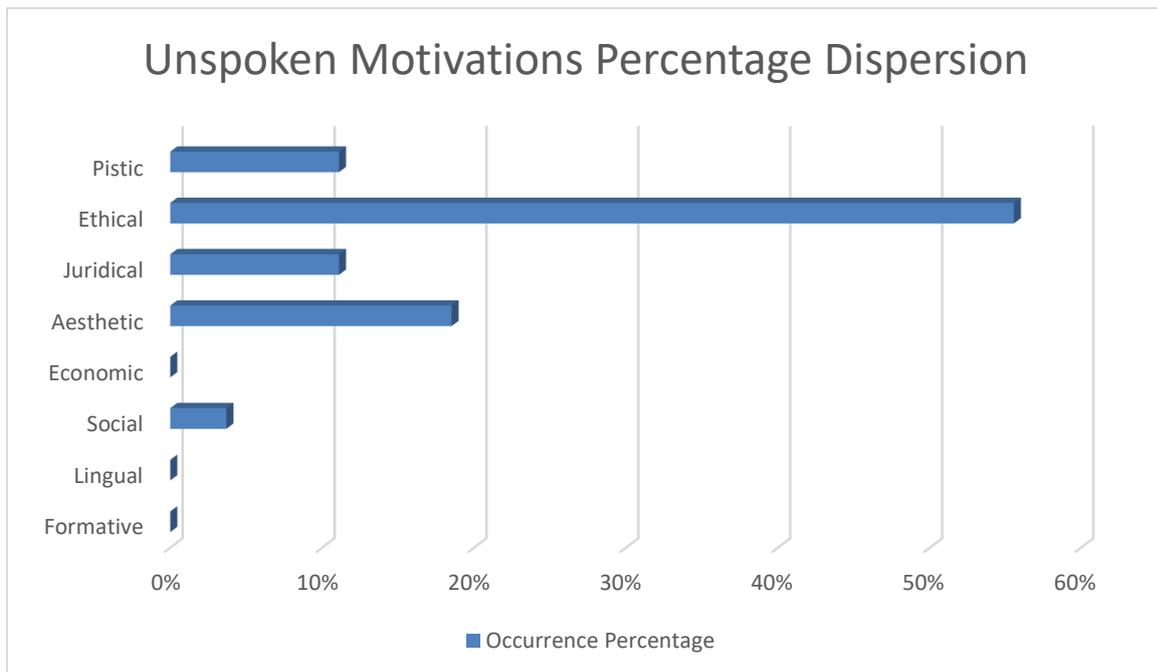
Type of Tacit Knowing	Interview + Phrase (Identifier)
Formative to Pistic Only	
Formative	
Lingual	
Social	05P01
Economic	
Aesthetic	01P02, 01P04, 02P01, 02P02, 02P03
Juridical	01P02, 01P03, 01P04
Ethical	01P01, 01P05, 02P04, 02P06, 03P02, 03P03, 04P01, 04P03, 04P04, 04P05, 05P02, 05P04, 05P05, 06P01, 06P02
Pistic	03P01, 05P03, 05P04

Percentage - Count Comparison for Unspoken Motivation

Type of Tacit Knowing	Occurrences	Percentage
Formative to Pistic Only		
Formative	0	-
Lingual	0	-
Social	1	3.70%
Economic	0	-
Aesthetic	5	18.52%
Juridical	3	11.11%
Ethical	15	55.56%
Pistic	3	11.11%

Bar Chart representing the percentage dispersion for Unspoken Motivations

Figure 14: Barchart of Unspoken Motivations



Unspoken Motivations

Ethical tacit knowing accounts for the most abundant form of tacit knowing observed while reviewing unspoken motivations. In this section, it is also important to note that there are no formative, lingual or economic forms of tacit knowing discovered while dealing with unspoken motivations.

Aesthetic knowing: The appropriateness of the statement being spoken may be tied to societal norms and how one is meant to address another in a formal setting.

Juridical knowing: The complexity of what is right or wrong, given the perspective of the interviewee, whether they are management or ground floor workers, is a recurring issue that will always be prescient within the unspoken motivations of a workforce.

It should be noted that there is no lingual or economic tacit knowing identified in the unspoken motivations of the employees. On the lingual tacit knowing, it can be speculated that almost no one has an unspoken motivation that resides in being able to disseminate the lingual functioning of human beings. (Linguists or professions which involve an element of deciphering linguistics might exhibit this, but normal employees of a business organisation would not harbour such unspoken motivations. The interesting element here is that there doesn't seem to be an economic tacit knowing exhibited in unspoken motivations. Unspoken motivations might relate to the hopes and dreams of people and, in those scenarios, there is usually an abundance of whatever element is being sought. This is the researcher's interpretation and an element that presents a gateway towards philosophical discussions of self-worth that the researcher hopes to accomplish in further research.

Can it Be Explicated

Figure 15: "Can it Be Explicated" Data

Type of Tacit Knowing	Interview + Phrase (Identifier)
Formative to Pistic Only	
Formative	01P01, 01P02, 01P04, 01P05, 03P01, 03P03, 04P01, 04P02, 04P03, 04P04, 04P05, 05P03
Lingual	
Social	02P02, 02P03, 02P05, 05P01, 06P02
Economic	01P02, 01P03, 01P04, 02P01, 02P03, 03P01, 03P03, 04P03, 05P03, 05P04, 05P05, 06P02
Aesthetic	01P01, 02P01, 02P04, 02P06, 04P02
Juridical	01P01, 01P02, 01P03, 01P04, 01P05, 02P01, 02P02, 02P03, 02P04, 02P05, 02P06, 03P01, 03P02, 03P03, 04P01, 04P02, 04P03, 04P04, 04P05, 05P01, 05P02, 05P03, 05P04, 05P05, 06P01, 06P02
Ethical	

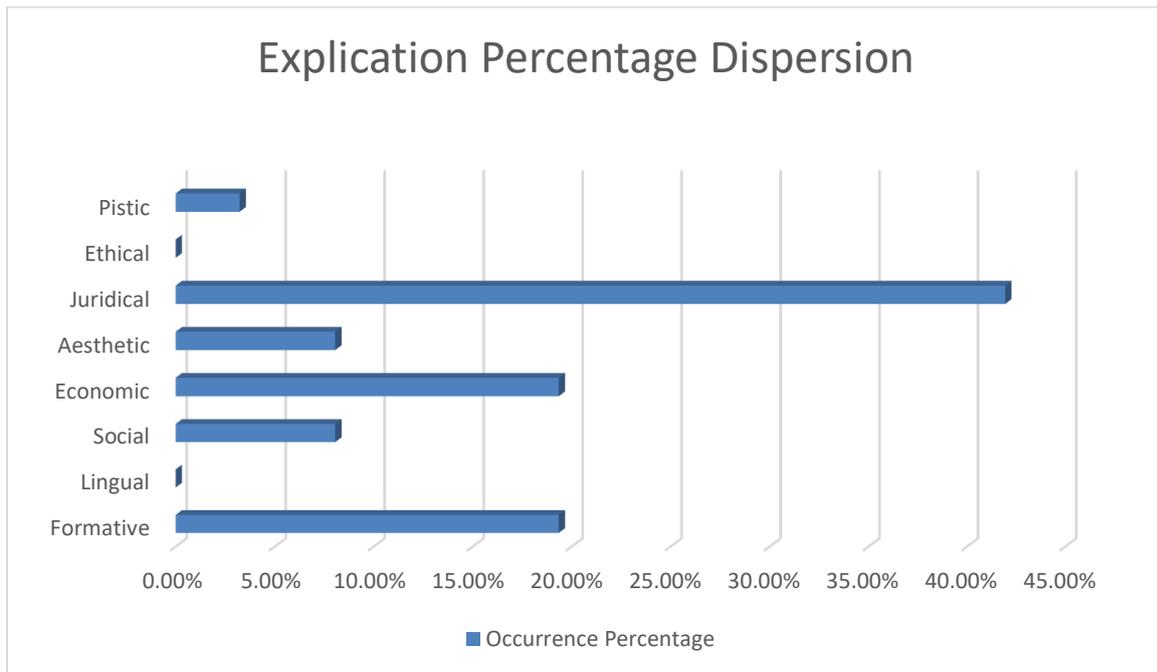
Pistic	02P03, 05P01
--------	--------------

Percentage - Count Comparison for Unspoken Motivation

Type of Tacit Knowing	Occurrences	Percentage
Formative to Pistic Only		
Formative	12	19.35%
Lingual	0	-
Social	5	8.06%
Economic	12	19.35%
Aesthetic	5	8.06%
Juridical	26	41.94%
Ethical	0	-
Pistic	2	3.23%

Bar Chart representing the percentage dispersion for Explication (“Can it be explicated?”)

Figure 16: Bar Chart of "Can it Be Explicated"



In the explication tables we note that there is a huge percentage of what can be explicated reliant upon the juridical tacit knowing involved in disseminating the content of the statements. The researcher speculates that this is because juridical aspect involves the laws of that govern things and, as such, the law governing a specific aspect would be reliant upon the juridical aspect of its conception.

For example: If we are viewing the formative aspectual functioning, through inter-aspect reaching-out, we know that the formative aspect has the whole spectrum of the aspects as laws of itself as shown in figure 2 of the dissertation.

Formative: This ranges from the Quantitative law to the Pistic law of formative functioning, The whole spectrum of fifteen aspects is represented, but in this case they function as laws that govern the functioning of this one aspect.

This is similar to formative knowing, and we may have different aspects of formative knowing.

However, since the juridical aspect itself is a dissemination of law, then it is speculative to assume that the judgement of whether or not we can explicate a thing is dependent on us having juridical tacit knowing of the thing.

It is also notable that the lingual tacit knowing and ethical tacit knowing were not forms of tacit knowing that could be explicated.

In terms of the lingual tacit knowing, the speculation that can be made is that as we were designating the different properties of the different forms of knowing in Chapter 3, we had noted that the lingual tacit knowing has both explicit and tacit properties associated with it. Together with the analytic tacit knowing, they were the exceptions in that in the spectrum of tacit knowing as designated by the theory of knowing, they are the only forms of tacit knowing with an explicit element to them. Thus, it can be determined that this is a confirmation of one of the elements theorised in the theoretical framework.

The researcher further speculates that ethical tacit knowing might be too dependent on psychic tacit knowing to be explicated. We can be able to determine ethical tacit knowing, but it might require a different data collection method to be able to explicate it.

This section has illustrated how different forms of tacit knowing were explicated within the aspectual analysis. The rate of occurrence of different forms was to show the reader how the explication differed for different forms of tacit knowing. However, the rate of occurrence does not alter the method of explicating a form of tacit knowing. It provides a way for speculation on how an organisation's workforce reacts in this particular interview setting, but does not set limits or conclusions on the explicability of different forms of tacit knowing.

Tacit Knowledge About the Statement

Figure 17: Tacit Knowledge About the Statement Data

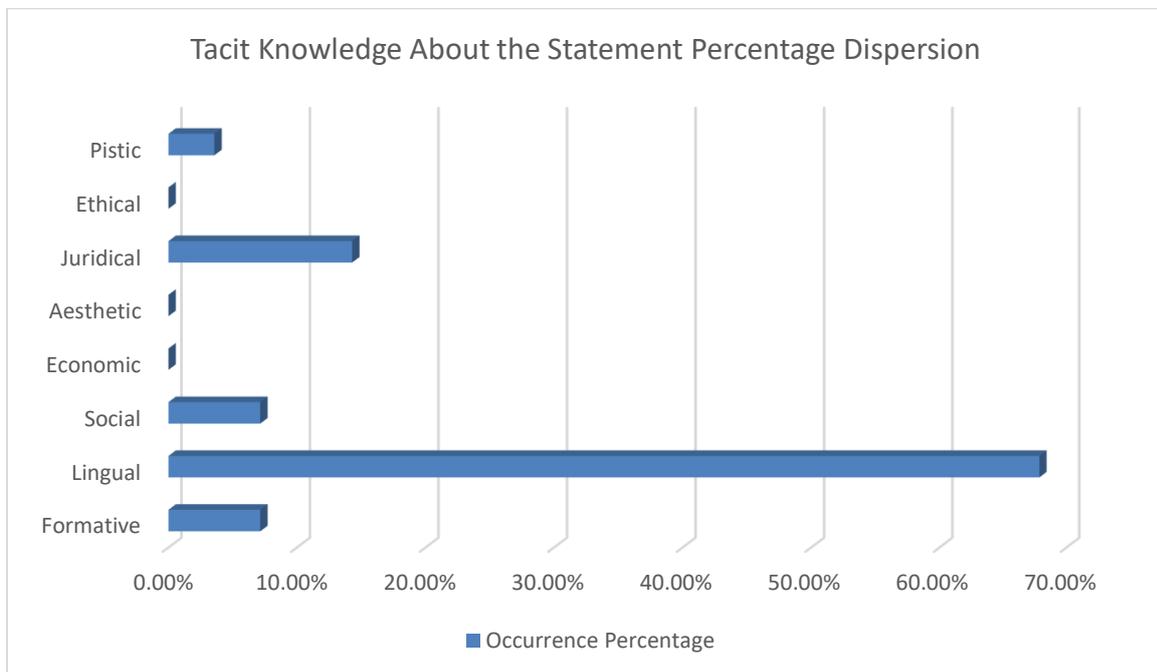
Type of Tacit Knowing	Interview + Phrase (Identifier)
Formative to Pistic Only	
Formative	01P02, 04P01
Lingual	01P01, 01P02, 01P03, 01P04, 01P05, 02P02, 02P03, 02P06, 03P02, 04P02, 04P04, 04P05, 05P01, 05P02, 05P03, 05P04, 05P05, 06P01, 06P02
Social	01P03, 02P01,
Economic	
Aesthetic	
Juridical	02P04, 02P05, 03P03, 04P03
Ethical	
Pistic	03P01

Percentage - Count Comparison for Tacit Knowledge About the Statement

Type of Tacit Knowing	Occurrences	Percentage
Formative to Pistic Only		
Formative	2	7.14%
Lingual	19	67.86%
Social	2	7.14%
Economic	0	-
Aesthetic	0	-
Juridical	4	14.29%
Ethical	0	-
Pistic	1	3.57%

Bar Chart representing the percentage dispersion for Tacit Knowledge About the Statement:

Figure 18: Bar Chart of Tacit Knowledge About the Statement



In terms of the tacit knowledge about the statement, it is bound to the understanding of the linguistic characteristics of the communication between the researcher and the participants and thus, lingual tacit knowing would be the most dominant form of tacit knowledge determined.

Other forms of tacit knowing such as juridical, formative, pistic and social define the constructs that lead to the construction of the statement. A statement cannot hold meaning unless it projects to its origin. A further discussion of these results will be undertaken after this section.

Tacit Knowledge behind the Statement Content

Figure 19: Tacit Knowledge behind the Statement Content Data

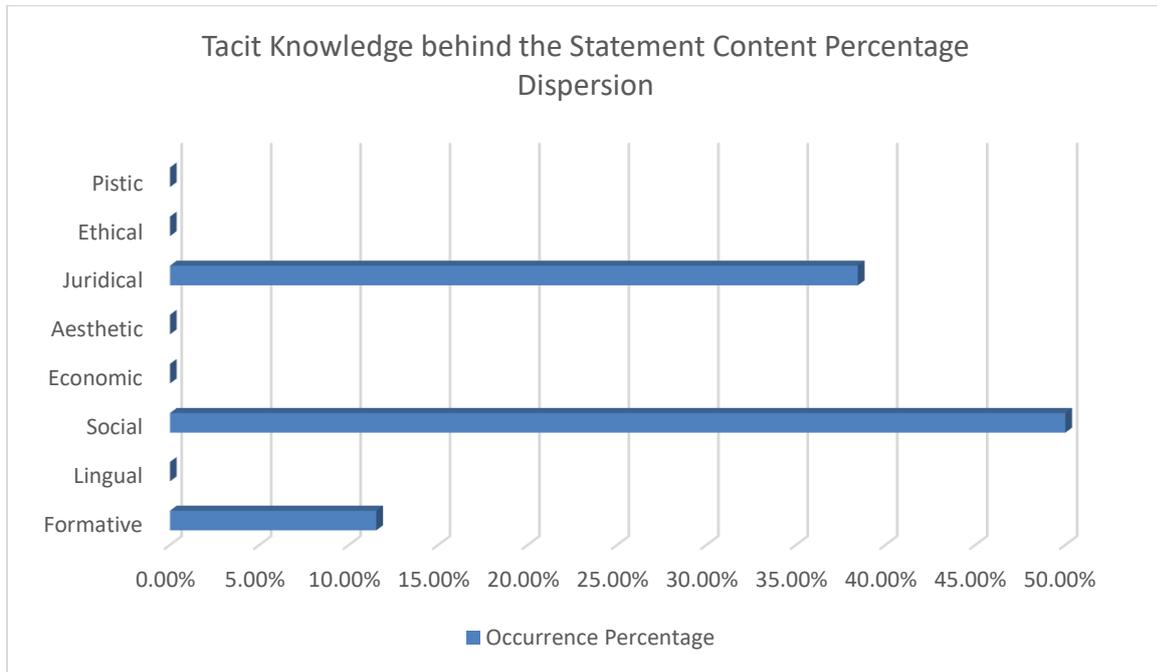
Type of Tacit Knowing	Interview + Phrase (Identifier)
Formative to Pistic Only	
Formative	01P02, 02P03, 04P01
Lingual	
Social	01P01, 01P04, 02P01, 02P02, 02P06, 03P01, 03P02, 04P02, 04P04, 05P02, 05P05, 06P01, 06P02
Economic	
Aesthetic	
Juridical	01P03, 01P05, 02P04, 02P05, 03P03, 04P03, 04P05, 05P01, 05P03, 05P04
Ethical	-
Pistic	-

Percentage - Count Comparison for Tacit Knowledge behind the Statement Content

Type of Tacit Knowing	Occurrences	Percentage
Formative to Pistic Only		
Formative	3	11.54%
Lingual	0	-
Social	13	50.00%
Economic	0	-
Aesthetic	0	-
Juridical	10	38.46%
Ethical	0	-
Pistic	0	-

Bar Chart representing the percentage dispersion for Tacit Knowledge behind the Statement Content:

Figure 20: Bar Chart of Tacit Knowledge behind the Statement Content



The tacit knowledge behind the statement presents the social understanding of the statement within the linguistic frame of communication. Thus, understanding a statement would elicit how the world or that sector of society understands the statement and thus require social tacit knowing. Most statements are usually based on the notion of either making a judgement about a situation or based on understanding a statement due to the skills or knowledge possessed in a field that allows the actor to disseminate the meaning of the situation. It is notable that only three forms of tacit knowing are identified in the content behind the statement; but this might rest on the conditions and parameters of the language of communication rather than a lack of other forms of tacit knowing present in the tacit knowledge behind the statement content.

5.3 Making the Statement (Making the utterance)

The nature of making an utterance or statement has shown that there are different levels of tacit knowing functioning that have been illuminated.

This section is divided into two areas:

Of the three different sections of the data analysis, making the statement segment proved to be the most interesting in terms of exploring tacit knowing functioning in relation to how human beings communicate with each other.

There are a few generalisations that have been made, for instance, the utterance can either be a criticism or information. This is limiting but shows how different types of utterances can be disseminated in the follow of the utterance.

The first stage: Take the statement: The tacit knowledge which allows the persons involved in the conversation to understand each other.

The second stage: Determining what type of utterance or statement it is. E.g. is it a criticism or a piece of information?

The third stage: The tacit knowledge that allows one to determine what type of utterance it is.

The fourth stage: The explicated content of the utterance or statement.

The fifth stage: Intended or explicit meaning of idioms –rooted in shared background knowledge.

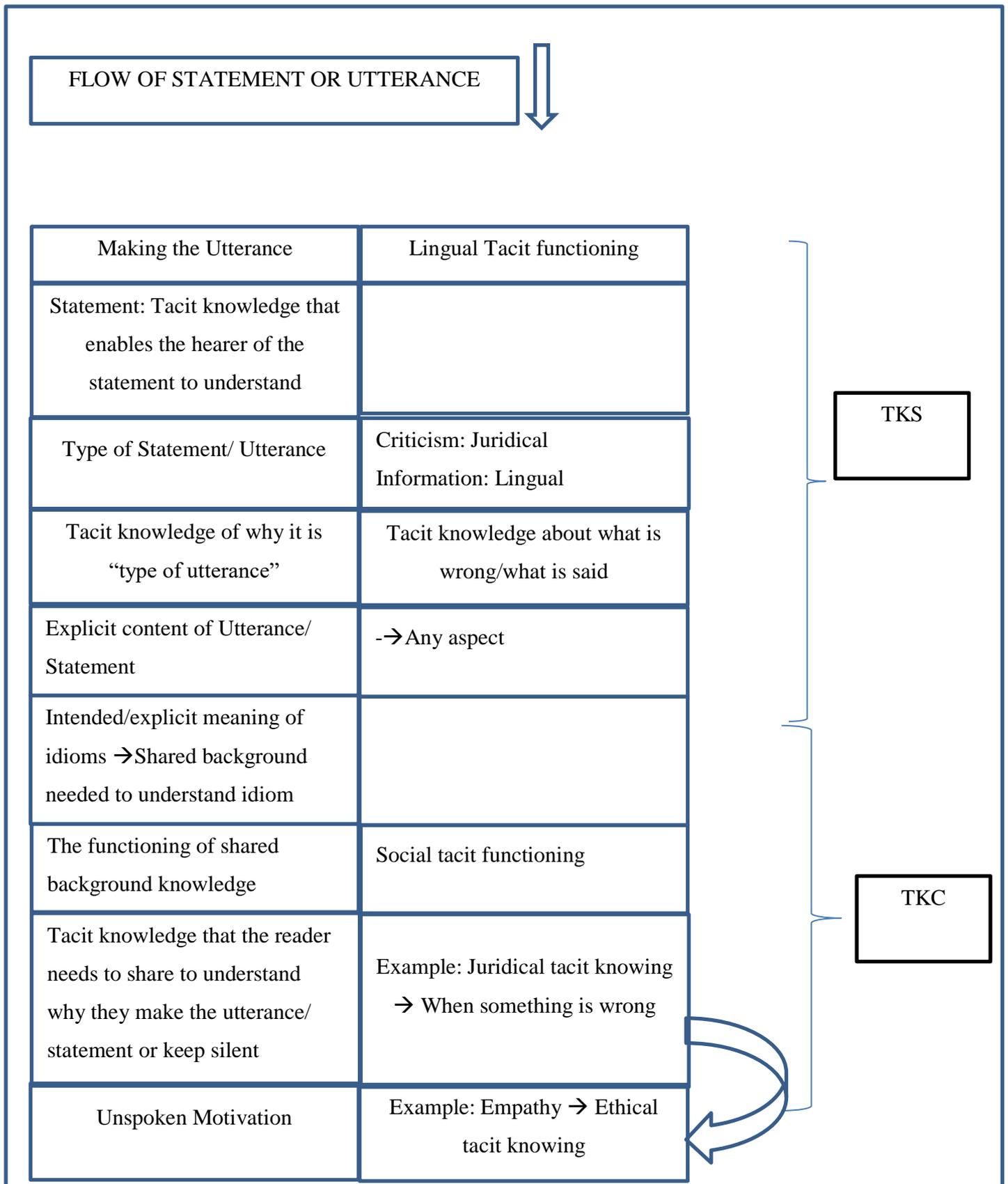
The sixth stage: The functioning of shared background knowledge.

The seventh stage: Tacit knowledge that the reader needs to share in order to understand why they make the utterance or altogether remain quiet in certain conditions. For example:

juridical tacit knowing in deciding whether something is wrong. Which then leads to the last stage.

The eighth stage: Unspoken motivation. E.g. Ethical tacit knowing...taking the stage seven example; when the actor decides that something is wrong in a situation, then they empathise with the person under the decidedly bad situation. (Empathy seems to fall under ethical tacit knowing most of the time).

The flow of the utterance, in this case a conversation between two human beings was defined as follows (this shall be indicated as figure 5.3): **Figure 21: Flow Of Utterance/Statement**



5.4 Conclusion

The analysis chapter has covered the three stages of aspectual analysis identified in formulating a coherent method of exploring the data gathered from the interviews. It has shown the different sections that the researcher decided to calibrate the interviews into in order to illuminate different forms of tacit knowing, and shown how inter aspect reaching out has been invaluable in determining what form of tacit knowledge is identified in each scenario of the interviews. The chapter has also shown how the second stage of analysis has gathered the data produced to show the variance in types of tacit knowledge mapped for the different areas of spoken and unspoken motivations, tacit knowledge of the statement, and determined what forms of tacit knowledge could have been explicated. Thus, the next stage involves a discussion of these findings and placing them in the context of the problems that this thesis wishes to resolve.

Chapter 6: Discussion & Findings

6.1 Introduction

This chapter focuses on the findings of the research and threads through from the initial objectives of the research towards the illuminated elements in the qualitative field research. It shows how meeting the objectives set at the start of the study led to resolving problems identified in the literature review and, how utilising a Dooyeweerdian method of aspectual analysis aided in generating surprising results from the qualitative study, further illuminating our understanding of tacit knowledge. This chapter begins by providing a chronicle of what Dooyeweerd understanding was expected to do in the conceptual framework; how this made sense of the debates in the three main focus problematic areas of the nature of tacit knowledge, explication and the identification of tacit knowledge. This chapter also discusses how using Dooyeweerd as a lens helped the researcher to reveal and subsequently analyse tacit knowledge. In addition, this chapter covers a discussion on how to map tacit knowledge in use while using interviews and gives a detailed discussion on how this relates back to the philosophical analysis of the literature review in terms of how different authors relate to tacit knowledge through altered lenses. Finally, this chapter discusses how the empirical research aids the theoretical framework in making sense of the debates in tacit knowledge and how this method has allowed the researcher to extend the ways in which Dooyeweerdian theories can be used as tools for analysis.

6.2 Summary of What Dooyeweerd Understanding is Expected to Do

The theoretical framework allowed the researcher to create a foundation from which the problematic could be addressed in a systematic manner.

6.2.1 Make Sense of The Debates

6.2.1.1 Variety of Definitions

In this section the researcher has identified two main findings about how conflict arises due to the variety of definitions of tacit knowledge. The researcher identifies two main areas that cause conflict and has shown how the theoretical framework has aided in trying to bring agreement in the discourse.

6.2.1.1.1 Nature of articulation of Tacit Knowledge

Using a Dooyeweerdian framework has allowed for clarification of the different definitions and meanings of the term tacit knowledge. A fundamental distinction has been made that asserts that there are different forms of tacit knowledge and each has different levels of explication. Large areas of current literature on tacit knowledge assumes, from flawed application of philosophical underpinnings knowledge, that there are absolutes on how we should view the nature of tacit knowing in relation to its constituent elements. A Dooyeweerdian framework allows us to view tacit knowing on a multi-aspectual plane whereby the issue of articulation, verbalisation and linguistic nature of tacit knowledge can be accommodated. The theoretical framework of this research allows us to show tacit knowledge in different levels of being articulable (post psychic tacit knowing) and also unarticulable in certain parameters, specifically all forms of tacit knowing before psychic tacit knowing.

As Yu (2006) notes, the object domain of the theory of tacit knowledge is knowledge and knowledge can always find a mode of articulation, though not necessarily verbal articulation. A Dooyeweerdian framework accounts for this observation and helps place forms of tacit knowing into categories that allow for greater understanding of the nature of tacit knowing when dealing with articulation.

When we perform a philosophical investigation into the nature of tacit knowledge, we find that the theoretical framework utilised in this research seems to enhance and negate some of the general principalities on the matter. From a rudimentary case of Gestalt's thesis of tacit knowledge where a separation engagement in a particular activity require a reliance on a certain unproblematic background otherwise the activity cannot be efficiently carried out. This background activity in Gestalt's thesis cannot be articulated in linguistic means by itself. However, from the theoretical framework designed in this research, we can account for this background activity through the use of aspectual determination; whereby the unarticulable background can be surmised to be pre-analytic. At the beginning of this research it was the intention of the researcher to explore all avenues of theoretical tacit knowing. However, it is becoming clear that, due to the method of data collection, most forms of tacit knowing that can be identified exist post the social functioning on Dooyeweerd's modal aspects range.

Interviews are a lingual form of research and thus most data collected seems to indicate a post-lingual functioning. Both psychic knowing and formative knowing are much more difficult to identify using interviews, but can be speculated due to foundational dependency as explained in section 3.1.3. Functioning in later aspects, as presented by Dooyeweerd, requires functioning in earlier aspects as well. Thus, functioning in post-lingual knowing requires functioning in earlier aspects such as psychic knowing and formative knowing.

In the case of the thesis of epistemic regionalism as described by Grimen (1991), the theoretical framework in this research can complement epistemic regionalism as being a system comprised of all twelve forms of knowing both tacit and explicit. The theoretical framework described in Chapter 3 allows for separation of these forms of knowing into groupings that the thesis of epistemic regionalism attempts to describe separately. Tacit knowledge in this case is described as being the element of the system that is verbally unarticulated knowledge that we possess in our thinking at any given time. The researcher

can thus surmise there to be a description of knowledge that is pre-analytical in nature, but as the system of epistemic regionalism includes all forms of tacit knowing in its description of a system of knowing, a conclusion can be reached that whole elements of tacit knowing are considered explicit in nature, but are actually tacit and thus omitted in consideration as tacit knowledge. This reinforces the notion of inclusivity that the theoretical framework of this research possesses relative to other writings on the nature of tacit knowledge.

In the case of Grimen's (2001) strong thesis of tacit knowledge, we find that there are specific kinds of knowledge that are in principle verbally unarticulable paving the way for a logical gap between our capacity of cognition, experience and action and our capacity for verbal articulation in the other. The theoretical framework of this research complements this notion of explicitly claiming that there are some forms of tacit knowledge that cannot be articulated and this forms part of the foundation from which a Dooyeweerdian framework improves on; and to give these forms of tacit knowledge a spectrum through which certain forms can be researched to illuminate those that cannot. Yu (2006) concludes that Grimen's strong thesis focuses the discussion on not only the distinction between what is articulable and what is not in the absolute, but what is in principle verbally articulable and what is not.

Grimen (1991) four interpretations of viewing tacit knowledge can be compared with a Dooyeweerdian framework in the following ways:

First Interpretation: Grimen (1991) calls this the thesis of conscious under-articulation. In this view, tacit knowledge is something that we consciously attempt to conceal, to avoid articulating or under-articulate. Yu (2006) gives the example of in the case of marriage or political discourse, it may be wise for the partners not to reveal all that they know about each other. Relative to Dooyeweerdian framework, we can account for this interpretation within the forms of knowing that have explicit components to them, that is lingual and analytic

knowing. One cannot consciously conceal tacit knowledge. The process of tacit knowing is not conscious, however, the **lingual and analytic forms** are explicit in nature, but have tacit elements and can thus be articulated and known, but in the context of Grimen's first interpretation, consciously concealed by the knower. The first interpretation of Grimen's view of tacit knowledge is too weak to be held robustly within epistemology.

Second Interpretation: Gestalt's thesis of tacit knowledge: When one is engaged in a certain activity like playing piano, riding a bicycle, one has to rely on a certain unproblematic background otherwise the activity cannot be fluently carried on. As Yu (2006) puts it, "this is to say that the unarticulated background that is necessary for the performance of a certain activity cannot be articulated by the agent himself in the process of performance. The knowledge that the agent has about this unproblematic background is a kind of tacit knowledge. It is worth mentioning that this interpretation of tacit knowledge only claims that for the sake of not obstructing the performance of an activity, the agent cannot articulate verbally the background on which he relies. It does not assert that this kind of knowledge is unarticulable in principle. What the agent cannot articulate linguistically in the process of performance of the activity can, Grimen thinks, be articulated by others or by himself after the performance." This can be analysed from a Dooyeweerdian lens in the following way:

- i.) The unarticulable background necessary for performance relates to skill navigation and this can be described as formative tacit knowing.
- ii.) The ability to articulate this tacit knowledge after the performance and not within the performance itself is also partly described by Polanyi's tacit knowing. Within that frame, then the second interpretation can be described as encompassing both **psychic and formative** forms of tacit knowing. This still constitutes a weak interpretation of the whole scope of tacit knowing, only being narrowed to small range of the whole spectrum of tacit functioning.

Third Interpretation: The thesis of epistemic regionalism: All knowledge that a person possesses constitutes a vast, loosely knit and non-perspicuous system. At any given instance, one can only reflect on small parts of this knowledge system and verbally articulate them. No one can articulate the whole system simultaneously. No specific elements of tacit knowledge are unarticulable, but at a given moment, the knowledge that we can verbally articulate is limited. From a Dooyeweerdian perspective, verbal articulation of tacit knowledge is limited to the forms of tacit knowledge that can be articulated; that is: the ten forms of tacit knowledge that have been researched in this dissertation, but not including physical and biotic knowing which are also forms of tacit knowing that cannot be verbally articulated, but maybe articulated in other ways. The knowledge system described by Grimen in this third interpretation may partially describe the process of tacit knowing within the full spectrum of the twelve forms of tacit knowing that can be delineated from Dooyeweerd's theory of knowing. However, the principle that all forms of tacit knowledge can be verbally articulated is a major difference between this third interpretation and the interpretation of Dooyeweerd's theory of knowing in this dissertation.

Fourth interpretation: "Strong thesis of tacit knowledge": From this perspective, there are specific kinds of knowledge that are in principle verbally unarticulable, which means that there exists a logical gap between our capacity of: cognition, experience and action; while on the other hand our capacity for verbal articulation. This knowledge that is in principle unarticulable is tacit knowledge. The strong thesis of tacit knowledge is not concerned with the distinction between what is articulable and what is unarticulable, but with the distinction between verbal articulation and non-verbal articulation. From a Dooyeweerdian point of view, the notion of verbal articulation can cover the forms of knowing from psychic to pistic on the rigid hierarchy of Dooyeweerd's ways of knowing as in figure 3 of the dissertation. For non-verbal articulation, this could cover the two forms of knowing in physical and biotic forms of

knowing. However, Grimen deviates from this Dooyeweerdian form of knowing by claiming that tacit knowledge cannot be verbally articulated, but only through non-verbal means. This dissertation has shown that tacit knowledge can be articulated through verbal means, but also accounted for forms of tacit knowing that cannot be articulated in verbal articulation.

Dooyeweerdian framework not only incorporates this notion of the Grimen's description of a strong thesis for tacit knowledge, but also provides the ability of separation of different forms of tacit knowing, speculation on forms which can be articulated, partially articulated or wholly unarticulable, in verbal or non-verbal ways, and allows the theoretical framework to build a foundation from which the nature of tacit knowledge can be perspicuously engaged in different areas of research.

6.2.1.1.2 Individual vs Shared Tacit Knowledge

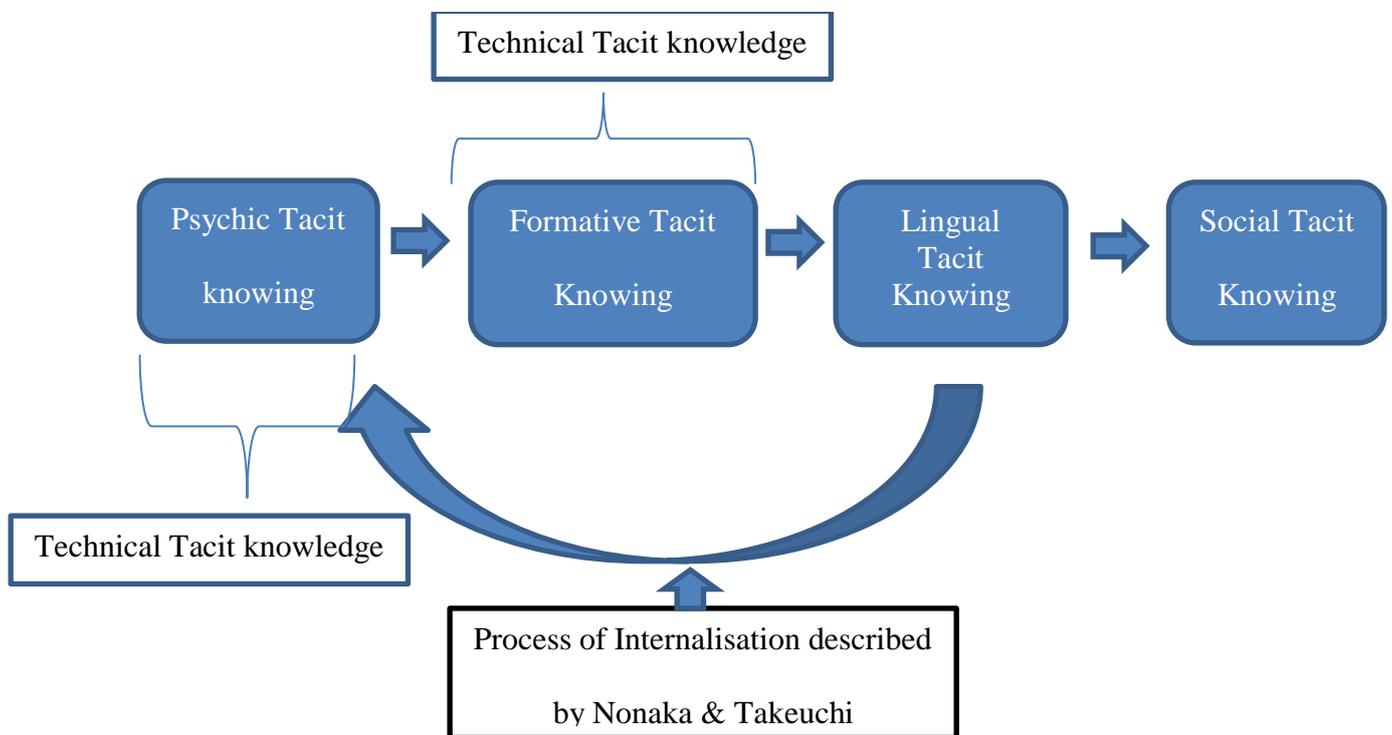
The notion of whether tacit knowledge resides in an individual only or is collectively held by a group or both, has been an issue that dominates current tacit knowledge literature. Conflict arises on how to define tacit knowledge correctly while the nature of tacit knowledge has not been perspicuously mapped out.

The first element of the theoretical framework that works to aid this problem is the nature of multi-aspectual forms of tacit knowledge. This separation allows us to view tacit knowledge both individually and collectively. In the case of Nonaka and Takeuchi (1995)'s model of knowledge creation, they claim that tacit knowledge (in their case technical tacit knowledge) is created by individuals' actions and direct experience in the 'here and now', and also that cognitive tacit knowledge is transmitted through social activity or can be internalised by the individual through the reading of explicit knowledge contained in elements such as books. To assess this view of individually held tacit knowledge, the conceptual framework used in this research has allowed the researcher to identify the different forms of tacit knowledge being

discussed here by Nonaka and Takeuchi. In the first case, Nonaka and Takeuchi are discussing formative tacit knowing; concerned with acquiring skill and experience in the ‘here and now’; in the second case of cognitive tacit knowing, Nonaka and Takeuchi are discussion two forms of tacit knowing. The first being psychic tacit knowing that resides in a person individually and the second alluding to lingual tacit knowing dependency on psychic tacit knowing of internalising tacit knowing from conversations with other staff and from sources such as books. The diagram below shows the forms of tacit knowing, as developed from the conceptual framework to represent Nonaka and Takeuchi’s model.

Figure showing the representation of tacit knowledge from Nonaka and Takeuchi’s model:

Figure 22: Nonaka & Takeuchi Model in Dooyeweerdian Terms

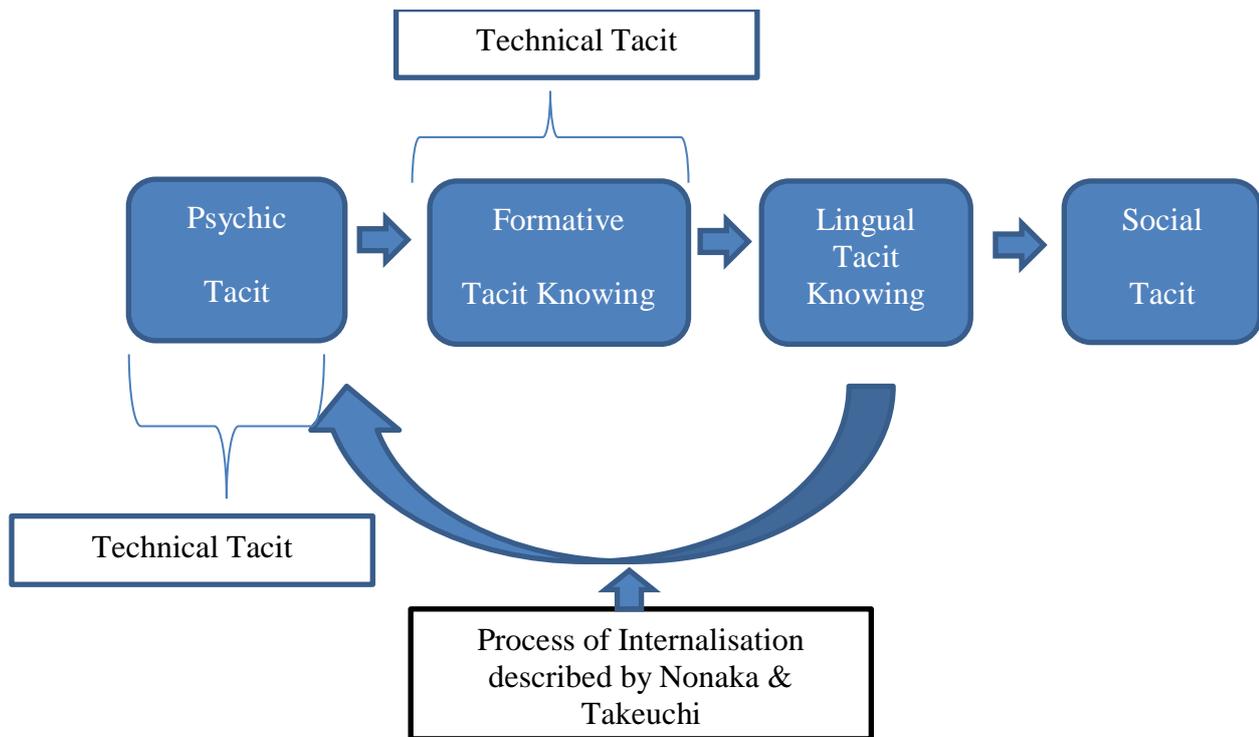


The issue of individually held tacit knowledge relative to collectively held tacit knowledge does not feature in the Nonaka and Takeuchi model. Their description is only limited to three forms of tacit knowing. An omission of other forms of tacit knowing does not denote that other forms of tacit knowledge don't exist, but rather that their model for tacit knowing does not include other forms.

Aadne et. al (1996) describe tacit knowledge as not only a personal phenomena, but also residing in an individual and the social relationships in the organisation suggesting a collective nature to the phenomena. Von Krogh (1996) also supports the view that tacit knowledge can exist in relationships while Von Krogh and Roos (1995) argue that it is an individual trait alone and cannot be communicated while Baumard (1999) suggested that there are two forms of organisational knowledge that cannot be articulated implicit (knowledge that we know but we do not wish to express) and tacit (knowledge which we cannot express) and argued that it is important to recognise knowledge in general can be an attribute of individuals and of groups.

A logical dilemma seems to exist on where to place the limits of individually held tacit knowledge and tacit knowledge held by collectives. The conceptual framework of this research has helped in addressing where those conditions exist. In the table below, an extension to the previous table on individually held tacit knowing shows how collectively held tacit knowing is a form of social tacit knowing and a parity does not need to exist on whether tacit knowledge is either individually held or collectively held or both, but that these instances form different forms of tacit knowing that exist simultaneously for different elements of the process of knowing for human beings.

Figure 23: Rudimentary illustration of Individual & Collective Tacit Knowing



The diagram above gives a rudimentary relationship between individually held tacit knowledge and collectively held tacit knowledge. However, it does not include the complexity of anticipatory dependency on other forms of tacit knowing. Tacit knowing on the spectrum of knowing from physical tacit knowing to the psychic form of knowing have an individually held trait. However, it seems that due to dependency on the social tacit knowing, the economic, aesthetic, juridical, ethical and psychic forms of knowing also have a collective element to their forms of knowing.

Thus, the following table shows what forms of knowing are individually held, collectively held or both (we'll name the table figure 6.2.1 (24 in table of figures):

Figure 24: Solution for Individual & Collective Forms of Tacit Knowing

Type of tacit knowing	Individually Held (I)	Collectively held (C)	Both individually and Collectively held (I & C)
Physical	I		-
Biotic	I		-
Psychic	I		-
Analytic	I	C*	I & C
Formative	I		-
Lingual	I	C	I & C
Social	I	C	-
Economic	I	C	I & C
Aesthetic	I	C	I & C
Juridical	I	C	I & C
Ethical	I	C	I & C
Pistic	I	C	I & C

As shown in the figure above, the conceptual framework allows us to resolve the issue of whether tacit knowledge is individually or collectively held. The nature of tacit knowledge can thus be better defined in literature and aid in the resolve of conflict where conflict need not exist.

Explanation of C*: A deviation from the norm.

We might expect the analytic to be purely individual, but the case of Collin's sapphire study points to collective analytic tacit knowing. The researcher will elaborate on this phenomena:

Analytic knowing as defined in the conceptual framework Chapter 3 consists of being able to differentiate between right and wrong, as opposed to the analytic aspect in functioning which allows gives the subject the ability to differentiate between different objects. Thus, collective determination of whether something is right or wrong might seem irregular and this presents one of the findings from exploring the literature review. Collin's sapphire examination of how tacit knowledge was transferred from one group of scientists to another explored the notion as he called it of "mismatched salience" (A form of knowing that consisted of looking for the wrong thing).

The study in question goes as follows:

Taking the example of Collins (2001) study explored in Chapter 2, this explored the notion of tacit knowledge by examining how the quality of sapphire was determined by two groups. At the time of his research, he indicates that the Russians had performed measurements on the quality of sapphires 20 years before the same experiments could be carried out in the west.

He argues that the failure to transfer tacit knowledge of how to make these measurements had been responsible for some of this delay. While the theory behind the measurement of sapphire quality had been known for some time prior to the early 1990s, no one had succeeded in validating it. A Russian group was the first to do so, but when Western scientists were unable to repeat the experiments, the Russian success was discounted. It was not until a Russian team visited the UK, and demonstrated what they had done, were they believed. But it then became clear that the experiment required a great deal of expertise to get it to work. More interestingly the Russians discovered that they did not fully understand how

their set-up worked. It was only after much work with the apparatus did the two teams begin to realise the significance of certain materials (specifically, a suspension thread) and of how they were separated. In discussing this case, Collins refers to several types of tacit knowledge – “mismatched salience” (people looking at the wrong thing); “ostensive knowledge” (knowledge that’s easier to convey by pointing rather than talking), and “unrecognised knowledge”, such as the importance of the suspension materials. In this Collins acknowledges that “mismatched salience” (looking for the wrong thing) was a form of tacit knowing, but did not categorise it being individual or collective. It is the determination of this researcher that in this instance, mismatched salience presents a form of collectively looking for the wrong thing, and with that, it means that a group of people can also look for the right thing. In other words it presents a form of analytic tacit knowing. Thus, if we come to the conclusion that a group of people can collectively “look for the wrong thing”, then it consequently means that there is a collective form of analytic knowing.

6.2.1.2 Explication of Tacit Knowledge ‘Practical’ Literature

In philosophical literature the issue of explication, mostly noted as articulation, relates to whether tacit knowing is explicable in any form and, if it is, what levels of explication can be achieved. This has been addressed in section 6.2.1.1.1.

In practical literature, most notably organisational management and knowledge management, the researcher finds that the issue of explication of tacit knowledge falls under the domain of knowledge transformation and capture; specifically interested in making tacit knowledge explicit to exploit it as a competitive resource. In section 7.2.1.1.2, the researcher shows how a partial application of Nonaka & Takeuchi’s model attempts to incorporate tacit knowing. For this section, the researcher will examine Nonaka’s model of knowledge conversion and show how the conceptual framework interprets the different elements of trying to explicate tacit knowledge. Nonaka & Takeuchi (1995) use the term externalisation to indicate a

transition from tacit knowledge turned to explicit knowledge. In his book *The Knowledge Creating Company*, Nonaka (1991) gives the example of Honda as a way of showing how tacit knowledge can be made explicit. In the example, Nonaka points out that in order for the company to innovate, it takes a radical shift to group together young engineers and see what the group will come up with. The group leader comes up with a slogan which at first seems ambiguous to the other members of the team and, while deliberating between themselves about what the slogan means, they come up with their own slogan as a collective understanding of what is required from them. Through the ambiguity of the mission statement, the team finds that the chaos created has generated an environment where radical designs are suggested by different people and by the end they come up with a design that would not have happened if the conditions of their working were not present. The team had clear belief of what was expected from them, even though the mission itself was fraught in ambiguity. Nonaka claims that these conditions allow for tacit knowledge to be made explicit and thus shared between different people to the benefit of the company. Using the conceptual framework designed in this research a few observations and findings about Nonaka's process can be surmised.

The first is that Nonaka views tacit knowledge as a collective entity that is separate from explicit knowledge. From this point, even though he is able to note that tacit knowledge has influenced the end results of the design team, he cannot be able to point to the different stages at which tacit knowledge was made explicit. The use of slogans and metaphors as a way of making creative ambiguity is one area which he tries to insist has made a huge difference in making people communicate effectively with each other. A deduction using the theoretical framework is that lingual tacit knowing allows the team to effectively communicate with each other and arrive at meanings behind statements which they cannot fully explicate. This can be described as a form of explication of lingual tacit knowing.

The second part is that Nonaka rightly acknowledged that bringing together people in a closed system generates a scenario for sharing tacit knowledge. However, he does not indicate that there is collective social tacit knowing from the engineers who work in a company with a particular culture. This is also a contributing factor to the success. Another element is the fact that they all have a unified belief of what they are expected to accomplish, but are not certain what that is. Speculation can be made that this relates to pistic tacit knowing.

From a number of scenarios attempting to analyse how to make tacit knowledge explicit, it is clear to the researcher that lack of knowledge about different forms of knowing, leads to an important omission of what made a certain situation breed results that can be attributed to tacit knowledge being made explicit.

6.2.1.3 Identification of Tacit Knowledge

Identification of tacit knowledge depends on how the process of collecting data that can be determined to be tacit knowledge. Empirical studies on tacit knowledge show that there is no agreed data collection method, and this is primarily due to the ambiguity on what the concept of tacit knowledge pertains. From this a wide variety of empirical tests have been conducted each claiming to be examining the concept of tacit knowledge, but in effect seem to be examining a partial part of the notion of tacit knowing.

6.3 Empirical Support that Dooyeweerd can make sense of the debates

With reference to the numerical analysis performed in section 5.3, the researcher aims to present arguments that support the notion that the findings in the empirical study can help in making sense of the debates that exist on the nature of tacit knowledge:

1. The existence of multiple types of tacit knowledge:

If we perform a review on the five different sections of the analysis data we find that: If we map an aspect of knowing, against its occurrence in the five different sections (we'll refer to it as figure 6.3, (25 in table of figures), we find:

Figure 25: Evidence of Multiple forms of knowing in Analysis

Aspect of knowing	Spoken Motivations (SM)	Unspoken Motivations (UM)	Can it be Explicated (EX)	TK about statement (TKS)	TK behind content of statement (TKC)
Formative	SM		EX	TKS	TKC
Lingual	--	--	(already has an explicit element to it)	TKS	
Social	SM	UM	EX	TKS	TKC
Economic	SM	-	EX	-	
Aesthetic	-	UM	EX	-	
Juridical	SM	UM	EX	TKS	TKC
Ethical	-	UM	-	-	
Pistic	-	UM	EX	TKS	

If we refer to figure 6.3, then we can ascertain that the basic principle that there exists multiple forms of tacit knowing due to their occurrence in multiple scenarios throughout the analysis. In conjunction with the definitions set for the different forms of tacit knowing, then the researcher asserts that this framework accounts for the different forms of tacit knowing described in literature and can be used to bridge different perspectives of tacit knowing to account for other forms of knowing without being in conflict.

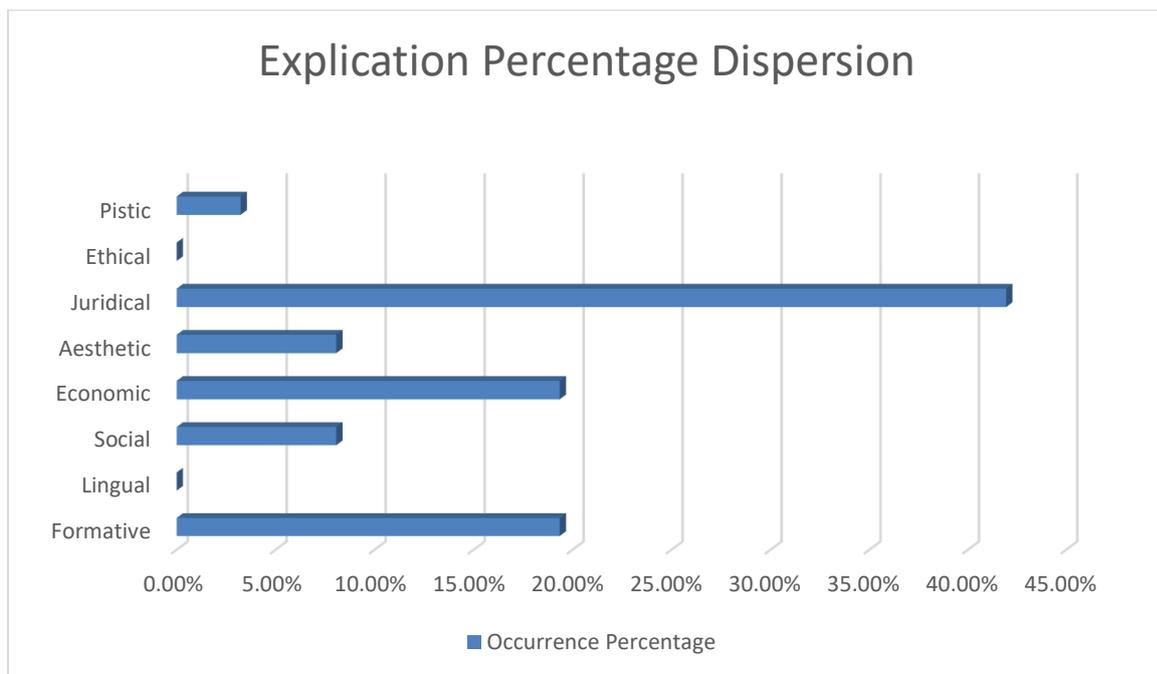
2. Individual vs Collective:

Figure 6.3 shows occurrence that supports figure 6.2.1 assertion; both individual and collective forms of tacit knowing are identified according to the definitions of the different forms of aspectual knowing. By showing occurrence in the social tacit knowing in all the five different sections of figure 6.3, then the researcher makes the claim that this is strong proof that collective tacit knowing is a real phenomenon and overwhelmingly present in our societies. Due to foundational dependency of the social aspect, it is evident to the researcher that not only is social tacit functioning the only collective form of tacit knowing, but each aspect after and including the lingual aspect of knowing (that is, lingual, social, economic, aesthetic, juridical, ethical and pistic) all have a collective element to their form of knowing. All forms of knowing displayed in figure 6.3 except for social tacit knowing have an individual element to their form of knowing. Thus, it is the conclusion of the researcher that these findings present evidence to suggest that tacit knowing is consisted of both individual and collective forms of knowing.

3. Explication of tacit knowledge:

Referring back to figure 6.3 of this chapter we find that, according to the criteria used by the researcher, all forms of tacit knowing explored in this research, excepting ethical knowing, could be explicated. It is important to remember that while the lingual form of tacit knowing

was not identified with the method used as a possibility for explication, it is the nature of lingual tacit knowing to have an explicit element to it, and thus not occurring as an element in the table “can it be explicated” should not be taken as an indication that lingual tacit knowing cannot be explicated. This would be going against its nature and would have ramifications due to foundational and anticipatory dependencies. Taking the graph of occurrence of “can it be explicated” from Chapter 5.3 as shown below:



Then we can assert that different forms of tacit knowing have a higher probability of being explicated than others. The occurrence percentages are useful in improving discussion by showing what forms of tacit knowing might be easier to explicate than others. Although not a rigid conclusion, this can aid the researchers utilising the methods employed in this dissertation on what forms of tacit knowing would be encountered while attempting to explicate. It may also provide a platform for discussion on the implications of tacit knowing within an organisation’s workforce in finding out what the workforce finds most important, but is never articulated within the organisation.

In this dissertation, we found juridical tacit knowing to have the highest occurrence rate of the forms of knowing that could be explicated. We also find that of the explicable forms of tacit knowing, they each seem to exhibit a different level of occurrence and the researcher makes the assertion that this might indicate the ease or difficulty of explicating the different forms. While the non-explicability of the ethical form of tacit knowing is strange, the researcher suggests that there may be scenarios of data collection methods that may help in determining its explicability. For example: if observations were used instead of interviews, then the data collected there might be able to discern explicability of ethical tacit knowing. There is also the element of foundational dependency of ethical tacit knowing to psychic tacit knowing due to its indwelling nature. This might prove to be the most difficult form of tacit knowing to explicate. Collectively, the analysis shows that the explicability of tacit knowing may be bound doubt. However, criticism might be launched on whether the tacit knowledge explicated in this research is actually tacit at all. Together with the different properties of aspects described in Chapter 3 of this dissertation and the findings from the empirical study, it is the assertion of the researcher that these forms of tacit knowledge explicated are indeed tacit until revealed using aspects to determine their explicability.

4. Identification of tacit knowledge:

The analysis of this dissertation has provided a platform that can be used to determine how different forms of tacit knowing can be investigated through the use of interview data. Most literature presents conceptual frameworks that are reliant on a singular view of tacit knowing, instead of accounting for most forms of tacit knowing. Aspectual analysis, aided by inter-aspect reaching out described in Chapter 3, has illuminated how tacit knowledge present in our systems of society can be mapped and accounted for, and this research presents a foundation for which different empirical studies could expound on when exploring the notion of tacit knowing. The researcher does not assert that this method is superior to others in

illuminating tacit knowing, but suggests that there are observations within this method that can be applied to other widely used perception designing methods such as repertory grid technique that could benefit from viewing the notion of tacit knowing from the point of view of this research.

6.4 Utterance and Tacit knowledge

Taking the figure determined in Chapter 5.4 of this dissertation, the link between tacit knowledge functioning and utterances might be an arena for further exploration that could bear fruit in multiple disciplines, such as artificial intelligence, and being able to map how human beings communicate with each other and the tacit knowledge structure present in a conversation between humans. The flow of the statement might be the building blocks to which we can be able to discern different elements of tacit knowing while it's in action. The researcher speculates that an exploration of this would be on a similar scale to the human genome project, whereby the entire workings of tacit knowledge and knowing in human beings is mapped and accounted for in different research fields. Authors such as Gill (2015; 2008) have explored the notion of the relationship between tacit knowledge and utterances in the realm of artificial intelligence and, although constraints of viewing tacit knowledge from a limiting perspective, their work shows that it is possible for this kind of mapping to be achieved. This might be especially useful for psychologists or professionals studying human communication behaviours. Figure 5.3 in Chapter 5 describes the process of this flow of the statement or utterance and how it could be mapped.

6.5 Using Dooyeweerd to Analyse Tacit Knowledge

The use of Dooyeweerd to analyse tacit knowledge has been enriching to the study of how Dooyeweerd's theory of knowing can be used to illuminate different elements of tacit knowing, but also the study of human knowledge.

The most important element to note is that it is not foundational or anticipatory inter aspect relationships that help reveal most forms of tacit knowledge and determined their explicability, it is the notion of inter-aspect "reaching out", a phenomenon discussed in Chapter 3.3 on the properties of aspects.

6.6 Summary of Final Framework for Identifying and Explicating Tacit

Knowledge in SMEs

The initial framework presented in chapter 3.6 of this dissertation has been appended and in other sections amended in light of the findings of the qualitative research and aspectual analysis. Below is are the properties of the final framework designed in this dissertation:

Two major areas of Dooyeweerd's philosophy utilised are:

- i.) The Modal Law-Spheres & their properties: Indicated as aspects (Basden's term).
- ii.) The Theory of Knowing

i.) Modal Spheres (Aspects):

Within the Modal Law-Spheres (the aspects), properties of the aspects are used to determine aspectual functioning in the everyday experience. This covers the full spectrum of the aspectual suite.

This includes: Quantitative, Spatial, Kinematic, Physical, Biotic, Psychic, Formative, Analytic, Lingual, Social, Economic, Aesthetic, Juridical, Ethical, Pistic.

The arrangement of these aspects is shown in figure 1 of this dissertation in the rigid hierarchy that begins from the substratum sphere: Quantitative aspect, to the superstratum sphere; Pistic

Within these aspects, anticipatory and foundational dependencies are accounted for between the different aspects.

The property of inter-aspect reaching out is also applied in this framework; whereby one aspect reaches out to another, beyond dependency as shown in figure 2.

ii.) Theory of knowing

Within the theory of knowing, Basden's interpretation of the theory of knowing is used in conjunction with the researcher's interpretation of Dooyeweerd.

From this, we can be able to delineate knowing itself as opposed to limiting what can be known. The first three aspects of functioning shown in figure 1: Quantitative, Spatial and Kinematic are not included, because knowing implies irreversibility which enters the meaning-scheme only with the physical aspect.

Thus figure 3 of this dissertation shows how we can show the different forms of knowing from the physical form of knowing to the pistic form of knowing.

In addition the structure of the knower, what is known and the process of knowing are included in the framework so as to aid the researcher in the investigation of tacit knowledge at all stages of the research. Dooyeweerd puts the knower at the centre of the process of knowing and thus the knower is part of what is known rather than a detached observer. This characteristic aids the researcher to know that during the interview process, both the

interviewer and interviewee are part of what is known and not detached observers of what is being investigated.

The framework is then able to discern the nature of the form of tacit knowing being researched as shown by the figure in chapter 6.2.1, differentiating between tacit knowledge that is individually held, collectively held or possessing qualities of both individual and collective elements.

When performing the field work within an SME, the type of questions can be determined using an intuition criteria. This criteria can be created based on the aspects of functioning from a critical perspective of the research. The intuition criterion is based on the full spectrum of aspectual functioning. An example of the intuition criteria is given in chapter 4.6.3.2 of this dissertation.

Using the different elements of aspectual functioning and aspectual knowing, aspectual analysis can be carried out on the data in order to provide a platform for illuminating the properties of tacit knowledge. This can be achieved by dividing the data elements according to the description of chapter 5.2 of this dissertation.

The separation of the tacit knowing within the interview itself can be named as “making the statement”. From this the tacit knowledge of the interview process itself can be determined. This follows the laws of knowing as defined by Dooyeweerd that the process of knowing and the knower cannot be separated. The knower is part of what is known.

The next step is to determine the tacit knowing that can be determined from the answers of the interviewee; and this can be called, “the statement content” through which the unspoken and spoken motivations of the interviewee can be determined. From this different types of

tacit knowing can be discerned through aspectual assignment of the phrases used by the interviewee.

A final section of the aspectual analysis table is the, “can it be explicated” whereby the explication of different types of tacit knowing is determined through a deeper examination of the statement made by the interviewee.

6.6 Conclusion

This chapter has discussed the way in which the findings from the qualitative study have influenced the development of the theoretical framework. It has shown how different elements of the theoretical framework can be utilised to account for the different types of tacit knowledge in most of the literature on tacit knowledge. This chapter has also discussed how the empirical study influences or reinterprets the problems that the thesis aims to solve; in showing how the individual and collective nature of tacit knowledge can be explained and ultimately help in resolving conflict in literature. It has also shown how the spoken, unspoken and tacit knowledge about statement elements of the analysis can be used to identify different forms of tacit knowing, and also be utilised to resolve the explication dilemma encountered in practical literature; while also illuminating different philosophical observations into the articulation of tacit knowing as derived in most of philosophy. Finally, this chapter has discussed how the researcher has provided a new technique of using inter-aspectual reaching out to analyse data; thus extending the usefulness of Dooyeweerd’s theories. The next chapter will then discuss the limitations of the study, validity of the data and quality of the research; as well as documenting the contributions that the study has made.

Chapter 7: Contributions & Conclusions

7.1 Overview of the Research

This research has explored the notion of tacit knowledge by examining three fundamental constructs that constitute theoretical discussions: How the nature of tacit knowledge determines the different definitions in literature, whether tacit knowledge can be explicated and, finally, how to identify tacit knowledge in empirical studies or practical frameworks attempting to examine it.

The research began by examining the current literature on tacit knowledge and focused on the major discussions surrounding tacit knowledge. The literature review began by examining the nature of knowledge itself and how that influences how tacit knowledge is viewed as part of a binary condition of knowledge; in that knowledge is viewed as either tacit or explicit.

Arguments refuting this stand point and those supporting it were explored. The literature review then moved to show the conflict in literature brought about by the different definitions of tacit knowledge based on the ambiguous foundation of the nature of tacit knowledge. From this point the explication problem was explored showing the differing views on the explicability of tacit knowing, both from its philosophical foundations and its practical explorations. This led to an examination of different empirical studies on tacit knowledge and what they viewed as tacit knowledge based on their methods of identification.

The next part of the thesis was to formulate a conceptual framework which would attempt to resolve the problems explored in the literature review. The conceptual framework was based on Dooyeweerd's philosophy which is explained in Chapter 3 of the dissertation. This explanation ranges from giving an overview of Dooyeweerd's philosophy and gives reasons as to why using this philosophy as a research lens would help in breaking down the complexity presented with exploring a notion of knowledge itself. Dooyeweerd's theory of

knowing gives an explanation of how knowledge is viewed relative to other philosophies and influenced how the researcher viewed the relationship between the knower, the process of knowing and the knowledge being explored. Another fundamental element of Dooyeweerd's philosophy is explored in the form of the theory of modal aspects where the researcher shows how functioning multi-aspectually allows us to view knowing multi-aspectually and thus better define different forms of tacit knowing. The conceptual framework is then partially tested by performing philosophical analysis on current literature to show that it can theoretically distinguish different types of tacit knowledge from a wide variety of literal sources.

The conceptual framework requires practical testing and thus the next chapter, the research methodology sets the parameters for which the testing of the conceptual framework would need to adhere. The research methodology chapter begins by justifying the research paradigm relative to the chosen research lens and how to reconcile a relatively new philosophy with already established norms in research. The research method is then stipulated to be an interpretive and socio-critical research and justification for this is presented. The tool for research design is indicated, followed by the parameters of the research tool which, in this case, is the use of qualitative semi-structured interviews. From this, a pilot study is examined and results plotted which lead towards defining the research domain and the parameters of research. The data collected from the interviews is then analysed using aspectual analysis and the steps of the analysis documented. The findings and discussions of the research are then presented together with justification for certain conclusions.

This brings us to this chapter where the contributions of the research are discussed relative to the achievements of the thesis and relative to the extent at which the objectives have been met, whether the main research questions have been answered and a discussion on the limitations of the study by examining the validity of results and quality of research

parameters. Finally, future research which can be performed has been suggested showing a wide array of exciting fields where the concept of tacit knowledge, if better defined, can revolutionise research.

7.2 Whether the targets of the thesis have been met

7.2.1 To What Extent Have the Aims and Objectives Been Achieved

The first aim of the research was to create a new foundation for identifying different types of tacit knowledge: The research has achieved this aim by creating a conceptual framework that clearly sets the parameters for different types of tacit knowledge. These different types of tacit knowledge are defined as such because they have been assigned differing properties as illustrated in Chapter 3.4. This has been tested in the philosophical analysis on current literature in Chapter 3.5 and practically tested in the empirical study where the analysis shows in Chapter 5 that the separation of different forms of knowing leads to better clarity in defining which types can be observed or deduced from the interview process. The final framework in chapter 6.6 outlines how different forms of tacit knowing can be defined, while chapter 6.3 shows how different forms of tacit knowing were identified during the research. Other objectives that needed to be carried out in order to achieve this aim included carrying out a background analysis of tacit knowledge definitions, views and philosophical foundations to identify the conflicts in literature and this was shown in the literature review in Chapter 2.

The second aim of the research was to resolve the conflict in literature by unifying the differing definitions of tacit knowledge under a singular framework: This was achieved, in a similar manner to the first aim, in that the conceptual framework provided a platform from which the differing notions of tacit knowledge were catered for in the spectrum of knowing defined in Chapter 3.3 of this dissertation. A preliminary analysis in Chapter 3.5 shows how

the different author seem to mention different types of tacit knowledge while arguing that they are describing the same notion. The objectives performed for this research range from the literature review in Chapter two, giving a background on the conflict in literature, the creation of a conceptual framework inclusive of different forms of tacit knowledge in Chapter three and, finally, the testing of the conceptual framework for more robust results in Chapters 4 and 5 of this dissertation, whose findings and incremental arguments are discussed in Chapter 6 of the dissertation. In chapter 6 of the dissertation the nature of tacit knowing on whether it is individual or collective in nature has been determined, showing that some tacit knowledge is individual, some collective, and some exhibiting both individual and collective elements.

The third aim of the research was the clarification of the notion of explication of tacit knowledge: This aim was achieved by first accomplishing the first objective which was a background analysis on the nature of explication of tacit knowledge in both philosophical and practical literature. This has been performed in Chapters 2.3 and 2.4. After establishing the arguments of explication, the conceptual framework in Chapter 3 sets parameters on which types of tacit knowledge can be explicated, those that can be partially explicated and those which cannot be wholly explicated. During the analysis of the empirical data in Chapter 5, the issue of explication and which forms can be explicated is further explored and the results discussed in Chapter 6 on the state of explication while using interviews as a method of data collection. The final framework in chapter 6.6 summarises how different types of tacit knowledge can be explicated within an SME setting by following the process of aspectual analysis set out in chapter 5.2 of this dissertation.

7.2.2 Answer to the Main Research Question

The main research question asks: How can Dooyeweerd's philosophy be used to analyse the tacit knowledge held by a variety of people at an organisation thus revealing the different types of tacit knowledge and discerning which types can be explicated?

This question has been answered in the following five steps:

i.) The first relates to "Dooyeweerd philosophy": The research has created a conceptual framework guided by Dooyeweerd's philosophy that accounts for different types of tacit knowledge and sets a criteria for the levels of explication for the different types and how tacit knowledge exists at an inter-aspect "reaching out" motif (shown in Chapter 3.2) thus allowing for it to be revealed. Aspectual analysis also reliant on Dooyeweerd's modal aspects has been used to review the data gathered from the empirical study.

ii.) Tacit knowledge held by a variety of people: There are two parts to this section of the question. The first is defining what we mean by tacit knowledge as in order to identify it. The conceptual framework helps in defining the parameters of the notion of tacit knowledge based on the problems it has identified in the literature review of the research. From this point then the researcher is able to determine what constitutes tacit knowledge. The second part of this section the "variety of people at an organisation". The research domain addresses this in that personnel from a company based in Manchester are interviewed using semi-structured interviews which has been documented in Chapter 3; whereby in order to procure the "tacit knowledge from a variety of people" as the question puts it, the perceptions of those people are used as the data from which tacit knowledge will be extrapolated from.

iii.) In the next section of the question: "Be analysed in order to identify the different types of tacit knowledge". This has been answered in two parts: the first is the analysis of the empirical data from the interviews conducted has been performed using aspectual analysis,

documented in Chapter 5, as derived from the conceptual framework in Chapter 3 of the dissertation and explained in Chapter 4.8.2.

iv.) The second part of the question of “identify the different types of tacit knowledge”: the analysis shows the percentage dispersion of different forms of tacit knowledge (Chapter 5.2) and their distribution in phrases used during the interview (Chapter 5.1) to provide a platform for showing the different types of tacit knowledge as asked in the main research question.

v.) The final section of the question relates to: “discern which types can be explicated”. In extension to the answer of the previous section, Chapter 5.1 shows analysis of the possibility of explication for each phrase analysed in the different interviews. Each phrase gives a different assertion to the type of tacit knowledge that can be explicated given the context of the interview and the various assumptions made about the unspoken and spoken motivations, tacit knowledge about the statement being analysed and the tacit knowledge behind the content of the statement being analysed. This has been illustrated in detail in Chapter 5.1 of this dissertation.

When looking at the statement as a whole, the different elements it needs answered have been fulfilled by achieving all objectives set at the start of the research and provided a platform for extension in the findings of both the conceptual framework applied to current literature and those from the empirical study, both described in Chapter 6 of this dissertation.

7.3 Discussion on the Validity and Quality of the Research

This section covers the limitations of the study by discussing the validity of the results presented and the quality of the research based on the parameters set and elements which may have altered the final results presented in the thesis.

i.) Research Philosophy: The research uses a scarcely known philosophy in applying Herman Dooyeweerd's transcendental critique as the philosophical lens of approach and, due to this untested nature, the integration of already established norms of research may present inaccurate results. The research primarily uses Basden's interpretation of Dooyeweerdian thought, as the scale of Dooyeweerd's philosophy may hinder progress of research in a limited time frame. From this point of view, it may be suggested that if Basden is incorrect in his translation of Dooyeweerdian thought, then the results of this research may also be incorrect.

Basden (2010) identifies that there are two paths which we have been used to criticise Dooyeweerd's philosophy: superficial critique and substantial critique.

On superficial critiques of Dooyeweerd, these range from theological disputes with other researchers who thought that Dooyeweerdian thought was so radical that he was once accused of heresy; to a subset of criticism that reflects back more on the pre-theoretical stance of the criticiser than actual criticism of Dooyeweerd. Basden (2010) gives the example of a colleague who calls Dooyeweerd an essentialist, which is a failing to understand that Dooyeweerd reacted against an immediate impression arising from his own adherence to the Freedom pole of NFGM (explained in Chapter 4.2.5.1). Additionally, a criticism of particular importance to the research conducted here is that Dooyeweerd did not engage directly with social constructionism, which is important in applying it to a field that requires societal influences; in this case the organisational environment in which the qualitative research has been conducted.

On substantial critiques of Dooyeweerd, Klapwijk (1987) applauds Dooyeweerdian thought for making "the structure of theoretical thought transparent", but suggests that his transcendental epistemology and cosmology form a vicious circle. This is a view that may

come from the ambiguity of Dooyeweerd's writings. Further researchers such as Clouser (2005) have documented easier renditions of Dooyeweerd's transcendental critique that do not seem to show the vicious circle suggested by Klapwijk (1987) as referenced by Basden (2010). Choi (2000) suggested that Dooyeweerd's attempt at cultural critique was too abstract and theoretical and oriented mainly to the state and society than to culture. There has been very little substantive criticism of Dooyeweerd from communities of mainstream philosophy and this may stem from people wrongly assuming that because he spoke of a "Christian philosophy", then his thoughts would be irrelevant. The characteristics of mainstream philosophy plays a part in limiting interaction with Dooyeweerdian thought; and thus will struggle to immanently engage with it.

ii.) Using Interpretive research: To discuss the limitations presented by performing interpretive research, the researcher will use Klein and Myers (1999) guiding principles in conducting this research.

Klein & Myers (1999) proposed a set of principles for interpretive field research:

1. The fundamental principle of the hermeneutic circle:

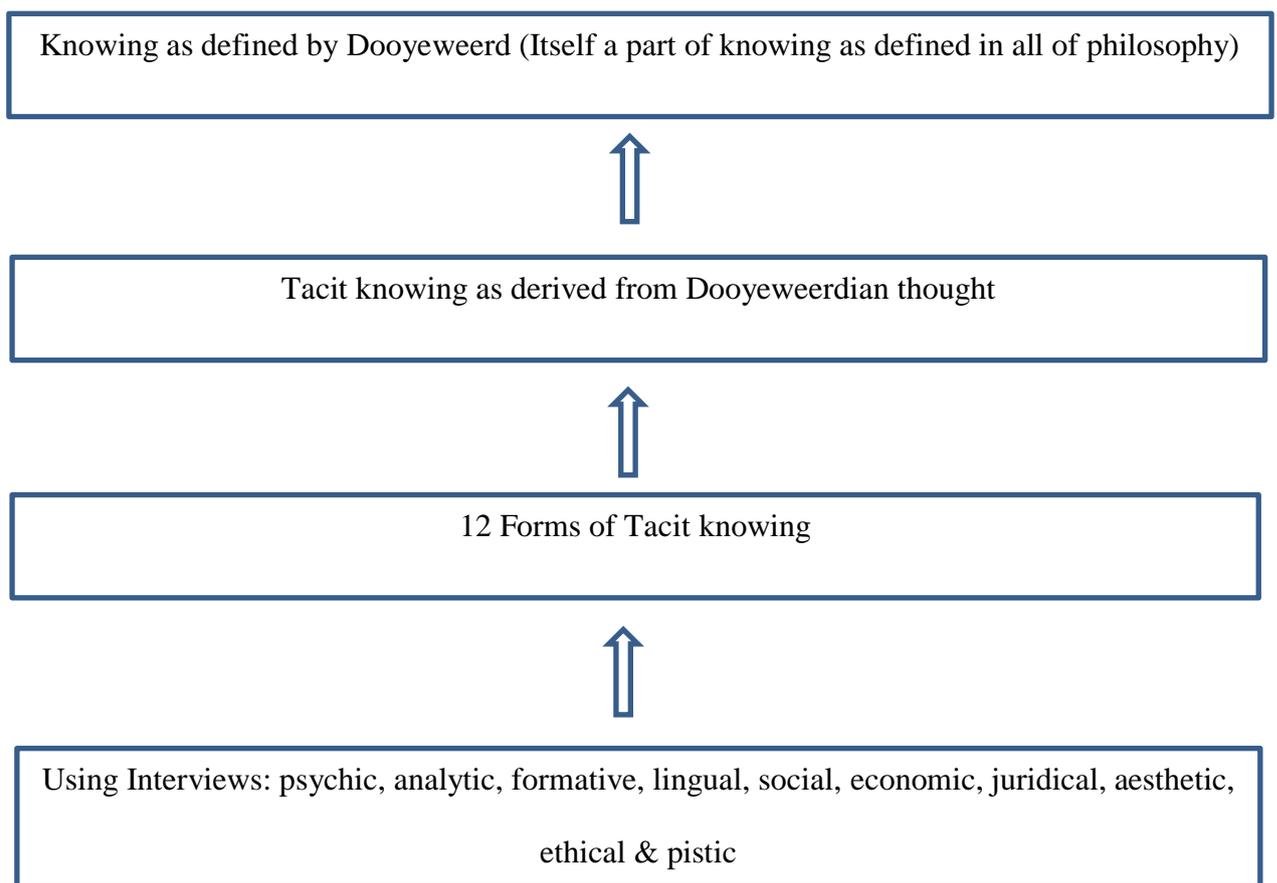
This principle suggests that all human understanding is achieved by iteration between the interdependent meanings of parts and the whole they form. Identifying the parts and the whole in an encapsulating circular relationship; whereby the whole could also be part of a larger whole is fundamental to the understanding of human interaction.

From the first principle, the researcher can identify the hermeneutics surrounding the notion of tacit knowledge being explored in relation to the notion of tacit knowledge as a whole. The tacit knowledge being explored is from a lingual aspect as interviewing is a lingual form of interaction. Thus, the limitation of research in this case is that while what can be observed is

from only interviews, and forms part of the whole of the tacit knowledge discussed in the dissertation, there exists arenas for expansion into other forms of tacit knowledge that can be explored. Results of tacit knowledge investigated from only interviews may not apply to forms of tacit knowledge investigated with other methods of data collection.

An illustration of this may be shown as:

Figure 26: Rudimentary illustration of Hermeneutic Circle



As the arrow goes further up, the more collective it becomes. The hermeneutic circle suggests that each of the boxes of the illustration above can represent part of the whole, and the whole can represent the parts. A circular relationship of using the part and the whole to represent each other.

2. The Principle of Contextualisation:

This principle suggests that the research requires a critical understanding of the social and historical settings to aid understanding of the intended audience on how the current situation under investigation developed.

The research documented in this dissertation occurs at a time when there is no clear agreement on the true nature of tacit knowledge. The three main problems identified in the literature review of identification, explication and nature of tacit knowledge, leading to varied definition of tacit knowledge, places the research at a point of trying to resolve the conflict created from these differing views. Creating a platform that accounts for different forms of tacit knowing allows the researcher to orient the research in a way that aims to reveal these differing forms of tacit knowing in the empirical research being conducted. This led the researcher to create a method for asking questions that would reveal these different forms. The intuition criteria described in section 4.6.3.2 is the result of trying to reveal these different forms of knowing. However, a possible critique of the method, although generic in its inception of creating relevant questioning platforms, is that it can also be achieved by using aspects derived from Dooyeweerd's philosophy. This can wrongly be accused of confirmation bias. As introduced in Chapter 3 of this dissertation, Dooyeweerd's philosophy suggests multi-aspectual functioning. If the researcher is using Dooyeweerd's philosophy as a lens, then even in the element of choosing a criteria for interviewing would also be bound by the laws of aspectual functioning. The intuition criteria is meant to aid the reader of this dissertation in showing how one can generate a platform for asking different questions and not necessarily say that Dooyeweerd's philosophy has informed the decision.

3. The principle of interaction between the researchers and the subjects:

This principle requires that there should be critical reflection on how the research data was socially constructed through the interaction between the researchers and participants. When taking this principle into consideration, one of the elements that questions the validity of the data collated is researcher bias. The researcher may ask leading questions unknowingly eliciting responses that are weighted towards what the researcher wanted to hear, rather than what the participant wanted to convey. As the research in the thesis primarily uses interviews, this is one of the most important elements to consider when assessing the validity of the data gathered. This brings back the issue of how the interview questions were designed relative to an intuition criteria, designed by a researcher with pre-existing knowledge of Dooyeweerd's philosophy and particularly multi-aspectual functioning. The creation of the intuition criteria can be criticised as being a derivation of Dooyeweerd's aspects; this assertion would be correct in principle since we cannot escape multi-aspectual functioning as human beings.

This distinction between a method derived independent of the aspects of human functioning and one that depends on it would create a false narrative in this case. However, creating a rudimentary criteria that can be replicated by many other paradigms of conducting research stands a better chance of being understood in the context of research as a whole.

4. The principle of abstraction and generalisation:

This principle requires relating the idiographic details revealed by the data interpretation through the application of principles one and two to theoretical, general concepts that describe the nature of human understanding and social action.

The validity of data also depends on how researchers view the fine details of the data they have gathered in their empirical study. Suppression of certain details may stem from what the

researcher considers important to them as opposed to what is important to the research itself. To borrow insight from Dooyeweerdian thinking, a researcher will be bound by finding some aspects of functioning more important than others, and thus obstruct themselves from gaining a clearer picture of the research. In this case, the researcher is aware of this factor, but cannot self-correct as he cannot take an analytical view of his own views and be completely objective; but an analysis of this subjective bias helps in reducing subjective bias of the research and thus achieves higher abstraction. This issue of subjective bias has been addressed in Chapter 4.5.2 with other forms of bias also examined.

In terms of the generalisation element in this principle, Fahrenberg (2003) underlines the necessity of generalisation, but criticises interpretive studies that are overhasty to achieve generalisation of their results. In this research, the use of a strong situational concept whereby a singular organisation has been used as the research domain is a significant limitation. This leads to assumptions that similar results would be achieved if the research is conducted in multiple organisations. This has been discussed in Chapter 7 of this dissertation relative to whether results would be significantly different in other organisations.

The second element of generalisation places emphasis on linking what is particular to each of the different elements of research to a more general concept in order to build on principles one and two of Klein & Myers platform. Interpreting different elements of the data collected from the interviews needs a general linguistic understanding of socio-cultural norms of communication. As shown in the analysis in Chapter 5, the ways to reveal to different forms of tacit knowing depend on a general interpretation of the participants speech by the researcher. The generalisation of results is achieved by taking commonly used phrases, utterances and statements and showing how they can be analysed relative to a general understanding of what unspoken or spoken motivations might be illuminated. The determination of the aspectual form of knowing can then be applied to this generalised

principle. Addressing the different levels of generalisation of results determines the levels of validity that can be achieved. Thus, creating a criteria that is able to gain the benefits of generalisation so that data can be interpreted to more general concepts in the field of research, while at the same time minimising the effects of generalisation on the quality of data analysed, would address the limitations of research arise from generalisation of results.

The last element to examine in the issue of abstraction and generalisation is how the researcher uses their theoretical lens to explain how insights are derived. The theoretical framework is derived from an interpretation of Herman Dooyeweerd's philosophy by Professor Andrew Basden. Basden's interpretation of Dooyeweerd might be flawed in application and thus the interpretation of the researcher consequentially flawed. The researcher has in turn generalised the way Dooyeweerd's philosophy can be applied to the research as being universal. This is a limitation of research that cannot be overcome when applying the philosophy created by another human being. As with most elements of philosophy, no singular or true way to interpret Dooyeweerd has been agreed in literature.

5. The principle of dialogical reasoning

This principle requires sensitivity to possible contradictions between the theoretical preconceptions guiding the research design and actual findings with subsequent cycles of revision.

The nature of this principle lies in expecting the researcher to be open to changes in their perceptions or theoretical arguments if the data collated does not support them. The proposals in Chapter 3 (conceptual framework) of how to address the issues encountered in the literature review in Chapter 2, have to be weighed with Chapter 6 (Analysis) & 7 (Discussion & Findings) of the dissertation to show whether elements suggested in Chapter 3 hold true. An example of how the researcher has been open to changes in the theoretical

framework lies in how the research had to admit that certain forms of tacit knowing, suggested in Chapter 3, could not be researched due to the nature of data collection in the empirical research. Another example is that the conceptual framework did not consider the element of linguistics in the relation between making an utterance or statement relative to what form of tacit knowledge could be identified or explicated. The issue of assessing different forms of tacit knowing as suggested by differing lenses in Chapter 3, was altered as the research showed from combining philosophical analysis of the literature and the empirical analysis of the data in Chapter 6 as a person having both tacit lenses and explicit lenses. This was a major discovery and showed the non-linear assertion that differing professions view tacit knowledge differently from each other because of placing singular importance in one aspectual lens.

6. The principle of multiple interpretations

The principle requires sensitivity to possible differences in interpretations among the participants, as are typically expressed in multiple narratives or stories of the same sequence of events under study.

This principle requires the researcher to understand the conflicts in narratives and assess the reasons behind them. In the empirical study, the researcher interviewed people from different sectors of a company and who in turn had different interpretations of similar events.

Aspectual analysis enabled the researcher to review the spoken and unspoken motivations of the different research participants. This allowed the researcher to gain insight on what forms of tacit knowing guided the decision making or interpretations of different participants. A possible limitation lies on the interpretation of the researcher of what the unspoken or spoken motivations are in relation to different events. As shown in Chapter 6, some forms of

knowing are identified by interpretations of the researcher relative to these motivations. If the interpretation is wrong, then the results of the analysis would follow suit.

One of the guiding principles of the research conducted in this dissertation is the differing views or multiple interpretations of tacit knowing. The researcher has analysed current literature and grouped the different authors into categories which the researcher interprets as being appropriate to each of the authors. This grouping of differing views into categories may also be a limitation as it may conceal other works or views that the author being reviewed has on the subject matter. An example of this scenario was encountered while researching Michael Polanyi's views on tacit knowing. Most of the authors were too focused on the phrase: "we know more than we can tell" and similar locutions of complex arguments foregoing the entanglement faced in the research. A complex dissemination of Polanyi shows that he held multiple views on the nature of knowledge and the researcher of this dissertation was illuminated to the fact that when he talks about tacit knowledge, he is talking about the process of knowing. This is lost to most researchers because a general misinformed understanding of Polanyi's body of work exists. This scenario shows that the researcher of this thesis may be misinformed on some of the views of the authors, covered in the literature review, due to the obscuration of certain parts of their research since the author of this dissertation may have not covered them.

Scope of dissertation: While reviewing the principle of multiple interpretations, it is also important to discuss the scope of this research and how it has conducted a review of tacit knowledge. The interpretation of this researcher is that there are three main areas to review when assessing tacit knowledge: The nature of tacit knowledge that leads to a variety of definitions of tacit knowledge, the explication of tacit knowledge and, finally, the identification of tacit knowledge. The researcher believes that the arena of tacit knowledge can be improved if these areas of research can be redressed. However, this is the

interpretation of the researcher and, as such, some areas of tacit knowledge may not be covered while viewing the whole discussion of tacit knowledge in these terms. This is a limitation of the study on how the author interprets the main problems faced with the research field. Obscuration of important areas may occur due the method of problem identification that the author has decided to use. One of these areas that was not covered is the nature of knowledge and conceptual frameworks that have been used in research to account for tacit knowledge. The researcher determined that the scope of this dissertation would be altered if huge philosophical arguments are included on the nature of knowledge in philosophy and how they account for tacit knowledge. However, while assessing how Dooyeweerd's philosophy defines knowledge, there needed to be a way of linking interpretive paradigms to the scarcely researched philosophy of Herman Dooyeweerd. This investigation led to the most rudimentary definitions of knowledge with emphasis on that which is implicit. This is an investigation that the researcher thinks would have been useful to explore since it would provide the platform for greater linking of already mainstream philosophies and paradigms of research with Dooyeweerd philosophy, and thus greater cohesion could occur between multiple conceptual frameworks accounting for tacit knowledge.

7. The principle of suspicion

This principle requires sensitivity to possible biases and systematic distortions in the narratives collected from the participants.

This principle is primarily concerned with the bias presented from the research participants who provide the central data to be analysed. This research's primary data mainly depends on the perceptions of a workforce based at an SME in Manchester. The nature of an SME is that the employees do not want to offset the fragile balance of cohesion achieved working closely with most people in the organisation. From this standpoint, some of the answers given during

interviews might not be true as the employees would not want to antagonise the status quo. The researcher must thus be suspicious of such participant bias and attempt to aggregate results from all the interviews as a whole; while making sure to account for anomalies that may arise. This is an area of research bias that may have an effect on the validity and quality of results obtained in the analysis and consequently the conclusions made from the analysis. The research attempts to address this by analysing the spoken and unspoken motivations of different participants within the company; and creating tables to see if the results of some are at odds with others. When mapping different forms of tacit knowing identified in each of the major sections of the analysis in Chapter 6, if a number of the variables appear to be outside the spectrum of what most of the other results from different interviews point to, then the researcher has to place suspicion on that result whilst also formulating other conclusions that lead to a differing stance from what was expected. This may be one way of mitigating the bias caused by research participants, but it is not robust enough to mitigate the faulty results.

iii.) Sample Criteria and Size used in research:

Discussed in section 4.5 of this dissertation the criteria used to determine which research participants should be interviewed for was determined by a number of sampling methods, determination of sample frames to be utilised and determination by the researcher when the data saturation was achieved. The different drawbacks that of the various stages of determination by the researcher may hinder the validity of the research. For example: what if the researcher missed a crucial sample from the organisation of research and thus missed the data that could have been utilised in the analysis? The determination of data saturation is also crucial, but if the researcher determines this wrongly, then the validity of the results would also be put to question. The process of selecting which participants will be used in research presents a fundamental stage in determining the quality and validity of data to be collated for the empirical study. Thus, if any element of this stage is not evaluated correctly then the

research will suffer in quality and validity. There is also the element of selecting the questions from different interviews which the researcher determines contains the richest data to be analysed. This determination may eliminate results from other questions which would otherwise generate different data. However, it should be noted that the intensity of the analysis of each of the singular questions of the different interviews determined that there would be limited value in analysing every single answer of each interview in the research.

iv.) Strong situational concept:

The use of one organisation as the primary domain of study is a limitation due two major factors:

- Inter related issues of methodological rigour: There are concerns that the reliability and replicability of various forms used on this singular organisation may be lacking.
- External validity or generalisability: This is the most prominent critique of using a singular organisation for the study. The researcher has to ask the question: “How is it that one case can reliably offer anything beyond the particular?” This is an unavoidably valid critique of this research.

The researcher has thus decided to perform a speculative review of how the analysis used in this organisation domain may apply to another organisation based in his home country, Kenya, and one that uses the language Swahili as the primary form of communication and the researcher speculates that:

1. The tacit knowledge about the statement: This would be similar to the study as it relates to understanding the language constructs of a different culture that the researcher would be able to discern.

2. The tacit knowledge behind the content of the statement: This will be a major difference because of the meaning placed on different terms of a different language; and also the cultural differences that shows shared knowledge or commonality of certain issues. The researcher speculates that this would be the only area of the research that would alter if the research is conducted in an area with a different culture.
3. Spoken motivations; the tacit knowledge discerned from this would be similar in kind to that discerned in the research of this dissertation.
4. Unspoken motivations: the tacit knowledge discerned from this would be similar in kind to that discerned in the research of this dissertation.
5. Can it be explicated: this would be dependent upon the unspoken and spoken motivations and the researcher speculates that the data would behave in a similar way to that of the current research.

Although the limitations encountered by having a singular organisation of study are serious to the validity and quality of the data, the researcher believes that only certain elements of the analysis of data would change the results and thus is confident that the research can be replicated and generalisations made about the nature of tacit knowing.

v.) Use of Interviews only

One of the limitations of this study is the use of interviews as the primary source of data collection. This has resulted in only a partial investigation into the different types of tacit knowledge that exist. Using interviews limits the researcher to only researching tacit knowing types from formative to pistic (refer to Chapter 3 for definitions), as opposed to from physical tacit knowing to pistic tacit knowing. The different elements of research bias have been explored in Chapter 4.5.2 and show how this might affect the validity of data.

Apart from this element of that explores the drawbacks of using interviews, there is also the element of using other forms of data collection not explored that could have been useful in illuminating different areas of interest on the phenomenon of tacit knowledge.

Tacit knowledge explored by the use of observation: The researcher speculates that observation would aid in exploring analytical tacit knowing. This follows from the researcher's exploration of literature on Collin's sapphire study and Nonaka's Knowledge creating company both of which provide cases of analytical tacit knowing.

Tacit knowledge explored by the use of eye tracking technology: The use of eye tracking technology might be able to discern physical and biotic tacit knowing.

Tacit knowledge explored by use of focus groups: Focus groups may be used to discern different notions of tacit knowing on elements such as psychic and formative tacit knowing could be explored by creating tasks for the research participants to accomplish and documenting the resulting data on how each of the research participants approach the task at hand.

7.4 Contributions

In order to aid in the better understanding of tacit knowledge, this research has addressed three main problem areas in literature: The nature of tacit knowledge; the explicability of tacit knowledge and the identification of tacit knowledge; all of which contribute to multiple definitions of tacit knowledge thus creating conflict in literature. This dissertation has thus contributed to literature in the following ways:

7.4.1 Contribution to Theory of Tacit Knowledge

The research performed a review of both philosophical and practical literature of tacit knowledge. This review showed that there is no agreed foundation for defining tacit knowledge, nor an agreement on how it can be identified or explicated. This thesis has showed the problematic areas in tacit knowledge conversations; and provided a theoretical framework to solve these issues in Chapter 3 of this dissertation. This theoretical framework has then been tested with the parameters set in Chapter 4 and the analysis in Chapter 5 and, finally, presented new tested ways of viewing tacit knowing in Chapter 6. Both the theoretical framework and the tested framework have provided a possible solution to the problems faced in tacit knowledge literature. This creation of a new foundation for viewing tacit knowing is a major contribution of this research to the theory of tacit knowledge.

The first element of this contribution is first showing the nature of the different forms of tacit knowledge as in chapter 6.2.1 which shows how tacit knowing can be separated into forms of tacit knowing that are individually held, those that are collectively held and finally those that have both individual and collective traits. This is one of the main conflicts in literature that this solution aims to have aided in resolution.

The second element of this contribution is to determine the levels of explicability of the different forms of tacit knowing identified. It has set a platform on how to approach the different forms of tacit knowing within a framework that sets the conditions for which each form of tacit knowing can be explicated.

7.4.2 Contribution to the Practical Research of Tacit Knowledge

Practical studies into tacit knowledge have suffered due to the poorly defined nature of tacit knowledge. Ranging from knowledge and organisational management frameworks to psychological and artificial intelligence fields of research; the way in which tacit knowledge is accounted for has been relatively poor due to the frayed discourse in foundations for tacit knowledge. The research has provided a platform whereby different forms of tacit knowing can be researched and conflicts in the nature of tacit knowing alleviated. For example: Organisational frameworks may be mostly concerned with exploring formative knowing as opposed to psychic knowing which would be the purview of psychological research. However, it can be argued that the foundation created in this research can aid both of these examples of organisational and psychological research to review the whole spectrum of different forms of knowing to their benefit. Assigning type to different forms of tacit knowing will enhance research in a variety of fields who deal with the study of knowledge patterns and flows. Ensuring that different fields that perform practical research into tacit knowledge are able to distinguish between different forms of tacit knowledge and thus aiding better research is a major contribution of this research.

Another element of this contribution is the separation of identifying the tacit knowledge in use within the interview setting and the tacit knowledge behind the content of the interviewee's data. It shows how Dooyeweerd's theory of knowing assertion that the knower is part of what is known can be applied to a research setting to gain richer data.

7.4.3 Contribution to the Practice of Explicating Tacit Knowledge

The tested results of the theoretical framework show that some forms of tacit knowledge can be explicated. As shown in Chapters 6 & 7 of this dissertation, the possible range of tacit knowing that can be illuminated when conducting aspectual analysis on interview excerpts covers tacit knowing from formative to pistic aspects of knowing. The levels of explication

have also been determined as the graph in Chapter 6.3.3 shows that explication was possible for all forms of tacit knowing investigated in this research except for ethical and lingual tacit knowing. These two forms of knowing, as defined in this research, can aid researchers in determining which forms of tacit knowing can be explicated and those which cannot. The foundation for assessing the levels of explication for each form of tacit knowing, as illustrated and described in section 6.3.3, gives a platform from which researchers will be able to design frameworks that explicate the forms of knowing detailed in this research as being explicable. The contribution of this research was to determine which types of tacit knowledge can be explicated and to what levels. This will greatly help research areas that are primarily looking for ways to explicate tacit knowledge. This contribution is different from 7.4.2 because it gives a platform for researchers not only to determine different tacit knowledge types, but also to be able to create frameworks for those that can be explicated.

7.4.4 Contribution to Methodology in the Testing of Inter-Aspect “Reaching Out”

Due to the scarce nature of research that exists in using Dooyeweerdian theoretical tools to tackle research areas, it is important that as more research is performed using this philosophy, contributions to using the tools is extended. One of the elements that has been used to aid and extended aspectual analysis is how inter-aspect “reaching out” can be applied in order to reveal what form of tacit knowledge exists in TKS, TKC, Spoken motivations, Unspoken motivations and what can be explicated (see Chapter 5.2 and chapter 6.).

Inter-aspect reaching out can be surmised as each aspect containing the reverberations of all the others. Inter-aspect reaching out has yet to be tested before within research settings and this thesis has provided a platform on how to utilise one of the less explored properties of modal aspects in literature.

7.5 Further Research

There are interesting areas of extension of research into tacit knowledge that this research could not accomplish that would further illuminate this interesting phenomenon. Below are ways in which the research could be extended:

7.5.1 Multiple Data Collection Methods

The first element that could extend the research is using multiple methods to empirical data to analyse. This research has only used interviews which has limited that number of types of tacit knowledge that could be explored. Testing the theoretical framework in full by eliciting different ways of collecting research data could help illuminate different types of tacit knowledge. In addition, the inter-aspect “reaching out” factor discussed in Chapter 3 could make it possible that an even wider range of the twelve forms of tacit knowing could be explored. Use of methods such as observation of different groups at work; separating people of different lengths of experience in expertise on certain fields could yield fruitful results. Going even further into the neuroscience field whereby, as mentioned in Chapter 4, brain mapping in order to know how knowledge is stored in relation to neuro pathway mapping could be an interesting development in determining the constitution of tacit knowing. Another field of interest is expanding the work of Watanabe et. al., (2010) in the use of eye tracking interfaces to determine how knowledge conversion occurs; and append the use of aspectual knowing to their experiments. All these different methods of data collection in conjunction with a Dooyeweerdian framework would greatly expound the field of tacit knowledge.

7.5.2 Overcoming limitations of the current Research

Another useful extension of research would be to attempt to overcome the limitations of current research. This could be achieved by:

i.) Determining if the experiment could be replicated over multiple organisations, not only in the United Kingdom or Europe, but across the globe. How would data from similar organisations in different organisations across the world be different when using the aspectual analysis performed in this research? A suggestion of how the results would vary have been suggested in Chapter 6 of this dissertation.

ii.) Greater examination of both philosophical and practical literature of tacit knowledge. This is especially concerned with reviewing different conceptual frameworks of tacit knowledge and how they have been tested to contribute to literature and the practical research fields.

7.5.3 Tacit & Explicit Lenses

The researcher has determined that the way in which he has separated the different views of authors of tacit knowing, in relation to how they perceive tacit knowing, may be extended to include an analysis of their tacit and explicit lenses. For example, in the case of psychologists, the primary research lens that they approach research rely by placing great importance to psychic tacit knowing. However, once you review the research conducted you find multiple forms of tacit knowing being discussed. In this scenario psychic tacit knowing, being their primary research element of research, is then determined by the explicit lens. On the other hand the other elements of importance in knowing that one is able to extract from their writings are determined by their tacit lenses. Without going into the discussion of free will and the nature of man, this is an area that can be explored to determine whether we consolidate the world around us with both tacit and explicit lenses thus determining our actions. Question for thought: without performing aspectual analysis, determining the spoken

and unspoken motivations with contextual framing of the phrase “Actions speak louder than words” then could it be that action is determined by our tacit lens of the world and the “words” part is determined by our explicit lens? An interesting thought in the world of tacit knowledge that the researcher hopes can be explored in the near future.

7.6 Conclusion

This research has created a new framework for determining the different types of tacit knowledge, expounded on the nature of tacit knowledge, provided a platform for showing how different forms of tacit knowledge can be identified and ultimately explicated. The vast field of research into knowledge requires immanent amalgamation of different conceptual frameworks of knowledge that encompasses tacit knowledge. It is a field that the researcher hopes to have made clearer by assigning types, determining levels of explication and extended the map of the nature of tacit knowing. It is the hope of this author that this research provides a platform from which aesthetic cohesion could be achieved in the exploration of tacit knowledge.

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APPENDIX

(Note the evolution of the title of research from: An organisational approach into
Tacit Knowledge to the current title.)

PARTICIPANT INFORMATION SHEET

An Organisational Approach into Tacit Knowledge

The purpose of this document is to act as an information overview platform for the type of research into which the participants will be involved. This study entails the exploration of tacit knowledge as analysed from the perceptions of individuals working in the same organisation. There are two types of knowledge: Explicit and Tacit Knowledge. This study focuses on **tacit knowledge which is knowledge that cannot be easily explained**.

The document will provide the essential information pertaining to the research; thus better informing the participants as to whether they would like to participate in the research. The participant can request any additional information from the researcher or the project supervisors whose details are located at the end of this form.

Why have I been invited to participate in this research?

As a member of your organisation, you live within a knowledge environment that is rich in tacit knowledge. The knowledge flow within your company encompasses both your individual tacit knowledge and the tacit knowledge held collectively within the organisation.

Do I have to take part in the research?

Your participation is fully voluntary and only carried out with your direct consent.

What will happen if I decide to take part in the research?

At first, you will be asked to sign a consent form. Then you will be interviewed and recorded while answering the researcher's questions at your discretion. The interviews can be any length of time you are willing to provide, but as a guideline should be no longer than 30 minutes in length.

What is the research's policy in terms of confidentiality?

All information collected during the research will remain confidential and secure. In terms of individual interview data security, none of the data collated from the research shall mention any participant by name when documenting the research in either the dissertation report or any academic publications. Finally, all data collated from the research that is held in electronic devices shall only be accessible by the academic supervisors and the primary researcher.

Are there any risks involved in the participation of the research?

The research does not have any known risks or hazards to both mental and physical wellbeing of the research participants

What are the possible benefits of taking part?

The researcher is analysing the different types of tacit knowledge. It would be interesting to the participant to find out what sort of tacit knowledge they hold both individually and within the company. The research may also provide pathways to identifying arenas usually ignored when fostering organisational learning.

What will happen after the data from interviews has been collected?

The data from the interviews will be analysed by the researcher and utilised in the PhD thesis which will be primarily held in both hard and soft copy formats at the University of Salford's library. The research data may also be used as a platform for publishing academic papers on the title subject of tacit knowledge.

Further Information & Contact Details

Further information about the University of Salford's Post Graduate research programme can be found in the following web address:

<http://www.salford.ac.uk/research>

In regards to this research, additional information can be obtained from the researcher and supervisors as shown below:

Researcher	Supervisor	Co-Supervisor
Alex Gachuhi Kimani	Dr. Suzanne Kane	Prof. Andrew Basden
Maxwell 926 Salford Business School University of Salford Salford Greater Manchester M5 4WT	Maxwell 608a Salford Business School University of Salford Salford Greater Manchester M5 4WT	Maxwell 304 Salford Business School University of Salford Salford Greater Manchester M5 4WT
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RESEARCH PARTICIPANT CONSENT FORM

Research Title: An Organisational Approach into Tacit Knowledge

Researcher: Alex Gachuhi Kimani

The purpose of this document is to gain the participant's consent if they are considering taking part in the research. This research aims to find a way of identifying tacit knowledge through the analysis of perceptions collated through interviews of individuals at an organisation. Thank you for your consideration. For your assurance, please fill in the form as indicated. (Please tick to confirm on each section)

- I confirm that I have read and understood the participant information sheet for the above study and have been given the opportunity to ask questions which have been clarified.

- I agree to take part in the interview and have given my permission to be recorded

- I understand that my participation is fully voluntary and that I can **withdraw** from the research at any time **without giving any reason**

- I understand how the researcher will use my responses, who will see them and how the data will be stored.

- **I agree to take part in the above study**

Name of participant

Signature Date.....

WITHDRAWAL REQUEST FORM

Research Title: An Organisational Approach into Tacit Knowledge

I wish to withdraw from the research (Please Tick To Confirm)

I request that all data or quotations which I have provided to be removed
and discarded from the research. (Please Tick To Confirm)

Name

Date

Signature