CHAPTER 5: DETERMINING THE VALUE OF KNOWLEDGE MANAGEMENT

5.1 Introduction

The previous chapter concluded with a proposition concerning an evolutionary methodology in respect of the progression of knowledge management maturity within an organizational setting. However, in the quest to find out whether efficient and effective knowledge management does indeed lead to organizational growth, profitability and sustainability, knowledge management must be aligned with criteria that determine the overall success of an organization. Whatever the level of maturity reached, in order to justify investment in knowledge management, organizations still need to determine if investment in any of these endeavours is adding real value to the organization, i.e. knowledge management must be brought into context with the objectives and measures that determine the overall efficiency and effectiveness of the enterprise.

5.1.1 Aim

This aim of this chapter is therefore to relate knowledge management's performance to the objectives and measures that determine the overall efficiency and effectiveness of an organization.

5.1.2 Scope

In order to achieve the above-mentioned aim, emphasis is placed on:

- Knowledge management in relation to business strategy and innovation.

- Criteria to determine the efficiency and effectiveness of an organization.

- How to assess the efficiency and effectiveness of knowledge management from an organizational perspective.

- Finally, all facts, arguments and findings made with regard to determining the value of knowledge management in an organizational setting, are brought into relation with knowledge management maturity.

5.2 Knowledge management in relation to business strategy and innovation

In Chapter 2 (section 2.4), it was argued that when organizations deliberately use knowledge to change the future in the most favourable manner in the shortest time possible, the transformation of data into information into knowledge becomes more than just a process of natural evolution - it becomes a deliberate enabling process. Bater (1999), phrases this deliberate attempt to manage knowledge as the quest to determine the precise points at which knowledge injects most value into the organization. As argued, determining the exact points at which knowledge, skills and information inject their greatest value into the organization requires that the management of knowledge be brought into relation with strategy formulation. In following the same line of reasoning, authors such as Zack (1999), and Snyman and Kruger (2004) propose that knowledge management and strategy formulation are interdependent. Zack (1999) argues that the power of knowledge management does not only reside in the ability to positively influence strategy formulation (i.e. knowledge exploration leading to innovative ideas), but also, and just as importantly, in the ability to exploit the power of knowledge via strategy formulation. In agreement with this, Tiwana (2000) says that the process of knowledge driving strategy, and strategy in turn driving knowledge management, should be deliberate and well executed.

As far back as the sixties authors such as Chandler (1962) emphasised that strategy just for the sake of it, means nothing. Strategy must lead to something, and this something is some form of innovation. Weyrich (1998:01), in arguing the meaning of innovation, comes to the conclusion that innovation is everything the outside world perceives as output; 'New products and systems, new technologies and services. In short, everything the outside world perceives as a company's output'. The above-mentioned line of reasoning seems to have led to the notion that the value of strategy is encapsulated within

some form of innovation. In following this line of reasoning, the question arises whether knowledge management (being the enabler of strategy) is also the enabler of innovation. According to Leonard-Barton (1995) and Carneiro (2000:01), innovation depends on knowledge, and especially the evolution of knowledge, e.g. building new knowledge on existing knowledge. Authors such as Zack (1999), Tiwana (2000) and Murray (2000) agree, stating that knowledge is the only source of innovation and sustainable competitive advantage. However, Weyrich (1998) argues that although innovation is built on knowledge (clear vision, quality of planning, clear strategic direction) innovation is not a flash of genius; but a deliberate process that must be managed, i.e. in an organizational context it is knowledge management and not knowledge *per se* that drives innovation. As argued in Chapter 2 (section 2.4), Carneiro (2000); Dove (1999); and Nonaka and Takeuchi (1995), as cited by Darroch and McNaughton (2002) are therefore all of the opinion that knowledge management as a managerial entity is emerging as the antecedent of innovation.

Darroch and McNaughton (2002), however, warn that literature is yet to provide empirical evidence linking knowledge management to innovation. In defending the above-mentioned proposition, following an extensive search of literature dealing with innovation, Darroch and McNaughton, (2002:02) came to the conclusion that the 'relationship between knowledge management and innovation is not well understood' (arguably because the relationship between knowledge management and strategy formulation is not well understood). According to these authors there is convincing empirical evidence in literature that knowledge acquisition and spending money on R&D will positively affect innovation (Cooper, 1979; Li and Calantone, 1998; Tang, 1999; Lynn, Reilly and Akgun, 2000, quoted in Darroch and McNaughton, 2002). However, there also seems to be mixed evidence of a link between dissemination and responsiveness to knowledge and innovation (Abbey, 1983; Amabile et al, 1996, Anderson and West, 1996, Hurley and Hult, 1998; Kitchell, 1995; Tang, 1999). In arguing the reasons behind these phenomena, Darroch and McNaughton, (2002:03) come to the conclusion that discrepancies arose not only as a result of a lack of 'research linking knowledge management with innovation, but also due to studies failing to

account for different types of innovation'. Darroch and McNaughton (2002) therefore propose that research attempting to relate knowledge management to innovation needs to focus on linking knowledge management to both incremental and radical (technological) innovation. Based on the above-mentioned proposition, and drawing heavily on some of their earlier work (Darroch and McNaughton, 2001), Darroch and McNaughton (2002) propose the following hypotheses:

- Knowledge management processes positively affect innovation.

- Some knowledge management processes are more important than others for different types of innovation. More specifically:

  - Managing knowledge about the marketplace has a stronger positive effect on incremental innovation.

  - Managing science-based knowledge has a stronger positive effect on innovations that change consumer's behaviour or destroy business competencies.

As indicated in Chapter 4 (section 4.3), in order to test the above-mentioned hypothesis, using data collected from 443 New Zealand firms, a knowledge management instrument that comprises three components and 17 factors was tested against a three-factor innovation scale[46]. In part the results obtained, as quoted in the work of Darroch and McNaughton (2002:216), were 'shocking'. These authors found that: 'all innovations require flexible and opportunistic organizations; most firms develop incremental innovations, followed by innovations that change consumer's behaviour and then innovations that destroy business competencies; no informal or formal knowledge dissemination factors were found to directly affect innovation; knowledge management did not prove a sufficient explanation of innovations that destroy business competencies;

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[46] Darroch and McNaughton's (2002:115) scale to measure innovation: 'accounts for innovation that is incremental in nature, innovation that changes consumer' behaviour, both new-to-the-world and new-to-the-firm innovations that have the potential to destroy existing competencies'.

and only six of the sixteen knowledge management practices[47] were positively affecting innovation'. Interestingly enough these authors also found that one of the factors (having a well-developed financial reporting system) even had a negative effect on innovation. In essence, nine factors were found not to be significant enough to predict any form of innovation[48]. Darroch and McNaughton (2002) therefore contest earlier claims and propose that there is insufficient evidence to conclude that knowledge management processes do indeed lead to innovation; only weak support for the theory that managing knowledge about the marketplace will have a stronger effect on incremental innovation; and only partial support for concluding that managing science-based knowledge will have such a strong positive effect on innovation that it will change the consumer's behaviour or destroy competencies.

According to Darroch and McNaughton (2002), the results of their research in a sense refute previously held assumptions about the importance of knowledge dissemination practice for innovation (as proposed by Nonaka and Takeuchi, 1995), and show that knowledge acquisition and spending money on R&D are more important to innovation than knowledge dissemination. However, although knowledge dissemination, knowledge acquisition and spending money on R&D all relate to strategies to explore knowledge,

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[47] 'This research showed that six out of 13 [sic - must be 17] factors positively affected innovation:
- Being sensitive to information about changes in the marketplace
- Employing and retaining a large number of people trained in science, engineering or mathematics (having a science and technology human capital profile).
- Working in partnership with international customers.
- Using technology such as teleconferencing, videoconferencing and groupware to facilitate communication.
- Responding to knowledge about technology.
- Being flexible and opportunistic.

Darroch and McNaughton's (2002:217)

[48] A total of nine factors were not significant predictors of innovation:
- Valuing employee's attitudes and opinions.
- Getting information from market surveys.
- Freely disseminating market information.
- Disseminating knowledge on-the-job.
- Using techniques such as quality circles, mentoring and coaching.
- Preferring written communication to disseminate knowledge.
- Responding to knowledge about customers
- Responding to technology about competitors.
- Having a well-developed marketing function'

Darroch and McNaughton's (2002:217)

they all differ with regard to the end product produced. The end product of strategies to acquire knowledge is normally encapsulated in something tangible (a report, a document, etc.), leading to something tangible (some form of innovation), whereas the end products of strategies to disseminate knowledge for the most part remain intangible (disseminated knowledge for the most part simply stays in the heads of the members of the targeted audience). What is of major importance is that Darroch and McNaughton (2002:217) acknowledge this phenomenon and argue that: 'this does not mean that knowledge dissemination practice should be deemed unimportant. What is more plausible is that knowledge dissemination becomes part of the strategic architecture of a firm and provides indirect support to outcomes such as innovation'. The research conducted by Darroch and McNaughton (2002), although aimed at proving a relationship between knowledge management and innovation, in the end, ended up emphasizing the interdependency between knowledge management, business and strategy. Like the notion by Zack (1999) that the power of knowledge management does not only reside in the ability to positively influence strategy but also in the ability (via strategy formulation) to exploit the power of knowledge, the findings of Darroch and McNaughton (2002) prove that certain endeavours in knowledge management (exploration leading to exploitation via the strategic management process), lead to something tangible (innovation), while others only provide indirect support to outcomes such as innovation, for the most part continuing to be part and parcel of the strategic architecture of the organization, arguably remaining intangible. Speculating on the managerial implications of their research, these authors (Darroch and McNaughton, 2002:217) proposed that: 'Firms need to strike a balance and develop some incremental and some radical innovations – the former meet immediate market needs, while the latter preserve the future'. It would seem that the study conducted by Darroch and McNaughton (2002) in a sense negates the assumption of perfect order, or stated differently, in relating endeavours in knowledge management to different forms of innovation, Darroch and McNaughton proved that there is not necessarily a direct relationship between cause (knowledge management) and effect (innovation). This proposition is therefore similar to the statement by Kurtz and Snowden (2003:03), questioning the 'universality of basic assumptions'. These authors argue that: 'What all of these approaches and perceptions do not accept is that there are situations in

which the lack of order is not a matter of poor investigation, inadequate resources or lack of understanding, but is *a priori* in the case – and not necessarily a bad thing, either'. In essence what Darroch and McNaughton (2002) emphasize is that in order to ensure innovative output, different processes (or strategies - as proposed by Zack (1999) and Snyman and Kruger, (2004) need to be institutionalized, some cyclical in nature addressing a strategic perspective (arguably negating a direct relationship between cause and effect), and some relating more to an innovative perspective (arguably providing a direct relationship between cause and effect).

The conclusion reached by Darroch and McNaughton (2002), is therefore similar to the findings of earlier research conducted by Zack (1999). Zack suggests that knowledge exploitation and exploration are not mutually exclusive, and the ideal state would be to maintain a balance between knowledge exploitation and exploration (refer to Figure 5.1). In defending this proposition, Zack (1999:133) argues that: 'exploration provides the knowledge capital to propel the company into new niches while maintaining the viability of existing ones, while exploitation of knowledge provides the financial capital to fuel successive rounds of innovation and exploration'.

Figure 5.1:   The interdependency between knowledge exploration and knowledge exploitation
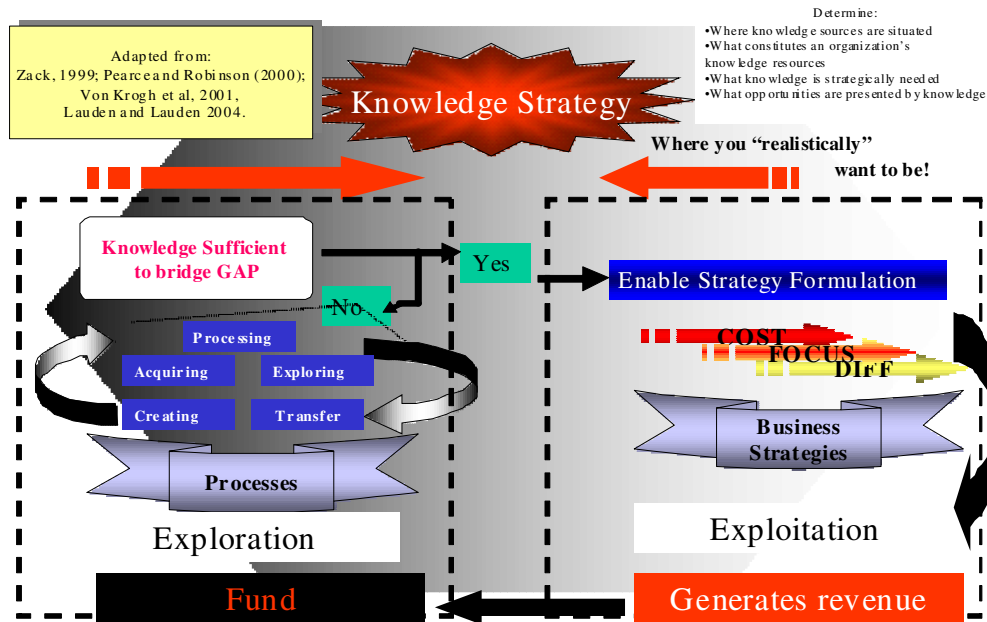
Zack (1999:133), however, adds another dimension to this line of reasoning and stresses that: 'exploration without exploitation cannot be economically sustained in the long run unless it is subsidized or directly generating a revenue stream'. Zack (1999) therefore maintains that in order to be of value, endeavours in knowledge management must in the long run lead to profitability. In agreement with the statement made by Zack (1999), Ndlela and du Toit (2001) suggest that for knowledge management to be of value, it should help to decrease cost or increase revenue. In a sense what these authors are proposing is that in assessing the value of knowledge management, all endeavours must be brought into context with the organizational quest to sustain profitability.

Ndlela and du Toit (2001), however, in following the line of reasoning that certain endeavours in knowledge management lead to something tangible, while others in support of such endeavours remain intangible, argue that in assessing the value of knowledge management both these entities must be taken into account. In their argument Ndlela and du Toit (2001), specifically emphasise the value of 'intangible knowledge' in creating business value. In a similar fashion Gallager and Hazlett (2004) maintain that in

order to justify expenditure on knowledge management, an integrated approach is needed, an approach to ensure that the right things are done at the right time, for the right reasons, in the most effective manner possible. The arguments advanced by Ndlela and du Toit (2001), and Gallager and Hazlett (2004), are therefore similar to propositions made earlier by Scheraga (1998). Building primarily on the work of Seemann (1996), Scheraga (1998) is emphasising that all endeavours in knowledge management must be measured in both a qualitative (and tangible), and quantitative[49] manner. It is therefore argued that the same practices that are used to determine the value of other parts of the business should also be employed to determine the value of knowledge management. Arguably, if the above-mentioned propositions are summarised, the conclusion would be similar to a proposition made by Ndlela and du Toit (2001), suggesting that in order to determine whether or not endeavours in knowledge management are worthwhile, their performance should be compared with the objectives and measures that determine the overall efficiency and effectiveness of the enterprise.

5.3   Criteria to determine the efficiency and effectiveness of an organization

According to Pearce and Robinson (2005), one of the most important yardsticks for assessing the efficiency and effectiveness of an organization within its industry is financial analysis. These authors are of the opinion that in the quest to determine the profitability of an organization, emphasis should be placed on financial ratios that determine how effectively the total organization is being managed. In order to assist in such endeavours, Pearce and Robinson (2005) assert that the Du Pont system of financial analysis has proved to be of great value. However, Pearce and Robinson warn that in assessing the performance of a firm, not only should financial ratios be scrutinized to determine whether there is improvement or deterioration in the firm's performance over time, but such ratios should also be compared with the financial condition of similar firms. Pearce and Robinson (2005) therefore feel that only if ratios are brought into relation with industry averages over the same period of time, can sufficient insight be gained into the firm's relative financial condition and performance. Pearce and Robinson,

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[49] Arguably qualitative measurement can be of a tangible or even an intangible nature.

like Scheraga (1998) who says that managerial endeavours[50] must be measured both in qualitative (or tangible), and quantitative (tangible and intangible) ways, argue that even though financial ratios supply insight into the profitability of a firm, in order to assess the total performance of a firm, soft and other intangible issues must also be taken into account.

In Chapter 2 (section 2.4) it was argued that the goal of all organizations is to supply stakeholders with value continuously. The performance of a firm should therefore be correlated with the satisfaction of stakeholders, especially if the firm intends to survive for a number of years. As stated in Chapter 2 (section 2.4) shareholders/owners are not the only stakeholders of an organization, and Pearce and Robinson (2000, 2005) rightly argue that the value of a firm cannot only be assessed as a derivative of financial ratios (i.e. tangible criteria primarily focusing on the needs of shareholders). However, it can be argued that whatever strategy is decided upon to satisfy the needs of stakeholders, it always boils down to an attempt to grow (internally as well as externally) and/or transform input into output in an effective and efficient manner. Unfortunately, according to Pearce and Robinson (2000), assessing growth[51] is not an easy task. The problem that arises is that organizational growth has both implicit and explicit dimensions that need to be addressed. Pearce and Robinson (2005) are therefore of the opinion that certain types of growth are extremely difficult (if not impossible) to determine[52].

In challenging the universality of basic assumptions with regard to organizational knowledge exchange, decision making, strategy and policy making, Kurtz and Snowden (2003) add yet another dimension to the line of reasoning by arguing that the prevailing

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[50] Scheraga (1998) specifically focused on managerial endeavours with regard to knowledge management.

[51] Growth. 'In this context, the meaning of growth must be broadly defined. Although the product impact market studies have shown that growth in market share is correlated with profitability, other important forms of growth do exist. Growth in the number of markets served, in the variety of products offered, and in the technologies that are used to provide goods and services frequently lead to improvement in a firm's competitive ability. Growth means change, and proactive change is essential in a dynamic business environment' (Pearce and Robinson 2000:32).

[52] A word of caution. It is not the author's intention to refrain from trying to determine the value knowledge management adds to organizational growth. However, it is emphasised that whatever criteria are used, such criteria will never be able to fully address all intangible issues, primarily due to the fact that numerous of these issues are possibly not measurable.

methodology (to formulate general rules and/or hypotheses i.e. create a body of knowledge by studying <u>physical</u> conditions which can be empirically verified), does not hold true under all circumstances.[53] Kurtz and Snowden (2003) give as an example the fact that the exploration of possibilities and generation of ideas are not in themselves tools recommending and leading to courses of action. Kurtz and Snowden (2003) are therefore of the opinion that not all endeavours (strategies) lead to some form of order – they can also easily lead to disorder and even chaos. According to these authors, disorder and chaos are just as important for organizational survival as order, but they are not as distinctive and measurable. However, it can be argued that disorder and even chaos, like order, must in the end lead to some form of output (perceived or real) in order to be of any value. Relating this argument back to the argument proposed by Chandler (1962), in order to be of value, all forms of organizational output must lead to some form of innovation. However, Mintzberg and Lampel (1999:28), building on the work of Chandler (1962), question whether all output is innovation, and argue that although strategy and innovation are intertwined, they form a managerial cycle of spurts of innovation followed by imitation and consolidation. This adds yet another dimension to the line of reasoning. In essence Mintzberg and Lampel (1999) propose that in order for managerial endeavours to be of value, they do not necessarily have to lead to some form of innovation. They can also lead to imitation. For instance, identical vehicles exiting a production line do not necessarily represent any form of growth in innovation, neither does the year-in-and-year-out duplication of the sale of exactly the same commodity to a market, constitute what is normally considered as being innovative. However, even if output represents no form of innovation, such output can lead to profitability. Arguably, in an extremely competitive environment, producing output without being innovative is normally only sustainable for a very short period of time, emphasising the statement made by Pearce and Robinson (2000) that continued organizational survival is dependent on <u>both</u> growth and profitability, or rather spurts of growth and profitability. This once again underlines the fact that in order to be of value to the organization, all endeavours

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[53]Refer to the Cynefin framework for collective sense-making as a consequence of discourse (Kurtz and Snowden, 2003).

must in the long run lead to both growth and profitability (tangible, or intangible) - growth and profitability not necessarily relating to any form of innovation.

In bringing all these above-mentioned points of view in relation with one another, the following deductions can be made:

- Strategy in itself means nothing; to be of value strategies must lead to some form of output.

- To add value, output can either be innovative, or if not innovative, imitative in nature.

- Output can be ordered, disordered, or even be of a chaotic nature.

- In order to be able to deliver output, within the strategic management process, there needs to be consolidation with regard to assessing the best route to follow and the best strategy to employ.

- In the strategic management process, knowledge is the catalyst and knowledge management the enabler. Knowledge management is capable of dramatically (via knowledge exploration and exploitation) speeding up this evolutionary process of strategy formulation (see section 2.4).

The relationship between strategy formulation, knowledge management (knowledge exploitation and knowledge exploration) is therefore a tightly woven net of decision making (refer to Figure 5.2). Strategy is therefore, as Mintzberg and Lampel (1999:28) rightly state: 'spurts of innovation (knowledge exploitation) followed by cycles of imitation and consolidation (knowledge exploration)'.

Figure 5.2: The relationship between strategy formulation, knowledge management and knowledge exploitation
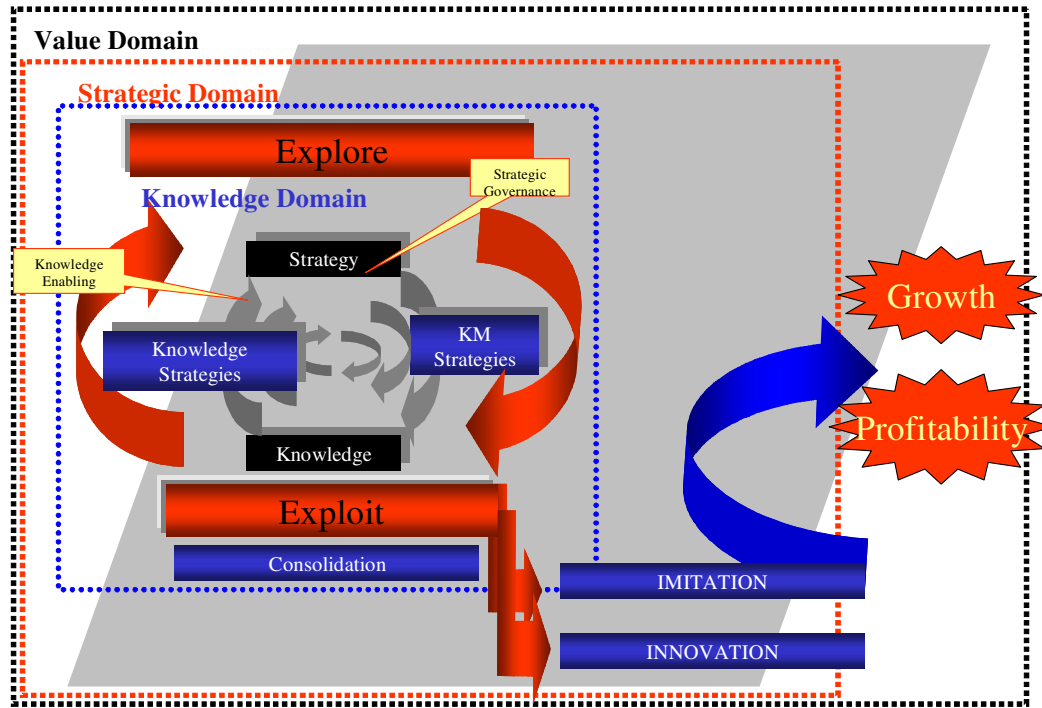
5.4 How to assess the efficiency and effectiveness of knowledge management from an organizational perspective

In the attempt to determine how to measure the efficiency and effectiveness of knowledge management in an organizational setting, the prevailing notion about relating endeavours in knowledge management to a specific form of output (i.e. innovation) is therefore questioned. Owing to the complex nature of managing knowledge (especially as a strategic enabler), it cannot be argued that the sum of the input will equal the output gained. This is primarily due to the filtering effect strategy has on knowledge management, i.e. not all endeavours lead directly to some form of output, and it is quite definite that not all endeavours in knowledge management lead to some form of innovation (incremental, technological, or radical). The idea of trying to prove that endeavours in knowledge management lead directly to a specific form of output (i.e. innovation) is therefore rejected. However, in assessing the value that knowledge

management adds to an organization, it is definitely true that in order to be of value, all endeavours must ultimately lead to growth and profitability, encapsulated as some form of output (imitation or innovation), even of an ordered, disordered or chaotic nature. In following this line of reasoning it is argued that profitability over time is a derivative of the quality of the organization's knowledge management endeavours (knowledge exploration feeding exploitation), whereas growth represents gain in quantitative measures. As argued by Pearce and Robinson (2000), profitability can easily be assessed, primarily via profitability ratios. However, determining organizational growth (since part of it is of an intangible nature) might not be so easy. Therefore, noting that it will probably be a futile exercise to try to formulate criteria to assess the value that knowledge management adds to intrinsic growth, for instance, and also taking care not to step into the same trap as authors such as Darroch and McNaughton (2002) (i.e. proposing a direct correlation between cause and effect), it is proposed that in assessing the value that knowledge management adds to an organization, a more holistic approach needs to be followed. Growth and profitability must be brought into relation with one another. Possibly the only way growth and profitability can be brought into relation with one another is through the intrinsic value both add to stakeholder value (refer to Chapter 2, section 2.4), i.e. organizational sustainability. It is therefore proposed that the value of growth and profitability be assessed as a derivative of output leading to the satisfaction of the different needs of the organization's stakeholders. In this regard profitability continues to be a measure of the ability to satisfy needs in a financially viable manner, i.e. profitability addresses qualitative measures, and growth (as a measure of stakeholder satisfaction) addresses quantitative measures[54].

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[54] In this context growth, both explicit and implicit, will be addressed. As an example, growth in market share relates to satisfying the need of shareholders, growth in the number of markets served, addresses the need of both shareholders and customers, growth in the variety of products offered, addresses the needs of customers, and growth in the technologies that are used to provide goods and services frequently leading to improvement in a firm's competitive ability, relates to growth in competencies, the ability to strategise, i.e. satisfying managerial needs.

5.5   The value of knowledge management in relation to knowledge maturity

In Chapter 4 (section 4.4) an evolutionary methodology with regard to the progression of knowledge management in an organizational setting was proposed. It was argued that certain issues, policies and strategies are crucial to effective and efficient knowledge management. The gist of the chapter was the proposition that when knowledge management issues are institutionalised in chronological order, the more strategically evolved organizations become, the more they are able to turn tacit knowledge into explicit knowledge, progressively enabling them to exponentially exploit the power vested in knowledge. As stated earlier, the quest to continually explore and exploit knowledge relates directly to the organization's goal of sustaining survival via growth and profitability. Remaining true to the notion expressed by Gallager and Hazlett (2004:02) to the effect that: 'there is a symbiotic relationship between the notions of measurement and evaluation and the two cannot be examined effectively in isolation', it is argued that progression in knowledge management maturity (from a strategic perspective) should relate directly to an increased ability to speed up the strategic cycle of imitation, consolidation and innovation. It would seem that the ability to explore and exploit the power vested in knowledge more rapidly, will be directly related to a decrease in imitation and an increase in innovation, with successive stages gradually speeding up the evolutionary process of transforming what is incremental into what is technological and then into groundbreaking innovation (refer to Figure 5.3).

Figure 5.3: Progression in knowledge management leading to increased innovation, growth and profitability.
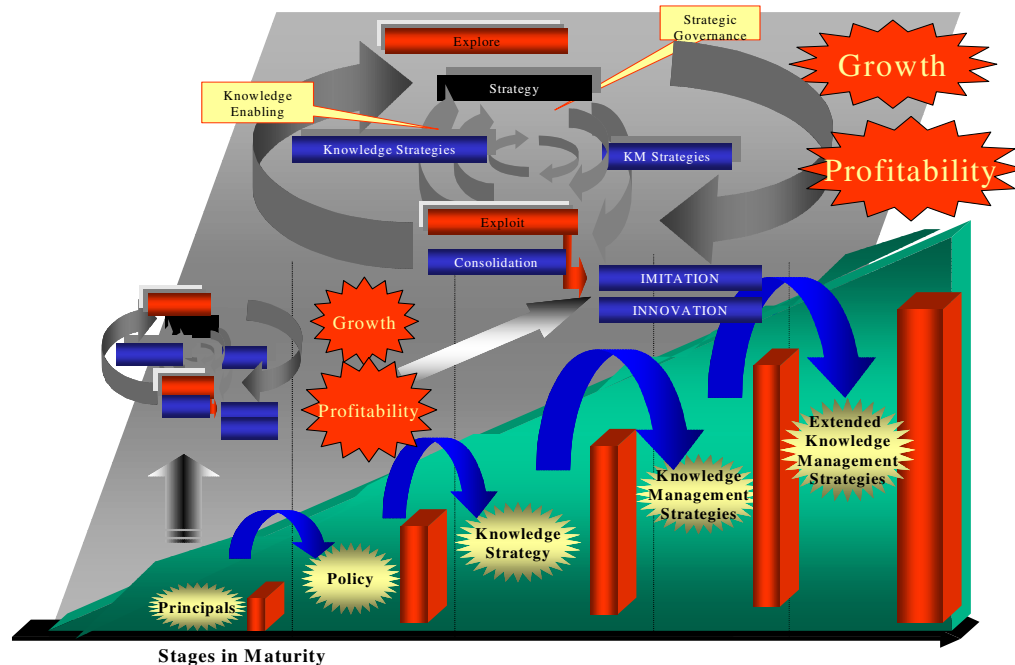
5.6   Summary

Throughout this chapter it has been emphasized that in order to ensure strategic output, different knowledge management processes need to be institutionalized, some cyclical in nature addressing a strategic perspective, and some relating more to an innovative perspective. In the quest to determine how to measure the efficiency and effectiveness of knowledge management in an organizational setting, it was argued that the prevailing notion of relating endeavours in knowledge management to a specific form of output (i.e. innovation) produces distorted results. It was proposed that the key to determining the effectiveness and efficiency of knowledge management therefore does not lie in trying to assess to what extent knowledge management leads to different forms of output, but specifically in determining to what extent strategies built on knowledgeable reasoning lead to organizational growth, profitability and sustainability.

It was argued that the quest to continually explore and exploit knowledge, relates directly to the organization's goals of survival, via growth and profitability. The proposition was made that if knowledge management enables business strategies to be formulated according to sound knowledgeable reasoning, then surely a measure of the success of all strategies is also a measure of the efficiency and effectiveness of knowledge management. It was emphasized that assessment of the efficiency and effectiveness of an organization is unfortunately no easy task, primarily due to the difficulty encountered when determining implicit growth. It was therefore proposed that measures to determine the efficiency and effectiveness of an organization should neither be derivatives of only the amount of growth produced, nor derivatives of only profitability, but a combination of the two. It was argued that even though it might prove impossible to determine all forms of growth, whatever form of growth is experienced would ultimately need to lead to the satisfaction of the different needs of the different stakeholders of the organization. In relating this argument back to knowledge management, it was argued that whatever endeavours in knowledge management are followed, the value of its contribution will, over time, be qualified in the satisfaction of stakeholders needs, and quantified in profitability and also some forms of growth.

CHAPTER 6: METHODOLOGY PROPOSED TO ASSESS THE KNOWLEDGE MANAGEMENT MATURITY OF AN ORGANISATION

6.1 Introduction

As a point of departure, to come to an understanding of the crucial role knowledge and knowledge management play in an organization, a critical review of literature was conducted in chapters 2 and 3. After reporting on the role knowledge plays as a strategic corporate resource and after determining the interdependent role between strategy, knowledge and knowledge management, chapter 3 sets out to answer whether there are any issues/models/methodologies or perspectives available in literature to guide strategists in the quest to effectively manage knowledge. In chapter 4 it is argued that these issues/models/methodologies and perspectives follow a chronological sequence of events, events that need to take place in order to institutionalise knowledge management successfully. In comparing the different knowledge management success factors to one another and in placing them in a chronological sequence, chapter 4 concluded with a knowledge management maturity model. Throughout all of these chapters the selection of sources were driven by the quest to assess knowledge and knowledge management's role in the process of speeding up the business evolutionary process. Appropriate measurement criteria for determining the effectiveness and efficiency of knowledge management was therefore also thoroughly analysed in chapter 5. Unfortunately, all propositions proposed in these chapters centre on purely academic reasoning. Therefore, careful not to fall into the trap of the research being banished to be vested on purely theoretical and/or academic realms, the decision was taken to turn all prepositions made out of the scholarly review into exploratory questions – questions that allow the practical adaptation of all ideas that were put forward.

6.1.1   Aim

Building on the inductive reasoning followed in chapters 2 to 5, the aim of chapter 6 is to bridge the gap between theory and practice and to supply scholars, practitioners and strategists with an instrument that not only successfully institutionalizes knowledge

management, but also to enable the successful measurement of knowledge management maturity, all from within a strategic/managerial rather than from a purely technological perspective.

6.1.2 Scope

In attempting to achieve this aim, the following aspects are given prominence:

•   Methodology to measure the knowledge management maturity of an organization.

•   Formulation of a knowledge management maturity questionnaire

6.2   Methodology to measure the knowledge management maturity of an organization

Figure 6.1: Methodology to assess the knowledge management maturity of an organization
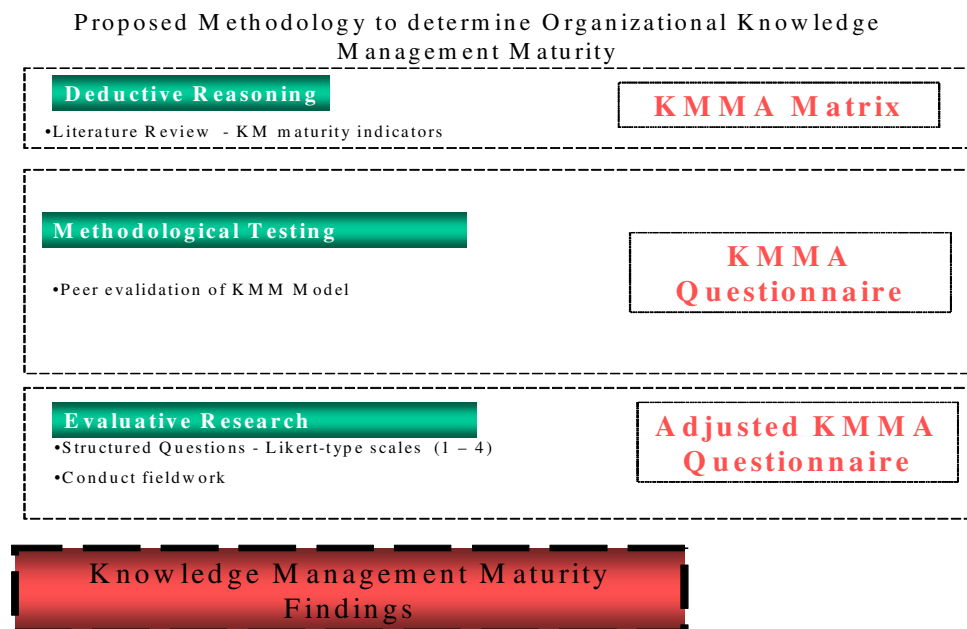
With reference to Figure 6.1, in Chapter 4 (section 4.4) an evolutionary methodology regarding the progression of knowledge management in an organizational setting was

proposed. Through a process of inductive reasoning[55], it was argued that certain issues, policies and strategies are crucial to effective and efficient knowledge management. The main thrust of the chapter was the proposition that when knowledge management issues are institutionalised in chronological order, the institutionalizing entity (in this instance the organization) becomes more strategically evolved. In essence, it was proposed that the process of institutionalization of knowledge management from within a managerial/strategic, rather than from within a technological perspective, aids in the transference of tacit knowledge into explicit knowledge, progressively enabling the exponential exploitation of the power of knowledge. Remaining true to the notion expressed by Gallager and Hazlett (2004:02) that: 'there is a symbiotic relationship between the notions of measurement and evaluation and the two cannot be examined effectively in isolation', it was argued that the level of knowledge management maturity relates directly to increased stakeholder satisfaction with regard to increased growth, profitability and sustainability. This section revisits the knowledge management maturity model formulated in Chapter 4 (section 4.4) and introduces the reader to the line of reasoning followed with regard to assessing the knowledge management maturity of an organization, especially from a managerial/strategic point of view.

In Chapter 4 (section 4.4) it was proposed that before any endeavour in knowledge management commences, as a preliminary phase (phase 1), a certain amount of ICT and information management (as enablers of effective knowledge management) must be present in the organization. In assessing whether or not this preliminary level of proficiency has been reached, and to what extent, the following questions need to be answered (vide Boon, 1990, Gurteen, 1998, Gallager and Hazlett, 2004):

- Are ICT relationships of a sound nature?
- Can the organization arrange, make accessible, protect, store, retrieve, analyse, filter, evaluate, package and dispose of information?

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[55] According to Mouton (2001:179): 'A review of literature is essentially an exercise in inductive reasoning, where you work from a "sample" of texts that you read in order to come to a proper understanding of a specific domain of scholarship'.

- Is there an inventory of information entities in the organisation?

- Can the organization organize, plan/design and evaluate an ICT system?

- Is the organization capable of shifting data and information by means of ICT, i.e. is there an ICT infrastructure in place that can support Information management?

- Is the organization capable of determining information needs?

- Are there measures in place to procure information?

- Can the organization determine the value and cost of information?

- Does the organization have an information policy and strategy in place?

Positive answers indicate the capacity to institutionalize formal knowledge management endeavours successfully.

The next phase (phase 2), requires a realisation of the importance of knowledge management as a formal function within the organization, and also associated drives to instill this realisation throughout the organization (refer to Chapter 4, section 4.4). Assessment to determine whether or not this level of maturity has been reached includes the following questions:

- Is the organization aware of the power vested in knowledge, i.e. is knowledge seen as a strategic resource?

- Is there a commitment from top management to the inculcation of a knowledge culture within the organization?

- Is there a commitment from top management to establish a formal knowledge management function?

- Is the organization capable of identifying issues, success factors and elements conducive to the establishment of a culture of knowledge and knowledge management architecture within the organization?

- In order to focus all future knowledge management efforts, are there distinct expressions of the future state of knowledge (the formulation of a knowledge vision) within the organization?

The following phase (phase 3), involves a conscious commitment, especially from business managers, to start embracing endeavours in knowledge management. At this level of maturity, ICT and Information Management (IM) must already be geared towards supporting knowledge management endeavours. Typical questions to determine whether or not this level of maturity has been reached include the following:

- Are ICT and IM capable of going beyond a point of merely supporting the flow of information, to a point of being capable of supporting management decisions and knowledge work?
- Is there an organization-wide knowledge policy in place?
- Is knowledge shared throughout the organization, and are there forums in place to provide governance for knowledge management activities, i.e. is there a working knowledge management function, and/or are knowledge domains established within the organization?
- Do functional owners send employees on formal training programmes, brainstorming sessions, and self-enrichment and learning exercises?

Phase 4 centres around the ability to consciously formulate a strategy (knowledge strategy) about knowledge as a strategic resource. Typically, at this stage of maturity ICT should by now also be geared to support the assimilation and distribution of knowledge in all spheres of the organization. Questions to determine this level of maturity should focus on the following:

- Is the organization capable of conducting a successful knowledge audit?
- Does the organization know what constitutes knowledge resources (both tacit and explicit), where knowledge resources are situated and why resources are strategic?

- Are efficient and effective ICT architectures and knowledge management infrastructures in place (single access points, centralized knowledge management databases, competitive intelligence systems, single enterprise resource planning systems, integrated decision support systems, group and team supporting systems, and possibly even executive support systems)?

Phase 5 deals with the ability to be able to both exploit and explore the power vested in knowledge and knowledge management (formulate knowledge management strategies). The essence of this level of maturity is therefore not only the ability to intentionally enhance strategy formulation, but also to streamline knowledge management processes and procedures. A checklist to determine whether or not this level of maturity has been reached, should focus on the following questions:

- Is the management of knowledge (all knowledge management tools) supplying a direct input to the strategic management process? (Is the Chief Knowledge Officer (CKO), and the knowledge management function an active participant in the strategy formulation process of the organization?)

- Is the organization capable of formulating strategies and plans to further enhance the capabilities of knowledge management, i.e. business strategies that will increase knowledge in a particular area and/or leverage existing knowledge? (According to Snyman and Kruger (2004) these plans must lead to defined Knowledge Management Projects with precise expected results, due dates, priorities and responsibilities – plans to further explore, create, acquire, transfer, capture, codify, share and distribute knowledge in an effective and efficient manner.)

- Do knowledge management strategies lead to efficient and effective plans, capable of transforming the organization's knowledge structure and supporting ICT structure from the 'as is' to the required 'should be' structure?

- Is there a culture conducive to knowledge sharing within the organization?

- Are individuals being evaluated or appraised on the basis of their knowledge capabilities and output?

With reference to Chapter 4 (section 4.4), as soon as organizations are capable of enhancing strategy via knowledge management, the next evolutionary step (phase 6), is the incorporation and utilization of knowledge vested in the organization's value chain and value chain partners. The primary requirement of this level of maturity is the ability to transcend the borders of the organization, e.g. the ability not only to share data and information, but also knowledge and expertise with all stakeholders in the organization's value chain. A checklist to determine whether or not this level of maturity has been reached should focus on the following questions:

- Are trans-organizational forums in place and is knowledge shared among value chain partners?
- Is the organization's ICT architecture capable of transcending the borders of the organization, e.g. capable not only of sharing data and information, but also knowledge and expertise with all stakeholders in the organization's extended value chain?
- Are holistic knowledge management strategies and plans formulated between members of the value chain, plans and projects to further explore and exploit the power vested in knowledge?

The final question (Phase 7) in determining knowledge management maturity has to do with determining to what extent knowledge sharing has been established as a culture within the organization. Finally, participants should also be allowed to propose a clairvoyant perspective of the future of knowledge management within their organizations. This will provide valuable insight into the future evolutionary path that knowledge management needs to follow within the organization.

6.3   Formulation of a knowledge management maturity assessment questionnaire

In following the above-mentioned methodology, a matrix consisting of 7 Phases was constructed (refer to Appendix A: Knowledge Management Maturity Assessment Matrix - KMMAM). Questions proposed in the KMMAM formed the essence of a questionnaire (refer to Appendix B: Knowledge Management Maturity Assessment Questionnaire - KMMAQ) to determine organizational knowledge management maturity. Since these questions, as a by-product, also test the participant's perceptions of a phenomenon (in this case the progression of knowledge management maturity in an organizational setting), this provided an opportunity to follow a research design inclusive of a study of interpretation of perceptions. This meant that any future instrument did not have to be based on a purely evaluative approach, since questions contained in the matrix also rendered possible the testing of aspects of a phenomenological nature.

To assist in achieving all this, proposed questions were benchmarked against a survey developed by the Public Management Service of the OECD (PUMA), originally adapted from work done by Statistics Canada for private firms. The original OECD appealed to the researcher because experts in the fields of knowledge management and public management have reviewed it internationally. Numerous questions contained within this survey are therefore based on questions in the original OECD survey. After revisions were made, before finalization, the questionnaire was once again thoroughly pre-tested and validated by a number of respected scholars in the field of knowledge management.

To ease the capture of data, the questionnaires were adapted for statistical use, both on paper and electronic media. Pre-testing resulted in a number of enhancements and provided the opportunity to verify the validity of questions. In constructing the questionnaire, it became clear that transition between phases is not cast in concrete; discrepancies and divergence between phases is a reality. It was stressed by scholars that phase 1 (ICT and Information management as enablers for knowledge management) should be split, especially due to a certain amount of ICT being a prerequisite for

information management to function optimally (refer arguments proposed in chapter 4, section 4.4.1). It was also forwarded that there might be some misunderstanding of the differences between concepts such as ICT and information management.

In order to shorten the questionnaire and also ease the capture of data, it was proposed that phases 2, 3 and 4 could be combined. After numerous discussions it became apparent that most knowledge management scholars do not agree with the distinction between knowledge strategy and knowledge management strategies. It was therefore decided to refrain from using the term 'knowledge strategy" in the questionnaire. Questions surrounding awareness of the power vested in knowledge were rather incorporated. Also the importance of knowledge as a strategic resource was incorporated under the analysis of knowledge management strategies. However, care was taken not to lose the gist of arguments proposed in chapter 4 (section 4.4). Thus, although sections proposed in the questionnaire differ from the maturity phases proposed in chapter 4, the line of reasoning remains the same. In order to clarify this point, with reference to table 6.1, the following section supplies a brief comparison between the phases forwarded in chapter 4, and the maturity sections included in the KMMAQ.

KMM Model (Chapter 4)	Questionnaire
Phase 1: ICT and IM as enablers of KM	Sections 1.1 and 1.2: ICT management (v5 – v9) Sections 2.1 – 2.4: IM management (v10 – v28)
Phase 2: Deciding on KM principles	Section 3.2 (v32 – v38) and section 3.3 (Setting the stage v39 – v45)
Phase 3: Ability to formulate a organization-wide Knowledge Management Policy	Section 3.3, specifically question 3.3.4, (v42) and section 3.4, question 3.4.1 (v46)
Phase 4: Formulation of Knowledge strategy/strategies	Sections 3.1 (v29 - v31), section 3.4, questions 3.4.2 (v47) and 3.4.3 (v48) and section 3.5 (v49 – 52)
Phase 5: Implementation of Knowledge Management Strategies	Section 4 (v53 – v 84).
Phase 6: Ubiquitous knowledge	Section 5 (v85 – 103).

Table 6.1: Comparison between the phases forwarded in chapters 4, and the maturity sections included in the KMMAQ

Questionnaire section 1: ICT management (v5 – v9) and section 2: Information management (v10- v28) addresses Phase 1: ICT and Information management as enablers of knowledge management (chapter 4, section 4.4.1).

Questionnaire section 3: Formulation of knowledge management principles, policies and strategy, specifically section 3.2 (v32 –v38) and 3.3 (v39 – v45) address Phase 2: Deciding on Knowledge Management Issues (chapter 4, section 4.4.2).

Questionnaire sections 3: Formulation of knowledge management principles, policies and strategy, specifically section 3.3, question 3.3.4[56] (v42) and section 3.4, question 3.4.1 (v46) address Phase 3: The ability to formulate an organizational-wide Knowledge Management Policy (chapter 4, section 4.4.3).

Questionnaire sections 3: Formulation of knowledge management principles, policies and strategy, especially sections 3.1 (v29 - v31), 3.4.2 (v47), 3.4.3 (v48) and 3.5 (v49 – 52) address Phase 4: Formulation of knowledge management strategy/strategies (chapter 4, section 4.4.4).

Questionnaire section 4: Implementation of knowledge management, sections 4.1 - 4.7 (v53 – v84)[57] address Phase 5: Implementation of knowledge management strategies (chapter 4, section 4.4.5).

Questionnaire section 5: Ubiquitous knowledge, section 5.1 and 5.2, questions (v85 – v103) address Phase 6: Ubiquitous knowledge (chapter 4, section 4.4.6).

Section 6 of the questionnaire (v104), although not directly related to any knowledge management maturity phase identified in chapters 3, 4, or 6, reflects in a holistic manner

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[56] Although question 3.3.4 (question v42) can be regarded as a knowledge management issue it is also a pertinent question with regard to the vesting of a knowledge management policy.
[57] Questions v59 and v61 can be considered knowledge management strategies; however, they are strategies prone towards extending knowledge management beyond organizational boundaries. Findings of questions v59 and v61 are thus discussed under the implementation of knowledge management, as well as under ubiquitous knowledge.

on the growth of knowledge management maturity over the past 5 years. In essence section 6 (assessment of knowledge management growth) can be considered a dependant variable related to sections 1 to 5 as independent variables.

Emphasis was also placed on determining how unambiguous the questions are, their statistical viability, and whether it would be possible for a competent manager and/or a knowledge management practitioner to complete all questions in less than 30 minutes. In order to be able to rank participants' perceptions with regard to knowledge management maturity indicators, Likert-type scales (1 – 4) were used for the most part, to express the degree of agreement with the structured questions.

After numerous revisions and alterations, the final questionnaire consists of six (6) sections, constituting (104) descriptive questions. As mentioned in chapter 1, to expand the research beyond purely theoretical and/or academic value, it was decided to test the usability of the proposed knowledge management maturity questionnaire in industry. Due to restrictions such as sensitivity, confidentiality and availability of information, preliminary research indicated an unwillingness of organizations to participate in the intended research. This problem was overcome by incorporating the research component into the research curriculum of MBA, MIT and MCom students of the University of Pretoria, South Africa[58]. Due to most of these students being active practitioners (97%), thus "senior" with regard to academic achievement as well as work experience, made them extremely suitable candidates to participate in the research effort.

After numerous lectures and discussions dealing with data, information, knowledge, and knowledge management, students were requested (via the use of the proposed KMMAQ) to critically evaluate the Knowledge management maturity of an organization they are familiar with (preferably the organization they are working for). In addition students were also requested to reflect on the usability and applicability of the proposed questionnaire,

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[58] The University of Pretoria requires that all research studies that involve human or animal subjects must have prior approval by an Ethics Committee. This is also the case for studies that involve surveys or interviews. It was therefore mandatory to obtain permission before embarking on the study to use students to conduct fieldwork.

specifically with regard to applicability to the environment and industry they are working in. In total 178 practitioners from nine industry groupings participated in the research effort.

At the commencement of research, the researchers thoroughly explained the anonymity of the process, purpose of the study and the importance of providing a true and honest reflection of all findings. Due to a number of restrictions and concerns raised, only volunteering students (and organizations) were allowed to participate in the study. Students were at all times allowed to voice difficulties with regard to the structure of the questionnaire as well as any form of uncertainty encountered in the proposed questions. In order to limit biased opinions, students were instructed to conduct structured interviews among strategic, middle/management as well as operational personnel in their respective organizations. Limited time, logistical limitations and a focus on providing insights rather than generating quantitative results made it impractical and unnecessary to include all personnel. Interviews (434 in total) were therefore purposefully conducted with individuals from different hierarchical levels[59]. The sample chosen was therefore not only representative of the managerial levels present in the organization, but also of all forms of diversity, in order to give a good indication and hence reliable results. After all questionnaires had been returned, students were supplied with a rating system enabling them to critically evaluate and elaborate on all findings and data gathered (refer to appendix C: Knowledge Management Maturity Assessment Rating System - KMMARS). Finally, to conclude the learning experience, an open session was held to elaborate on lessons learned and insight gained.

6.4   Methodology to empirically test the knowledge management maturity of organizations

As proposed in chapter 1, although not directly supportive of the aim, to supply knowledge management practitioners with a baseline of data against which to benchmark

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[59] Operational interviews conducted totalled 143, middle management totalled 158 and senior management interviewed totalled 133.

their organizations' knowledge management maturity, it was decided that the knowledge gained from this research conducted in the 86 South African-based organizations, should also be reported upon.

Therefore, in order to be able to extract comparable and meaningful findings from within the data contained within the knowledge management maturity questionnaires, Likert-type scales were being used to express the degree of agreement with the structured questions posed. This necessitates the use of a rating system. With reference to Appendix C (Knowledge Management Maturity Assessment: Rating System), the proposed knowledge management maturity rating system was constructed to enable the calculation of an overall knowledge management maturity score, and also to enable the calculation of scores, as achieved per different maturity section. Expressed as either values or percentages, knowledge management maturity per section was calculated as follows:

- Section 1: ICT Management - questions: V5 to V9 (maximum score achievable = 20)

- Section 2: Information Management - questions: V10 to V28 (maximum score achievable = 76)

- Section 3: Knowledge management issues (principles), policy and strategy - questions: V29 to V52 (maximum score achievable = 88)

- Section 4: Implementation of knowledge management (KMM level 5) - questions: V53 to V84 (maximum score achievable = 94)

- Section 5: Ubiquities knowledge – questions (KMM level 6) - questions V85 to V 103 (maximum score achievable = 76)

- Section 6: Assessment of knowledge management growth (questions: v104: maximum score achievable = 4).

The sum of all scores (overall knowledge management maturity reached) is calculated by adding the scores achieved over all maturity sections together. The maximum score any organization can achieve is the sum of 20 + 76 +88 + 94 + 76 + 4, totalling 358[60].

6.5   Summary

Drawing on the expertise of numerous knowledge management experts, this chapter built upon the inductive reasoning followed in Chapter 4 in particular, and proposed a questionnaire consisting of six (6) sections, constituting one-hundred and one (101) descriptive questions, enabling organizations to test and assess their Knowledge Management Maturity empirically.

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[60] Cognisance must be taken that the different maturity sections contribute different weights to the overall score achieved. The contribution of sections 2, 3, 4 and 5 is fairly similar, whereas the contribution of 1 and 6 is significantly lower.