

Assessment of Knowledge Management's Growth in South Africa

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ABSTRACT

This article revisits a debate surrounding Knowledge Management (KM) to report on an empirical study conducted in 86 South African based organizations, specifically regarding growth in KM maturity over a five year period. The findings indicate that KM is fairly well institutionalized in South African industry, with most organizations indicating that significant growth occurred in KM over the past five years. Analysis of the growth in KM maturity, as it relates to different organizational sizes, reveals that there are statistical differences between the score reported by Small, Medium, Large and Extra-Large organizations. Similarly, scores reported by Senior, Middle and Operational personnel differ primarily between the scores decided upon by Operational personnel and Senior managers. Viewed holistically, findings suggest that there could be a “break-even point” between resources available and KM growth with Extra-Large organizations given their advantage in KM growth. Findings also indicated that growth in KM differs between industry groupings, with Construction, Building Materials and Mining companies achieving high growth (+/- 70%), Consumer Goods and Utilities (+/- 60%), Banks and Insurance, Automotive and Transport, Government and ICT companies, moderate growth (+/- 50%), and Educational institutions, low growth (+/- 40%).

Keywords

Knowledge Management, Knowledge Management Growth, Knowledge Management Maturity.

1. INTRODUCTION

What specifically constitutes efficient and effective Knowledge Management (KM) remains a highly debatable topic. Authors such as Earl (1994), Chait (1999), Gallager & Hazlett (2004) and Kruger & Snyman (2005) emphasize that apart from technological support, KM also requires social interaction. Due to the cycle of transferring data into information and information into knowledge, Information and Communication Technology (ICT) systems tend to render information making KM possible. Kruger & Snyman (2005) therefore identify an increased interdependency between ICT Management, Information Management and Knowledge Management. Analogous to this argument, Kazimi, Dasgupta & Natarajan (2004; 01) argued that, “...today there is a growing realization that organizations can attain maturity in KM only through a healthy coexistence of technology, processes and people, thereby paving the way for knowledge management successes in the years to come.” Arguably, for knowledge to be sufficiently managed, organizations must progress to a point where they are able to manage ICT, information and knowledge simultaneously.

Maturity models seldom if ever address the managerial interdependency between ICT, information management and KM (Gallagher & Hazlett, 2004; Kruger & Snyman, 2005). This according to Kazimi, Dasgupta & Natarajan (2004) and Gallagher & Hazlett (2004) is primarily due to the fact that most maturity models are being derived from the Software Engineering Institute's Capability Maturity Model (CMM). These authors and Botha & Fouche (2002), reason that maturity models place too much emphasis on technological concerns, neglecting to address "softer" managerial and strategic concerns.

In questioning whether maturity should be based on CMM, Kazimi, Dasgupta & Natarajan (2004) argue that because we are working with abstract components (knowledge, culture, processes or communities) there is a great deal of disillusionment about ICT, information management and KM that first needs to be addressed. Gallagher & Hazlett therefore criticize current KM maturity models arguing that they either 'expend too much effort in trying to address technological concerns', or are 'too vague and offer little in the way of practical assistance' or not enough 'emphasis is placed upon culture and other management issues'. According to Kruger & Snyman (2005), this means that for knowledge to be adequately managed organizations must progress to the point where they are able to manage knowledge as a strategic resource and ICT and information management as enablers to KM. Defining the border between ICT, information management and KM, will in all certainty remain a highly debatable topic. It is the authors' belief that this debate is drawing attention away from the most determining factor in KM's survival which is the acceptance of KM and use by industry. To date, few studies are focusing on the amount of growth that is occurring in KM, or if employees and managers hold similar opinions regarding the amount of growth that is occurring in KM.

A questionnaire appealed to the researchers primarily because all of questions would be 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 OECD questionnaire was reviewed internationally by numerous experts in the fields of KM and public management. Kruger and Snyman (2007) revised the OECD questions to suit the South African environment. The questionnaire was reviewed by a number of respected scholars in the field of KM and was thoroughly pre-tested.

Kruger & Snyman (2007) questionnaire consisted of six sections and 104 questions to test and assess the Knowledge Management Maturity of organizations from within a strategic/managerial framework, rather than from a technological perspective. In order to extract comparable and meaningful findings from within the KM maturity questionnaire, Kruger and Snyman (2007) utilized a four-point Likert scale to express the degree of agreement with the posed questions. This maturity rating system was designed to calculate an overall KM maturity score based on multiple sections and expressed as values or percentages. The KM maturity sections were calculated as follows:

- Cover Page: Demographics, q.1 - 4 (Max score = 0)
- Section 1: ICT Management, q.5 - 9 (Max score = 20)
- Section 2: Information Management, q.10 - 28 (Max score = 76)
- Section 3: KM Issues (Principles, Policy, Strategy), q.29 - 52 (Max score = 88)
- Section 4: Implementation of KM, q.53 - 84 (Max score = 94)
- Section 5: Ubiquities Knowledge, q.85 - 103 (Max score = 76)
- Section 6: Assessment of KM Growth, q.104: (Max score = 4).

The overall KM maturity was calculated by adding the scores achieved in the individual sections together (20 + 76 + 88 + 94 + 76 + 4) for a total of 358 points. Section 6 of the questionnaire was a dependant variable according to Kruger and Snyman (2007) testing the amount of growth in KM maturity over the past five years (Appendix). Note: Although the questionnaire by Kruger and Snyman (2007) address the total spectrum of KM maturity, this article only focuses on the amount of growth in KM maturity that occurred over a five year period.

All arguments proposed by Kazimi, Dasgupta & Natarajan (2004), Gallagher & Hazlett (2004) and Kruger and Snyman (2007) are founded on purely theoretical reasoning. Beyond critique of current maturity models, the research literature has neglected to supply empirical evidence of the maturity and especially growth in maturity of KM, from within a strategic/managerial rather than from a technocratic perspective. To move past these theoretical propositions, this paper revisits the KM maturity questionnaire proposed by Kruger and Snyman (2007) and reports on a study conducted in 86 South African based organizations, within nine industry groupings, all to determine the KM maturity growth of organizations, from within a managerial, rather than from a technological perspective.

2. METHODOLOGY AND DATA COLLECTION

Different paradigms in philosophy of science (i.e., positivism, realism, postmodernism, critical theory, phenomenology) all impact the way we think about the concept of knowledge. Arguments surrounding knowledge and KM therefore often border on the philosophical. All methodologies and models proposed in this paper ultimately have to answer and adhere to a number of scientific and meta-scientific perspectives.

The line of reasoning followed in this paper is therefore based upon the theory that knowledge is the most strategically significant resource of the firm, and that KM is supported by ICT and information management.

Due to restrictions such as sensitivity, confidentiality and availability of information, preliminary research attempts showed an unwillingness of organizations to participate in the intended research. This problem was overcome by incorporating a research component into the curriculum of MBA, MIT and MCom students of a large urban university in South Africa. Since most of these students were active practitioners (97%), and considered “senior” with regard to academic achievement as well as work experience, they became suitable surrogates to participate in the research project. (This research study involving human subjects was approved by an Ethics Committee of the same university).

After numerous lectures and discussions dealing with data, information, knowledge, and KM, senior practitioners used the Knowledge Management Maturity Assessment Questionnaire (KMMAQ) by Kruger & Snyman (2007) to critically evaluate the Knowledge Management Maturity of their own organization or one with which they were deeply familiar. To minimize

bias due to self reporting, subjects were instructed on the need for objectivity through group and one-on-one discussions as well as debriefing individually when questions arose. Only volunteering practitioners (and organizations) were allowed to participate in the study. In total 178 senior practitioners from nine industry groupings participated in the research conducting three structured interviews per practitioner. In order to sample each of the managerial levels, practitioners were instructed to conduct structured interviews among strategic, middle/management as well as operational personnel in their respective organizations. South African industry is considered a benchmark for developing economies with an environment characterized by continued change, diversity and even elements of silent intolerance and conflict. In developing economies, the understanding that KM is an enabler for development is growing in acceptance.

The decision regarding the selection of organizational groupings were guided by organizational sectors as prescribed by the Johannesburg Stock Exchange (JSE) and guidelines provided by McGregor Business and Financial Analysis (BFA). BFA supplies real-time and historical fundamental information on South African listed companies, top unlisted companies, local and international economic data as well as international financial indicators and currency exchange data. As seen in Table 1, the selection of organizational groupings led to a fairly even distribution of the total population under research with government representing the highest population (18.43%), and automotive and transport (Auto/Tran) representing the smallest population (4.38%).

Type	Abbreviation	%
Automobiles/Transport	Automotive/Transport	4.38
Banks and Insurance	Financial/Banking	10.14
Chemicals, Pharmaceuticals	Pharmaceuticals	6.68
Construction, Building Materials and Mining	Resources	6.22
Consumer Goods and Utilities	Consumer Goods	13.36
Information Technology and Telecommunication	ICT	17.05
Education	Education	10.83
Consulting , Auditing, and Service Delivery	Service	12.90
Government	Government	18.43

Table 1: Organizational Grouping and Weighting

The study sample consisted of 434 employees from 86 South African based organizations within the nine industry groupings selected. Due to the diversity of organizations participating in the study, the sample population consisted of individuals from diverse backgrounds and cultures. The sample chosen was therefore not only representative of the managerial levels present in organizations (operational personnel totaled 143, middle management 158 and senior management 133), but also ethnic and gender diversity.

Data collected by means of the structured KMMAQ was digitalized through keyboard entry and transferred to a rating system. In order to ensure a clean and error-free data set, the process of data capture was closely monitored to ensure as few errors as possible. Newly imported data was checked for capturing errors via standard validation checks as applied by the University. Checks

included frequencies, maximum, minimum, range and checks for missing values. After the verification process had been completed, all data collected was carefully prepared for tabular and graphic presentation, analysis and interpretation. The computer software used for analysis and modeling was SAS version 8.3, from the SAS Institute™. All graphs and figures were created using Microsoft Excel (2003).

An objective stance was maintained in analyzing all research results. All statistical calculations were verified by the Bureau for Statistical and Survey Methodology (Statomet). Statomet is a facility that focuses on the scientific design and management of research. Statomet provides statistical advice on all aspects of research design and management, and aims to improve the quality of research by rendering a multidisciplinary service to public and private organizations.

The analysis that follows consists of the descriptive statistics used for each question. Descriptive statistics involved arranging, summarizing and presenting the data in such a way that the meaningful essentials of the data could be extracted and interpreted easily. Statistics used established the basic statistical measures of the response variable for every question covering aspects pertaining to ICT and information management. Unless specifically stated, in all instances findings are elaborated upon from a positive affirmation “yes, definitely” and “yes, but not significantly”. Where the probability of exceeding the norm (p-value) was found to be less than 0.05, the decision rule was to reject the null hypothesis at a 5% level of significance.

3. DISCUSSION, RESULTS & FINDINGS

The average KM maturity score obtained by all 86 organizations in the nine industry groupings, totaled 175 points. This constitutes an overall maturity of 49%. The score obtained for ICT and Information Management as enablers to KM, totaled 73.60% and 61.14% respectively. With a score of 51.75%, organizations are able to successfully identify KM Issues, Principles, Policies, and Strategies. However, totaling a score of only 46.50% the ability to successfully identify KM Issues, Principles, Policies, and strategies are not carried through to successful implementation of KM. Also, in achieving a score of only 30.27%, South African organizations struggle with extending KM beyond their borders (Ubiquities Knowledge) (Figure 1).

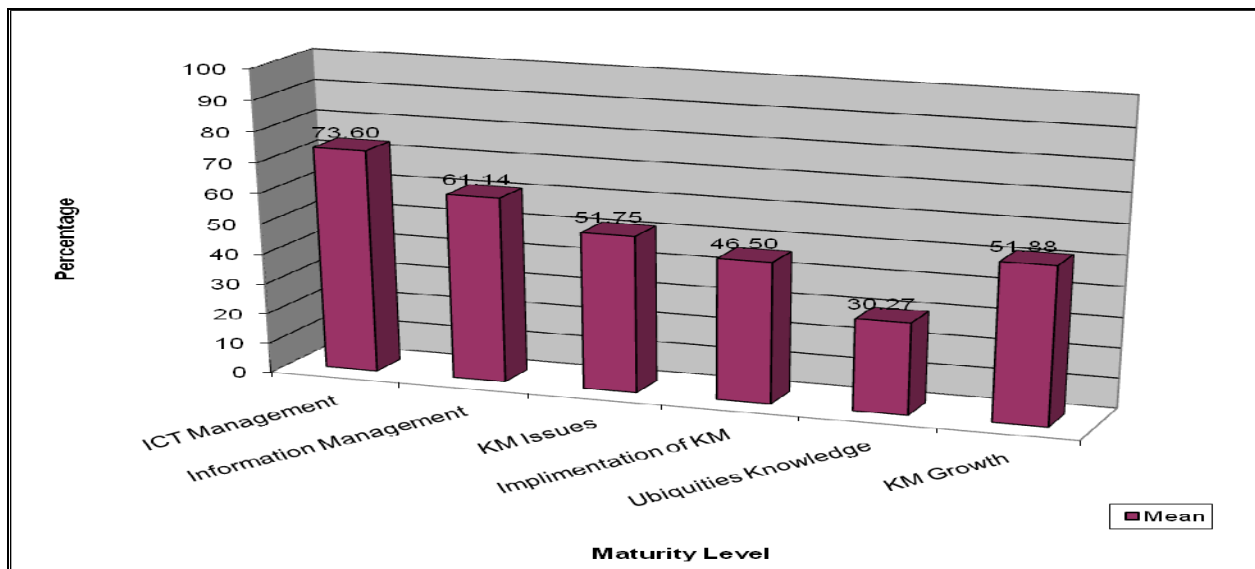


Figure 1: Knowledge Management Maturity per Maturity Sections

With regard to growth in KM maturity, the average score obtained by South African organizations interviewed was 51.88%. Slightly more than twenty percent (20.28%) of interviewees indicated that their organizations experienced rapid growth (3+ maturity levels), in KM maturity, 52.12% is of the opinion that although growth occurred, it was not significant (1-2 maturity levels), and while 22.17% argued that although no growth took place there will probably be growth within the next five years. Slightly more than five percent (5.43%) were of the opinion that a decline in KM growth occurred over the past five years (Figure 2).

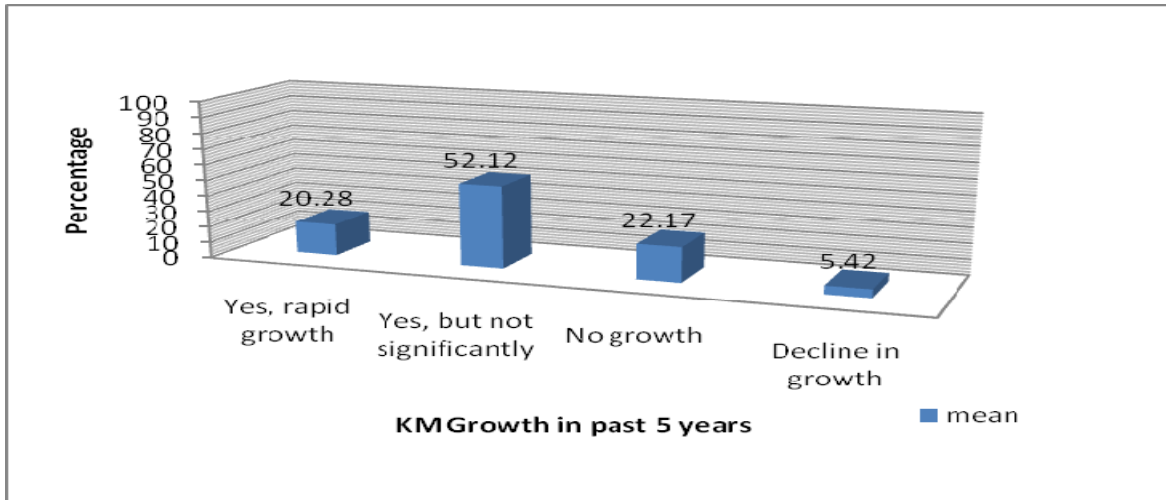


Figure 2: Growth in Knowledge Management Maturity

3.1 Knowledge Management Maturity by Organizational Size

In order to determine if organizational size plays a role in KM maturity growth, it was decided to group organizations into four (4) categories. Organizations with 100 and less employees were grouped into the “small organization” category. Organizations with between 101 and 2000 employees were grouped into “medium-sized” organizations, 2001 to 25,000 employees into “large organizations” and 25,001 and organizations of above grouped into “extra-large organizations (Table 2).

Category (Number of Employees)	Organizations pre Category	%
Small (1-100)	21	24.42
Medium (101 – 2,000)	24	27.90
Large (2,001 – 25,000)	21	24.42
Extra-Large (25,001 +)	20	23.26

Table 2: Number of Organizations / Organizational Category

Organizations with 100 and less employees (small organizations) achieved 43.68% growth in KM maturity over the past five years. Organizations with between 101 and 2000 employees (medium-sized organizations) achieved 55.24% growth. Large organizations (between 2001 & 25,000 employees) scored a bit lower than medium-sized organizations totaling 51.78%.

Organizations with more than 25,000 employees (extra-large organizations) consistently outperformed all other organizations, on average scoring 56.25%.

Findings indicated that extra-large organizations are at an advantage when it comes to the institutionalization of KM practice. As a rule extra-large organizations do have access to considerably more resources than smaller sized organizations, possibly explaining why extra-large organizations (25,000+ employees) obtained the highest growth in KM maturity. The lower score achieved by large organizations (51.78%) compared to the score achieved by medium-sized organizations (55.24%), suggests that there could be a “break even point” between resources available and the successful institutionalization of KM. This argument necessitated that for analysis purposes a more holistic stance needed to be taken. Note had to be taken of not only the achievement of organizations according to size, but also of the achievements in relation to the different managerial levels present within organizations. Specifically, analysis needed to include a study of the diffusion, (the spread in score between the different managerial levels), of KM growth in different organizational sizes and organizational settings.

3.2 Knowledge Management Maturity as a Function of Managerial Level

Senior managers scored growth in maturity at 54.88%, middle managers decided upon a figure of 53.22% and operational personnel forwarding a figure of 47.69%. This constitutes an overall difference in scores between senior management and operational personnel of 7.19%. Analysis of Variances (ANOVA) indicated that there is indeed a statistical difference between the score reported by the different managerial levels. In order to determine where specifically difference occurred¹, it was established that differences were vested primarily between the values decided upon by operational and senior managers. This indicates at an over-estimation, or difference in perception by managers, regarding; (1) the success of implementation of KM; (2) the efficiency and effectiveness of KM issues, policies and strategies; and (3) sufficient support given to the institutionalization of KM endeavors. Operational personnel are not sharing the same sentiment regarding the success of KM as senior management. There is a strong indication that middle management (supported by senior management) holds the key to successful growth of KM. In top achievers, middle manager’s scores were on average similar or slightly higher than senior managers.

3.3 Knowledge Management Maturity Growth by Managerial Level within Organizational Size

When differences in opinion with regard to KM maturity growth, as decided upon by the different managerial levels, are viewed from within the perspective of different organizational sizes, the picture changes dramatically (Table 3). As a point of departure, an Analysis of Variances (2 way ANOVA), was done to determine if there is indeed a difference between the score achieved per organization size and the scores decided upon per managerial level. Again it was confirmed that the mean values decided upon by the different managerial level and organizational size are statistically different.

In comparing the totals reported by operational, middle and senior personnel to one another, by means of a GLM Procedure (Least Square Means), it was confirmed that the scores decided upon by operational personnel and middle managers are similar in small organizations. However, scores decided upon by operational personnel and middle managers in medium, large and extra-

¹ The GLM procedure (Least Squares Means) was used to determine where specifically difference occurred.

large organizations are different. Also, within medium and extra-large organizations, the scores decided upon by senior managers were found to be smaller than the scores decided upon by middle management.

	% Small	% Medium	% Large	% Ex-Large	% Avg.
Operational	42.76	52.63	41.93	51.51	47.69
Middle	42.36	58.16	51.35	60.15	53.22
Senior	46.55	54.05	62.50	57.25	54.88

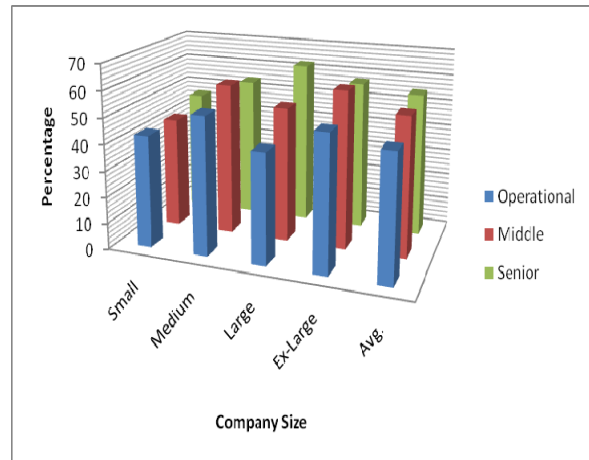


Table 3/Figure 3: KM Growth by Managerial Levels within Organizational Size

With reference to Figure 3 and Table 3, of interest is that the deference in score between senior and middle managers is most dominant (+/- 10%) within large organizations, and fairly similar (+/- 4%) between small, medium and ex-large organizations. In contrast, the difference in score between middle and operational personnel is narrow within small (+/- 1%) and medium sized organizations (+/- 5%), and broader in large and extra-large organizations (+/- 9%).

Primarily due to low scores of middle managers, KM growth in large organisations (e.g., NOT extra-large organizations) are lower than KM growth in medium sized organizations. Again this strongly hints at a “break even point” between resources available and the successful institutionalization of KM. There is a strong indication that middle management (supported by senior management) holds the key to successful growth in KM. In extra-large and medium sized organizations, middle manager’s scores were on average higher than senior managers (Table 3), and lower than senior managers in small and large organizations.

1.1 Knowledge Management Maturity Growth by Industry Grouping

Due to the structure of the questionnaire, captured data also enabled the analysis of KM maturity growth for different organizational types, as applicable to South African Industries. The industry sector that achieved the highest overall growth in KM maturity score was the Construction, Building Materials and Mining (Resources) grouping, with an average score of 69.44%. The second highest growth in KM maturity was recorded by the Consulting, Auditing and Service Delivery (Services) industry, recording 61.16% growth. Consumer Goods and Utilities (Utilities) came in third at 54.62%, followed closely by the Automotive and Transport industry at 52.63%. Government departments

faired surprisingly well, recording growth in KM maturity of 49.37%. The KM maturity growth of Banks and Insurance, and ICT companies are moderate, at 48.83%, and 48.55% respectively. At 47.41%, these score are similar to the scores decided upon by Chemical and Pharmaceutical companies. In contrast, the Educational industry achieved the lowest growth in KM maturity of all industries interviewed, totaling 42.02%. This finding is supported in that Educational institutions also received the lowest scores over nearly all maturity levels of all organizational groupings interviewed. Possibly, the low score attributed to maturity Section 2 (Information management) carried through to the subsequent maturity sections and growth in KM maturity. Another explanation could be the hoarding culture associated with academics resulted in the guarding of knowledge as a strategic differentiator

Industry Group	Growth %
Automotive/Transport	52.63
Financial/Banking	48.83
Pharmaceuticals	47.41
Resources	69.44
Consumer Goods	54.62
ICT	48.55
Education	42.02
Service	61.16
Government	49.37

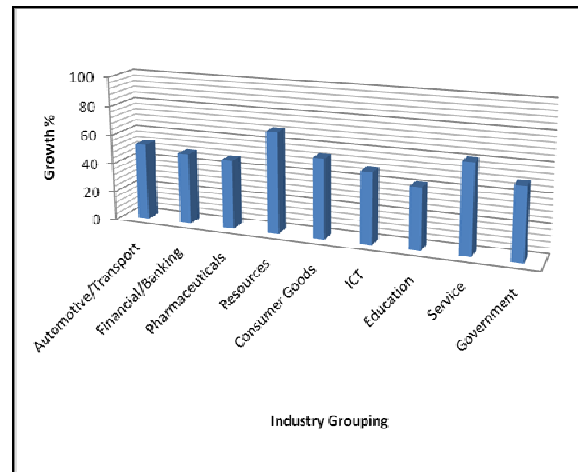


Table 4/Figure 4: Organizational Grouping and Maturity Growth

4. LIMITATIONS

It must be acknowledged that the management of knowledge, in all its complexity, constitutes much more than the issues identified in this research. As the body of knowledge evolves, the line of reasoning proposed and the associated questionnaire must be updated and revised on a regular basis. The use of the Likert scale, used in the KM maturity questionnaire may not have appropriately captured all data. Of interest for future research would be to repeat the experiment and change the description of the incision points used, and/or alter the number of incision points used. This study may therefore be viewed as a “pilot study” to provide insights. To take into account the time for ICT and information management to impact on KM, more research is needed before growth in KM maturity can be calculated more accurately. Such a longitudinal study should span a number of years and be inclusive of additional industries, within different managerial and strategic settings.

Given the time and logistical limitations of this study, plus a focus on providing insights rather than generating quantitative results, it was impractical and unnecessary to include all organizations within South African industry. However, due to the subjects of research being drawn in as integral parts of the research design, manipulation due to “overly

emotional or subjective involvement” could have occurred due to respondents serving their own, rather than the research needs. A quandary still to be investigated is that in medium and extra-large organizations scores decided upon by middle management is consistently higher than the scores decided upon by senior management.

5. CONCLUSION

The most determining factor in Knowledge Management (KM)’s survival is acceptance and use by industry. In contrast to this argument that KM might be a fallacy not able to withstand the test of time, only 27.60% of South African organizations indicating that no growth or a decline in KM growth occurred over the past five years. Due to the South African industry being considered a benchmark for Western industry with an environment characterized by continued change, diversity and even elements of silent intolerance and conflict, these findings are of extreme importance to KM practitioners, scholars and professionals. In moving past theoretical propositions and investigating growth in KM as it relates to different organizational settings, managerial levels and industries, it can be concluded that KM is taking on a new dimension, one where it is growing in stature, becoming a self-governing entity, dependent upon, but separate from ICT and information management.

Analysis of the growth in KM maturity as it relates to different organizational sizes reveals that there are statistical differences between the score reported by small, medium, large and extra-large organizations. Similarly, scores decided upon by senior, middle and operational personnel differ primarily between the scores decided upon by operational personnel and managers. Growth in KM changed vastly between different industry groupings, with Construction, building materials and mining companies achieving high growth, Consumer goods and utilities, Banks and insurance, Automotive and transport, Government and ICT companies, moderate growth, and educational institutions, low growth. When differences in opinion with regard to KM maturity growth, as decided upon by the different managerial levels, are viewed from within the perspective of different organizational sizes, it is revealed that the deference in score between senior and middle managers is most dominant within large organizations, and fairly similar (+/- 4%) between small, medium and ex-large organizations. Extra-large organizations seem to be at an advantage regarding KM growth.

Viewed holistically, findings suggest that there could be a “break even point” between resources available and KM growth. Though organizational size and the availability of resources influence the successful institutionalization of KM, in a practical sense growth in KM might be more dependent on a deliberate, conscious and calculated managerial effort, than on factors such as organizational size and the competing industries.

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7. APPENDIX

SECTION 6 Assessment of Knowledge Management Growth

Please use the code:

- 1** = Yes, rapid growth (3+ maturity levels) **Y**
- 2** = Yes, but not significantly (1-2 maturity levels) **S**
- 3** = No growth, probably within the next 5 years **P**
- 4** = No growth, or decline in growth **N**

6.1	Please reflect on the growth of knowledge management in your organization over the past 5 years	Y	S	P	N
		1	2	3	4