

Maturity mapping for continuous improvement: A case study of a revenue services institution

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Background: Continuous improvement is a topic that organisations sometimes avoid since it identifies areas lacking business excellence. Continuous improvement is possible in organisations that take a holistic approach to managing knowledge, which gives them the ability to continue to innovate and sustain their value creation to their stakeholders.

Aim: The levels of knowledge management maturity in the Tax Audit Business Unit of a revenue services institution had to be identified in order to provide guidance on how to improve and contribute to future information and communication technology (ICT) strategy planning.

Setting: The ICT strategy planning process at the revenue services institution identified a gap in how it managed information and knowledge. This indicated a discrepancy in knowledge management (KM) maturity.

Method: A deductive approach was followed, motivated by analysis of tested and well-researched theories to create a theoretical framework. This was then tested against empirical research conducted in a specific business unit. Descriptive statistics in the form of frequencies, proportions, and means were obtained from the data, to describe the patterns and trends in the data set.

Results: The key findings confirm that generally the value of KM is well regarded. Barriers exist and levels of consensus generally drop as the levels progress towards the highest KM maturity level, mostly lacking in terms of continuous improvement.

Conclusion: The conceptual KM framework developed from this study will give revenue services institutions insights on how to innovate and sustain their value creation to their stakeholders. The desired activities for adoption of the framework will help achieve continuous improvement of a revenue services institution.

Introduction

The strategies of revenue services institutions (RSIs) are integral to a country's overall development. Gcabo and Robinson (2007:358) argue that 'as the developing world becomes more deregulated and integrated', it is important that 'tax strategies and/or tax policies be appropriately designed and continuously monitored'. This article builds on the argument, accentuating the need for continuous improvement based on sound knowledge management (KM) practices. An organisation gains a competitive edge through what it knows, how it uses what it knows, how fast it can know something new, and how well it uses this knowledge to continuously improve itself for the purpose of its value proposition to clients (Carlucci 2016; Davenport & Prusak 1998). In order to achieve business excellence, organisations have to continue to innovate and improve their practices.

Continuous improvement requires formal structures, methods and processes to manage its most valued intangible asset, that is, knowledge. Knowledge management is necessary for sustainable value creation (Smith, McKeen & Jenkin 2009:8). While KM takes centre stage in highly innovative organisations, many organisations have not adopted a holistic KM approach throughout all their business units (Esterhuizen 2012; Langen 2000). Discrepancies within a single business unit may cause KM maturity delays (Ehms 2001; Langen 2000). Organisations such as RSIs have many business units, each striving towards optimal customer service delivery.

The motivation for this study was to gain a deeper understanding of KM maturity within a RSI in Africa in order to inform its future information and communications technology (ICT) strategy planning. Based on this motivation, the perceived KM maturity levels of the Tax Audit Business

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Unit, specifically of the assessment of income tax for both individual and company entities, were identified as the research gap. The ethical guidelines of the University of Johannesburg suggested that all case studies employ the practice of anonymising empirical findings; in this study the institution is referred to as 'the RSI'.

In order to address the research problem, this study aimed to develop a suitable framework that would assist with mapping of the perceived KM maturity levels of the RSI's individual and company taxpayer entities. In order to develop the framework, these four research objectives applied:

- Gain insight on the level of consensus about the value of knowledge in the organisation.
- Determine the perceived value of lessons learned and of sharing lessons in order to ensure continuous improvement.
- Identify the role of existing information infrastructure for retention and retrieval of knowledge.
- Test the level of consensus of the role of leadership in creating a knowledge sharing culture. This would give an indication of how the RSI's tacit knowledge is utilised or transformed to explicit knowledge in order to enable the continuous improvement of service delivery.

Since this was the first study of this nature at the RSI, an assessment of the maturity of KM could take many forms. This study focused its investigation on a single case, simplified by following a knowledge management maturity model (KMMM) adopted for this study. Generally, the levels of KMMMs give an indication of how well the KM function is organised. Only if KM is well organised, can it truly contribute to continuous improvement, and enhance organisational performance and achieve business excellence (Carlucci 2016; Rašula 2012).

This article begins by providing the theoretical evidence used to construct the conceptual KM framework. The research method, with an explanation of the case study research design, precedes the analysis and discussion of the research findings of KM maturity. The article concludes with recommendations on adopting the conceptual KM framework. The value of the study is towards strategic and tactical levels with the intention to address KM maturity shortcomings.

Knowledge management maturity mapping for continuous improvement

Defining the concept of knowledge management will create better understanding in the broader context of management and economics sciences. Probst (2005:22) defines knowledge as 'the entirety of proficiency and skills that individuals use for problem solving'. That means all theoretical skills, as well as rules on how to act. Knowledge uses data and information, but is always connected to individuals (Probst 2005). Knowledge is developed from

individuals and represents the expectations about cause-and-effect relations (Probst 2005).

In business management, Drucker (1988) accentuates the fact that without knowledge, organisations cannot add desired value in their endeavour to satisfy customers. Drucker (1988) argues:

Knowledge results when the intellect (capacity to think) does a purposeful work using data and information. It generates new products, powers new processes, and spawns new materials. It affects all levels and functions in organisations. Every individual is now a knowledge worker. (p. 47)

Given these definitions of knowledge, business management is defective without knowledge management.

KM applies in business as much as in government and non-profit organisations. Some of the known benefits of KM in local government found by Ezra and Smith (2009), Gaffoor and Cloete (2010) include:

- KM creates the opportunity for employees to develop their skills, performance, and experience through group work and knowledge sharing.
- KM improves organisational performance by means of better quality, innovation, productivity, and efficiency.
- KM facilitates better decision-making, more collaboration, restructuring of organisational processes, and a decline in the duplication of work, consequently cutting operational costs and improving service delivery.
- KM increases the financial worth of an organisation.
- Knowledge sharing creates value in an organisation and strategically enables a competitive advantage.
- KM supports intelligent choices, using limited resources, in order to execute the strategy of learning how to continue to improve.

Although these benefits give KM its leverage, KM activities have to be measured in order to make them more visible and positioned at strategic level (Langen 2000:12). The barriers of KM are noticeable especially in the public sector. Paulin and Suneson (2012:81) define knowledge barriers in the context of knowledge sharing and transfer, distinguishing the thin line between knowledge transfer and sharing. A knowledge barrier is a failure in knowledge transfer, and consequentially the barrier becomes interchangeably the failure to transfer knowledge (Paulin & Suneson 2012:88).

Barriers of KM are broadly categorised as personal and organisational barriers (Bernuy 2012; Probst 2005). Examples of these barriers are lack of awareness, poor leadership, lack of top management support, lack of motivation, lack of time and effort, no incentives, poor planning, and poor perception of value (BenMoussa 2009:902–903). Implementing KM in the public sector is generally more difficult than in the private sector, owing to existing barriers and the complexity of stakeholder requirements (McAdam & Reid 2000; United Nations ECLAC 2013). The public sector goals aim at improving quality of life of citizens, economic growth, and

environmental development, more than on profits. This dilemma requires KM experts to help public sector managers and leaders to have a paradigm shift in addressing knowledge gaps and leveraging KM for better outcomes in an integrated manner across all spheres of public sector entities. A specific focus is required in removing barriers to ensure better knowledge flows across, for instance, the value chain of a RSI. The theory of mapping KM to measure maturity of knowledge practices in an organisation applies.

Knowledge management maturity models

In KM, maturity levels define an organisation's capability to manage knowledge assets to ensure the continuous improvement of business through its lessons learned (Ihrig & Macmillan 2015; Kulkarni 2007; Weerdmeester, Pocaterra & Hefke 2003). It also broadly measures an organisation's capability to initiate action once tacit knowledge is transformed into explicit knowledge. This may be in the form of innovation or decisions taken that improve business performance or enhance customer or stakeholder value (Kulkarni 2007).

Maturity models typically have levels that are characterised by specific requirements and one level follows on another in a sequential manner (Weerdmeester et al. 2003). Usually, incremental layers of perfection determine the order of each level, and some models have punctuated equilibrium (Sabherwal, Hirschheim & Goles 2003:331). Entities are typically measured as they move upwards or progress forward to the next level. As a rule, levels cannot be skipped. Most maturity models have common characteristics such as people, process and technology. For the purpose of this study, Kulkarni's (2007) maturity model was adopted (Figure 1).

Kulkarni's (2007) model was best suited because it incorporated the KM enablers that emerged in this study's theoretical framework.

Knowledge management enablers and the importance of trust

There are certain key KM enablers required for effective KM practices to be in place and poor focus on any of the enablers can act as a barrier to KM. Four common enablers of KM

KNOWLEDGE MANAGEMENT MATURITY MODEL					
Maturity level	LEVEL 1 KM is possible	LEVEL 2 KM is encouraged	LEVEL 3 KM is enabled/ practised	LEVEL 4 KM is managed	LEVEL 5 KM is improved
KMI					
Perception on value of knowledge					
Lessons learned					
Leadership					
Knowledge sharing culture					
Infrastructure and tools					

KM, knowledge management.

Source: Kulkarni, U., 2007, 'Knowledge management capability', *Journal of Knowledge Management* 11(6), 94–109. <https://doi.org/10.1108/13673270710832190>

FIGURE 1: Knowledge management maturity model.

emerged from the literature, namely leadership, people, culture, and information technology (Almudallal et al. 2016; Esterhuizen 2012; Renzl, Matzler & Mader 2016; Zhang 2014). Also, researchers stressed the importance of trust in knowledge sharing. In this study's context, trust refers to the confidence people have in knowledge shared by other people. The impact of trust on knowledge sharing among employees in public service is significant (Zhang & Jiang 2015:277–290).

Trust, as defined in this study, is the degree to which a person is willing to acknowledge another person's intention as good (Renzl et al. 2016:7). For example, the IBM Institute for Knowledge-Based Organizations (2002:1–11), conducted a study on the relationship between knowledge sharing and trust. They make a distinction between two types of trust, namely benevolence-based trust and competence-based trust. The commonly known trust is benevolence-based, in which an individual will not intentionally harm another, given a chance to do so. However, in knowledge sharing, competence-based trust plays a pivotal role as it is the pillar of a relationship in which an individual believes that another person is a subject matter expert in a specific area (IBM 2002:8).

Trust, commitment, cost, and the need to innovate and improve existing practices are the enablers that influence knowledge sharing (Adner & Snow 2010:76; Casimir, Lee & Loon 2012:740). The literature reviewed in this study included the case studies and formative research of Galliers and Leidner (2014) and Galliers and Stein (2018), which contributed to the list of aspects included in KM maturity mapping for this study (see Appendix 1):

- Clear communication generally contributes to trust within a business unit.
- KM goals have to be specifically communicated to all in the organisation.
- Organisational values support knowledge sharing in a business unit.
- Expert knowledge is valued and rewarded.
- Training has to be regularly scheduled to bridge knowledge gaps within a business unit.

In this study of maturity mapping for continuous improvement of the RSI, a priori was that its ICT strategy planning comprise strategic information management (SIM) principles. The application of SIM in the internal and external business environment improves leadership, innovation and continuous business improvement (Galliers & Leidner 2003:9; Galliers & Stein 2018).

The underlying premise of this study was that good KM practice, which includes SIM, leads to efficiency, effectiveness and continuous improvement. The principles that the RSI should consider in order to increase its KM maturity were established from literature and tested in practice. KM theory and the adoption of Kulkarni's (2007) maturity model in this study formed the KMMM used as the test instrument in the empirical study.

Research methodology

An empirical study followed on the literature study of the role of KM in organisational learning for continuous improvement. The researchers considered how to measure maturity in different domains and then identified KM maturity indicators (KMIs) based on their function as KM enablers. The approach was deductive and used descriptive statistics. The research findings were utilised in a quantitative research approach (Figure 2).

The research philosophy was positivism, focusing on cause and effect, which assisted the researcher to make deductions. Characterised by cause-and-effect epistemology, the study singled out one business unit in the RSI value chain as opposed to the entire organisation. In terms of this study's reliability and validity, it is important to note that the study did not consider all aspects of all existing KMMMs. Instead, the relevant levels and indicators were pertinently covered. The study did not include the elements of strategy and processes of the entire organisation, it only covered limited scope focusing on KMIs that would be most relevant to the selected business unit function of the RSI (Figure 3).

Figure 3 illustrates the RSI's high-level value chain in order to position this study's unit of observation in terms of its participation as a business unit with the role of assessment of tax, namely individual and company audits. Sound judgment is required based on facts and interpretation of the country's tax law, which makes this business unit ideal for maturity mapping.

Research design

The case study method, with a questionnaire categorised in KMMM themes, tested the levels of capability according to

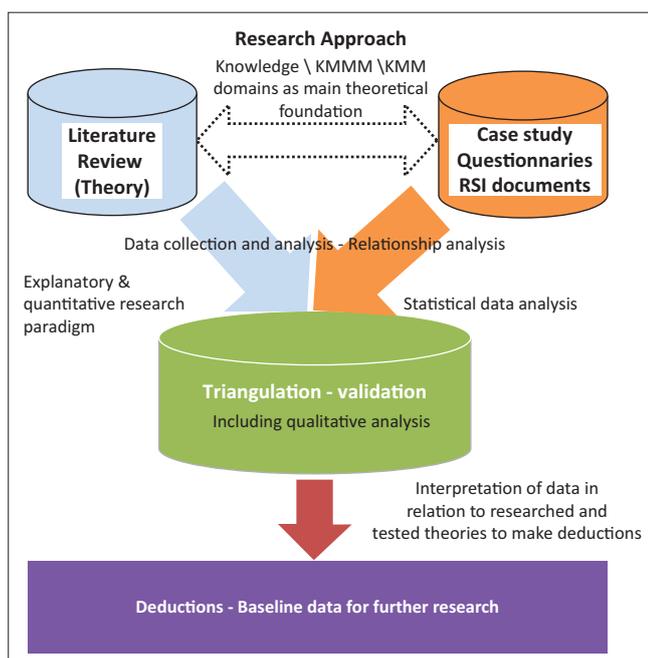


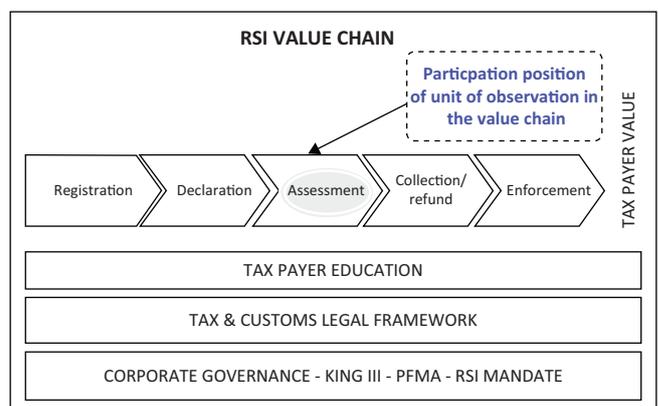
FIGURE 2: Research approach.

specific themes. Based on Leedy and Ormrod's (2010:187) description of the case study research design, a case study was most suited to obtain information relating to participants' perception categories and levels of KM maturity within the RSI. The literature review produced KMIs and KMMM themes, used to test capability levels on how the value of knowledge was perceived, the value of sharing lessons learned, leadership role in creating an enabling environment, knowledge sharing culture, and the availability of technology and processes for KM within the RSI (Mthembu 2016).

More specifically, research focus was on the tax compliance business unit, which is a sub-unit of the Tax and Individual Business Unit mainly focusing on ensuring compliance with regard to taxpayer records and tax affairs. This unit has a national footprint located in all branch offices, which deals with assessment of all direct and indirect tax declarations that are complex and require human intervention and expertise. It has tacit knowledge acquired through experience and learning plays a pivotal role in service quality and improvement of turnaround times. This unit's core business deals mainly with the interpretation of tax laws in order to perform accurate assessments and the high reputational risk puts pressure on management; therefore, it is best suited for this case study.

Research sample

The first order of sampling criteria applied the purposive sampling technique, which required individuals who in their daily assessment of tax compliance were utilising mostly tacit knowledge to resolve complex cases within stipulated service levels. The Compliance Unit was selected for participation in this research. The second order of sampling criteria made use of simple random sampling to involve managers, auditors, quality assurers, and specialists within each stratum (Mthembu 2016). Every member had an equal chance of being selected (Leedy & Ormrod 2010:207), which is characteristic of the positivist research paradigm. The sample size was 126 which is 40% of the entire business unit. In order to be able to generalise the research findings, the sampling method had to be appropriate and the sample size had to be exact in order to ensure representative results (Fox 2009:8).



RSI, revenue services institutions.

FIGURE 3: Revenue services institutions value chain.

The targeted sample was 126 respondents and 102 responses were received, resulting in a response rate of 81%.

Data collection and analysis techniques

Mono-method data collection was performed using an electronic questionnaire created with freeware (Survey Monkey). Participants had to give specific responses of yes or no to statements given, depicting different levels of maturity, specifically for themes on perceptions of the value of knowledge, lessons learned, leadership role, culture, and trust. Research ethics guided the data collection process, which meant a formal request for consent was sent to the executive of the Compliance Unit after having discussing the research and the value it proposed to the RSI. Only after obtaining consent, did the executive distribute the questionnaire to senior managers, requesting them to distribute to their team members. The voluntary nature of participation at individual level and the contract of confidentiality allowed candid participation.

Descriptive statistics in the form of frequencies, proportions, and means were obtained from the data to describe the patterns and trends in the data set. The chi-square test of homogeneity was used to determine whether there was uniform distribution of responses across categories, that is, whether the proportions were equal across categories (Mthembu 2016). In addition, the chi-square test of homogeneity tests the claim that different populations share the same proportion of specified characteristics (Brase & Brase 2015). In this case, the chi-square test of homogeneity was used to determine whether the proportions of those who said 'yes' was different from those who said 'no'.

Composite variables were created by looking at the KM maturity aspects and the number 1 was given to the expected response whereas a 0 was given to a response that was not ideal in KM. The composite variable was obtained by summing the 1s to give a composite variable for 'value of knowledge', 'lessons learned', 'leadership role', and 'trust'. The total scores were: 'value of knowledge' 12, 'lessons learned' 11, 'leadership role' 11 and 'trust' 6. High scores characterised more value of knowledge, more lessons learned, more leadership role, and more trust. The mean was used to describe the composite variable.

The questionnaire was conducted over a 7-day research period. The complete research study was undertaken over a 3-month period, as the outcome of KM maturity mapping was required by the RSI to serve as input to a business case. The data were entered in Microsoft Excel and exported to Statistical Package for the Social Sciences (SPSS) version 24 for analysis.

The reliability of the instrument was measured using Cronbach's alpha, that is, its internal consistency. According to Salkind (2014), internal consistency is a measure of reliability, which examines the unidimensional nature of a test. The degree of reliability was measured using the

guidelines provided by Revelle and Zinbarg (2009), where reliability of 0.9 or higher is excellent, between 0.8 and 0.9 is good, 0.7 to 0.8 is acceptable, 0.6 to 0.7 is questionable, between 0.5 and 0.6 is poor, and less than 0.5 unacceptable. According to Hair et al. (2014), the general agreed limit is 0.7, although in explanatory research it might decrease to 0.6. The reliability of the data was calculated to assess the effectiveness of the measures to measure the value of knowledge, lessons learned, leadership role and trust. No item had low reliability and thus all items were retained.

Ethical consideration

The study gives revenue services institutions insights in how to innovate and sustain their value creation to their stakeholders. Based on empirical findings we state the desired activities for adoption of a knowledge management framework that will help achieve continuous improvement (at the South African revenue services institution, with their permission to publish the results). The ethics committee permit number is UJFOM_IKM2016_11_809571098.

Discussion of key findings

Findings are consolidated to map KM maturity by consensus comparison across the five levels of the KMMM, adopted from Kulkarni (2007), summarised in this article in terms of the value of knowledge, lessons learned, leadership role and trust. The five levels are:

- Possible – abbreviated in figures as L1
- Encouraged – abbreviated in figures as L2
- Enabled/Practised – abbreviated in figures as L3
- Managed – abbreviated in figures as L4
- Continuously improved – abbreviated in figures as L5

Findings in Figure 4 illustrate that the value of knowledge is well understood and knowledge assets as infrastructure are well identified. At the lowest level of the capability maturity scale, consensus is high at 93%. However, a reverse pattern is observed as consensus drops sharply at Levels 2, 3 and 4 by an average of 30%, and there is a further drop by 20.1% at Level 5. It is noted that at the lowest level of capability maturity scale, 6.9% of respondents did not concur; this

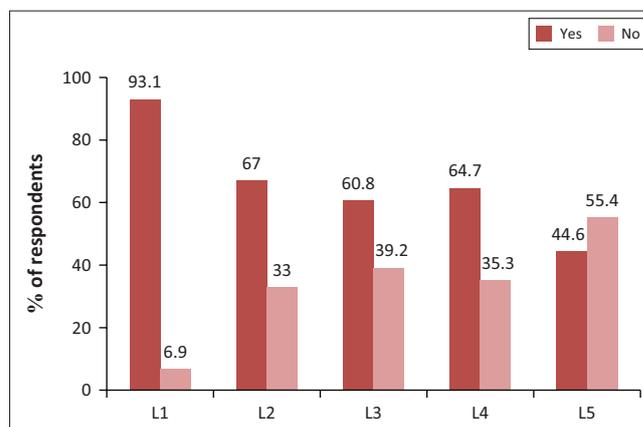


FIGURE 4: Value of knowledge.

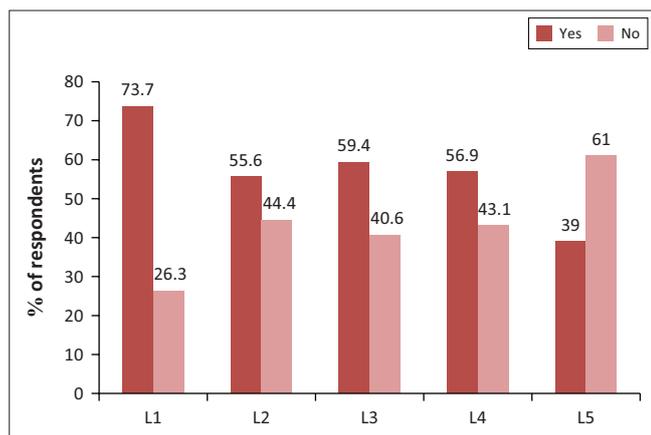


FIGURE 5: Value of capturing lessons learned.

difference could be attributed to new employees or to lower levels of education. This picture depicts that the value of knowledge is well understood. Less effort is required in communication; it may only be required to sustain it at enterprise level.

From juxtaposing Levels 2, 3 and 4, one can see a pattern: that there are higher levels of disagreement indicating that there is no consistency and that is an indication that different roles perceive these levels differently and, therefore, leadership must take responsibility in inculcating a culture of knowledge sharing for better return on investment in intellectual capital. Leveraged intellectual capital is the result of shared lessons learned. However, if knowledge is not shared, then an organisation is poorly positioned for continuous improvement.

Figure 5 illustrates the perceived value of capturing lessons learned and sharing these lessons to ensure continuous improvement. Juxtaposing the value of knowledge and lessons learned, one can deduce that while the value of knowledge is well perceived, the level of consensus drops as the actual flow of knowledge within the business unit is measured. Also, the level of consensus on Levels 2, 3 and 4 seems to flatten indicating that progress is made across levels, but that the contrasting view is significant enough to warrant interventions. Figure 5 presents evidence that there is effort in KM implementation, although one cannot generalise it to the entire organisation or the public sector as a whole. Findings confirm the theory of barriers of KM within the public sector (e.g. see Appendix 2, the chi-square test of homogeneity).

Findings in Figure 6 indicate the perceived role of leadership in creating an enabling environment for knowledge sharing is critical. The only levels with consensus are Levels 1 and 2; the rest indicate the perception that leadership is a barrier to knowledge sharing.

In maturity mapping, the level of consensus indicates the level of maturity. In summary, the respondents' level of consensus about the value of knowledge and lessons learned, is above 70% only with respect to the first level of KM maturity. This indicates that KM exists despite the barriers

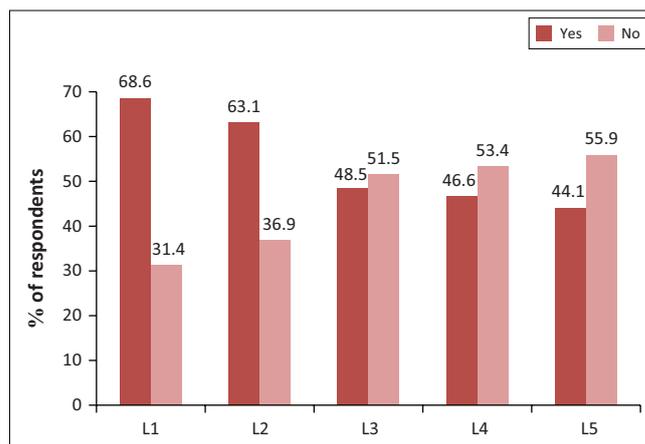


FIGURE 6: Leadership role in knowledge sharing.

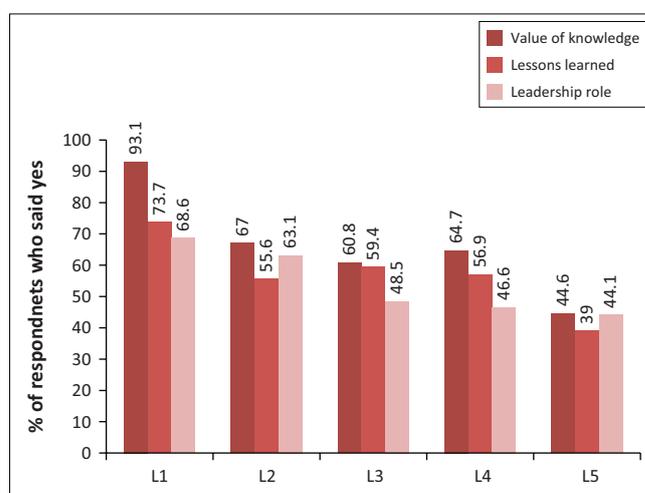


FIGURE 7: Summary of level of consensus of how the value of knowledge is perceived.

that persist. The pattern observed is a drop in level of consensus as the maturity levels move from Level 2 to Level 5. Figure 7 shows that while the value of knowledge is well perceived, the sharing of knowledge is not at a desired level and leadership needs to assume a primary stance, leading the process in order to enable knowledge sharing for continuous improvement.

The study developed a conceptual KM framework for the RSI, based on the research findings (Figure 8).

Mapping KM objectives both at strategic and tactical levels will ensure that all KM projects contribute towards organisation strategic outcomes. The same outcome may be achieved at tactical level by cascading KM objectives to specific operational objectives. Finally, analysis and interpretation of the research findings helped with identifying some desired activities for the adoption of the proposed framework, mentioned in the conclusion of this article.

Conclusion

Given that only a few business units were evaluated in the case institution, the results in this study are limited in generalisability with RSIs. The RSI is on the baseline of

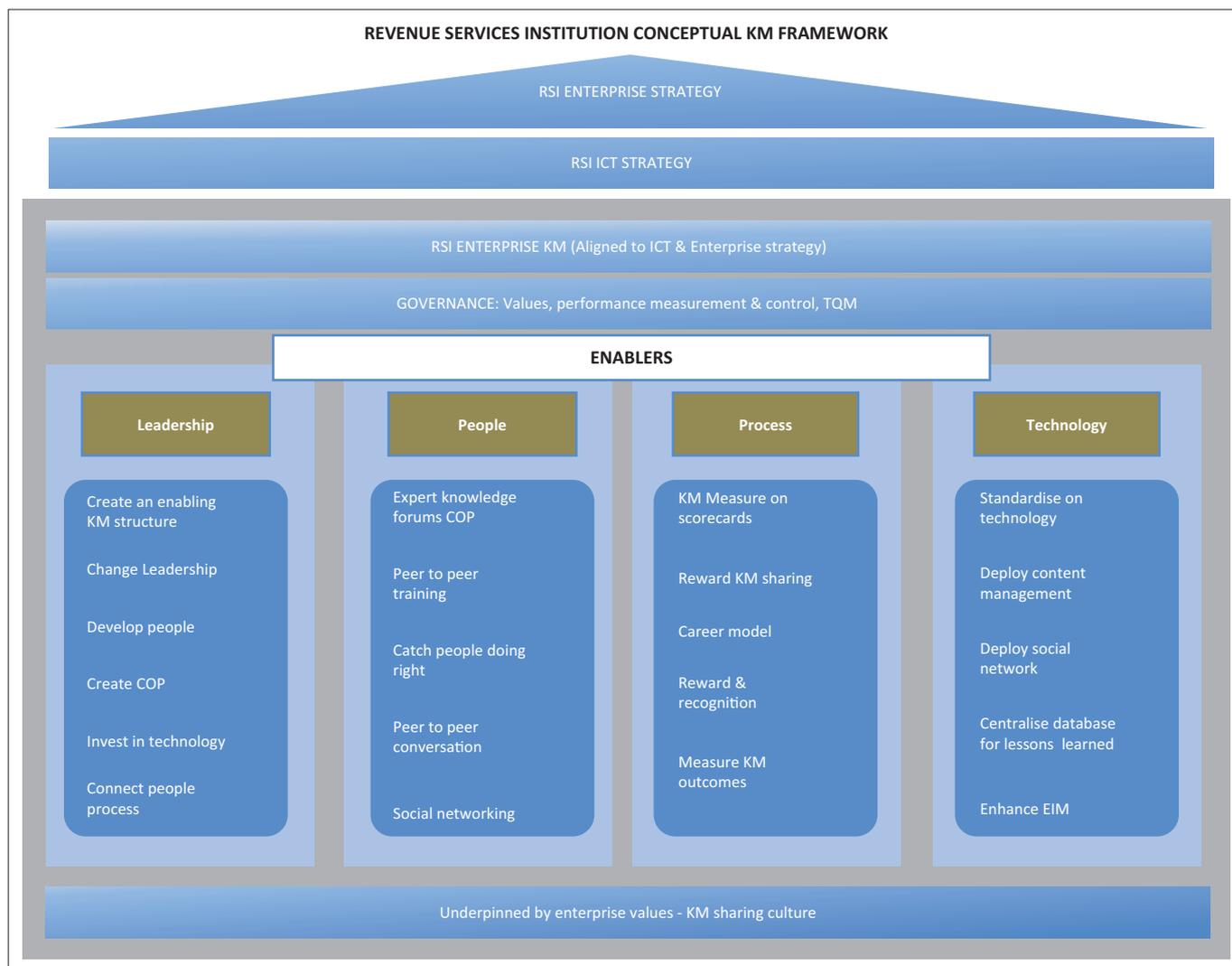


FIGURE 8: Conceptual knowledge management framework for a revenue services institution.

Level 3, that is, the Enabled/Practised level of KM maturity. While knowledge is valued at the RSI, KM is partially practised and enabled. This study indicates specific action steps that are required in order to reach the desired levels of maturity that lead to continuous improvement. The areas for improvement emerged, namely training, leadership role, trust, reward, and recognition, as well as embedding KM by implementing processes, policies and procedures. The recommendation is adoption of the conceptual KM framework presented in Figure 8, to be used as pilot, and, if successful, adopted at enterprise wide level. The recommendation builds on SIM principles, which are public sector specific:

- Pareto principle, namely low effort and high impact.
- Ease and cost of implementation.
- Use of existing infrastructure and processes.
- Blueprint for enterprise wide implementation.
- Continuous improvement focused.
- Alignment to departmental objectives.
- Bottom-up process to ensure employee engagement.
- Measurable outcomes.
- Direct impact on services level improvement.

The desired action steps include, firstly, develop KM measures and include them on performance scorecard; secondly, establish baseline turnaround times for specific individuals and map to service levels and turnaround times; thirdly, roll out a training plan for the business unit and map outcomes to service turnaround times; lastly, develop a KM strategy and initiate a KM implementation project. In this regard, the critical success factors that emerged from this study include:

- Leadership must lead the process of implementation.
- Time is allocated for sharing of lessons as part of daily work.
- Engagement of all members of the business unit.
- Lessons learned are recorded and centrally stored for easy retrieval.
- Measuring success as part of organisational performance process.
- Human capital engagement and buy-in.

The lesson learned from this study is the importance of using a model that is appropriate, specifically for RSIs. Suggestions for future studies require cognisance that validating or disproving assumptions of a benefit such as cost saving may

help in gaining KM maturity levels at a specific point in time but it is not necessarily a true representation of facts representing behaviour of the institution over a long period of time. A change in one of the variables used during assessment could change the outcome over a shorter period; one such example is a change in leadership or leadership style. This could shift levels of consensus positively or negatively over a short period in time. In conclusion, KM maturity is necessary for continuous improvement, which is a precondition of business excellence.

Future study

This study was the first of its kind in the case institution and the first step was to develop a conceptual framework for measuring perceived KM maturity levels of the case institution's Tax Audit Business Unit. From an academic viewpoint, the foundation work was critical. Future studies should include a more comprehensive verification experiment, for example an in-depth case study.

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Competing interests

One of the authors is a permanent employee of the revenue services institution and presented the research findings to the particular business unit in order to ensure a true interpretation of data and presentation of information. The authors declare that they have no financial or personal relationships that may have inappropriately influenced them in writing this article.

Authors' contribution

M.M. was a MCom student in 2016 and drafted the article from his dissertation. T.d.P., supervisor of the MCom student, converted the draft into a manuscript ready for peer review.

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Appendix 1

Knowledge management maturity indicators

This appendix relays the original question numbers (Tables 1-A1, 2-A1, 3-A1 and 4-A1). The complete data collection instrument is available on request.

TABLE 1-A1: Question 6: Value of knowledge.

Capability level	Number	Statement
1: Possible	1	Gaining knowledge about my job is encouraged in my business unit.
	2	Knowledge always adds value to my daily work.
	3	People in my team share knowledge willingly.
2: Encouraged	4	My manager encourages knowledge sharing.
	5	In my business unit it is within our culture to share knowledge.
	6	I am rewarded for sharing knowledge within my team.
3: Enabled/ Practised	7	In my business unit there are knowledge management objectives.
	8	In my daily activities I am expected to share knowledge with my team members.
4: Managed	9	I find it easy to share knowledge with my team members.
	10	My scorecard has knowledge sharing measures.
5: Continuously improved	11	I use tools to manage knowledge acquisition and sharing.
	12	There are processes, policies and procedures that are used to manage knowledge acquisition and sharing.

TABLE 2-A1: Question 7: Lessons learned.

Capability level	Number	Statement
1: Possible	13	Sharing lessons on successful and less successful work methods is encouraged in my business unit.
	14	My team members readily share lessons learned on task well executed.
	15	All team members understand lessons learned help the team in improving work quality and turnaround times.
2: Encouraged	16	My manager encourages sharing of lessons learned for continuous improvement.
	17	In my business unit it is a norm to share lessons learned.
	18	I am rewarded for sharing lessons learned and new ways within my team.
3: Enabled/ Practised	19	In my business unit, sharing lessons learned is part of daily workflow activities.
	20	In my team all members of team readily share all lessons learned.
4: Managed	21	I find it easy to share lessons learned with my team members.
	22	I am measured on sharing lessons learned.
5: Continuously improved	23	There are systems, tools, processes, policies and procedures that are used to store, share and access lessons learned (e.g. knowledge folders, collaboration tools, etc.).

TABLE 3-A1: Question 8: Leadership role.

Capability level	Number	Statement
1: Possible	24	Knowledge management is regarded as important for business unit success and service delivery.
	25	Leadership takes the initiative of communicating the importance of knowledge management.
	26	Leadership motivates knowledge experts to share knowledge with all in the business unit.
2: Encouraged	27	Leadership encourages learning from successes and failures.
	28	Leadership communicates both success and failures of the business unit activities.
	29	Leadership only communicates successes to business unit.
3: Enabled/ Practised	30	Leadership willingly shares all experiences with the business unit.
	31	Leadership only encourages sharing of knowledge specific to related task.
4: Managed	32	Leadership monitors information and knowledge sharing as a norm.
	33	Leadership ensures that there are knowledge management policies and procedures in place for knowledge flows.
	34	Leadership appraises the impact of knowledge sharing tools and databases to ensure storage and retrieval of knowledge.

TABLE 4-A1: Question 9: Trust.

Q	Statement
9.1	Knowledge management goals are clearly communicated to all in the business unit.
9.2	Knowledge management goals are clearly communicated to all in the organisation.
9.3	Organisational values such as integrity, respect and honesty support knowledge sharing in our business unit.
9.4	Expert knowledge is valued and rewarded.
9.5	Training is regularly scheduled to bridge knowledge gaps within business unit.
9.5	Team members frequently share knowledge among themselves.

Appendix 2

Example of data analysis

The chi-square test of homogeneity was performed to determine whether the difference between the categories, yes and no, were significant, that is, to determine whether frequency counts are distributed identically across a variable at the 5% level of significance (Table 1-A2).

The hypothesis tested was:

H_0 : There is equal distribution of responses across categories on value of knowledge capability area Level 5 – Continuously improved.

H_1 : There is no equal distribution of responses across categories on value of knowledge capability area Level 5 – Continuously improved.

TABLE 1-A2: Chi-square test on value of knowledge when at Level 5 – Continuously improved

STATEMENT	Chi-value	<i>p</i>	Decision
Q6k. I use tools to manage knowledge acquisition and sharing.	0.353	0.552	Do not reject the null hypothesis
Q6l. There are processes, policies and procedures that are used to manage knowledge acquisition and sharing.	2.510	0.113	Do not reject the null hypothesis

, $p < 0.05$; *, $p < 0.01$

Note: Goodness of fit test of homogeneity on value of knowledge when capability level is continuous improvement

In this case all p -values were more than 0.05, indicating that there was no significant difference between the proportion of respondents who agreed and those who disagreed on issues of value of knowledge in continuous improvement. Thus one can conclude that there are mixed feelings within the RSI. Mixed feelings are an indication that tools, processes and procedures are not consistently used across the business unit. The fact was that enterprise ICT strategy revealed lack of enterprise-wide analysis technology as well as collaboration tools. It can be concluded that the tools are used in silos and not enterprise-wide. At this capability level, it is expected that the processes are enabled through technology for continuous improvement purposes.