Gibaran Journal of Applied Management
Volume 4

March 2011

Developing a knowledge management effectiveness model for local governments

Karen White[1]
Chris Riley[2]

Abstract

This paper reports on research undertaken within local government in South Australia to determine how Information and Communications Technology (ICT) can be used effectively for knowledge management. Convergent interviews with a range of industry experts and case research interviews with a range of local government managers, provided a base of experience from which to develop a four-dimensional model of knowledge management for determining the effectiveness and success of managing knowledge in local government. The findings indicated that individual councils within local government had difficulty in defining their specific knowledge management needs; and although there was a consensus that ICT can be used for the effective management of knowledge, the factors of culture, business processes and methodologies were relevant to its use. The value to local government in using this model includes improved knowledge sharing and retention leading to more informed and timely decision-making. These benefits will be achieved as knowledge management practices are embraced by its people, delivered through ICT and incorporated into methodologies and business processes.

Key words:

Information and communications technology, local government, knowledge management

[1] Manager Information and Communications Technology and Knowledge Management, City of Marion, South Australia and Research Associate at Gibaran Graduate School of Business

[2] Research Fellow at Gibaran Graduate School of Business

Developing a knowledge management effectiveness model for local governments
Karen White and Chris Riley

Introduction

Local governments in Australia provide economic, social and environmental support for their communities. These local governments are accountable to the community, and to state and federal governments. For example, the 68 local government councils in South Australia operate within several legal frameworks that include the *Constitution Act 1934* (SA), the *Local Government Act 1999* (SA) and the *Local Government (Elections) Act 1999* (SA). These Acts are underpinned by a four-yearly election process that supports the representative nature of local government councils (LGA 2009). Through community engagement, councils are required to report Annual Business Plans that articulate a strategic direction for the future to state and federal legal and administrative review systems (LGA 2009).

The convergence of Information and Communications Technology (ICT) trends and applications, such as online payments and mobile and wireless communications, could assist local governments to achieve their reporting functions more quickly and effectively (Hoving 2007). These ICT operations can be effectively linked to the strategic direction of the organisation; information can be captured and retrieved as knowledge and distributed as required. Thus ICT could become an enabling technology for knowledge management. Knowledge management focuses on cultivating and sharing complex knowledge held by individuals within an organisation, and differs from information and records management in that it is people and not system focussed. Knowledge needs to be incorporated into ICT systems so that the knowledge continues to exist after the people are no longer available (National Archives, Advice 56, 2002).

Thus this research aims to determine how ICT can be used effectively for knowledge management in South Australian and other local governments. The achievement of effective knowledge management will encourage sharing of information and collation of knowledge across local government, residents and related industries. Our contributions are the first examination of these issues; and the development for the first time of a model of knowledge management to determine the effectiveness of managing knowledge in local government.

The first section of this article details the background of the research, and then the two-stage research methodology is described. Data analysis follows, including the development of the knowledge management effectiveness model that can be utilised by local governments.

Background of the research

The State Records Act 1999 is the statute requiring state and local government in South Australia to classify documents (records) that are deemed to be of public or corporate value. For local government, this requirement includes archiving and disposing of records as determined by the *General Disposal Schedule 20* (GDS20) to be no longer valid or required by law (State Records 2004). The State Records legislation is otherwise silent about specific requirements for the management of knowledge.

In turn, ICT systems in local government store and maintain necessary data for the retrieval and management of information for business tasks and reporting, and there are functions and best practice models that allow effective management of systems and information. However, there are no statutory requirements in place to guide individual councils or local government in the management of data and systems. Neither the GDS20 nor best practice models encompass the management of knowledge in an ICT system for local government. This research sought to determine how knowledge management could use ICT to assist with the process of data collection and collation in a timely, efficient and effective manner and how analysis of the data would provide optimum quality and quantity of information for the business functions within local government.

Two stages of methodology

The two stages of this research consisted of convergent interviews and case research. To understand the alignments between ICT and knowledge management, stage 1's *convergent interviews* (Rao & Perry 2003) were conducted with **industry experts** to confirm and clarify

the key issues. Convergent interviews were most suited to this research because they provided a way of quickly converging on key issues in the area, it was an efficient mechanism for data analysis after *each* interview, and included a way of deciding when to stop collecting data. Stage 1 experts were business owners, consultants and senior executives in the fields of information and knowledge management and associated technologies. The four interview respondents are represented in this report as R1, R2, R3 and R4.

Based on their responses, stage 2's *case research* interview questions were developed. This research involves a 'how' question with complex multiple cases, and the case research methodology established a framework for discussion and debate to trace sequences of events and discover key experiences and relationships. Using the methodology ensured that the data was trustworthy and would lead to reliable and dependable analysis and credible outcomes (Stokes & Perry 2007). Stage 2 respondents included senior managers from small (rural) to large (metropolitan) local councils and the Australian Local Government Association (ALGA) and are represented in this report as R5, R6, R7 and R8. As is common in case research, all the local government managers in stage 2 were asked the same questions.

In both stages, qualitative, semi-structured one-on-one *interviews* were conducted (Gaskell 2000). Interviews provided the flexibility to allow all issues related to this research to be identified and explored. A formal approach was used with appropriate interview guides/protocols for both stage 1 and stage 2 interviews. Respondents were encouraged to talk about any relevant experiences or issues that they believed were important to ensure that the data from multiple cases were included. The interviews were semi-structured and flexible in nature to ensure critical factors discussed by respondents were explored. Thus the interview interactions were story-telling rather than controlled answering to specific questions. In brief, the interviews were useful for revealing the story behind a respondent's experiences and pursuing in-depth information (Yin 2004).

Consider the two stages in more detail. The *stage 1* convergent interviews consisted of a series of in-depth interviews with industry experts. Questions were refined after each interview, converging on the issues in a topic area and expanding on the information gathered. There were four initial questions; all designed as open questions in order to capture as much information as possible. After the first interview, questions were added to ask about issues raised in previous interviews, so that agreements and disagreements among the interviewees could be considered, and checked in the next interview. The flexibility of convergent interviewing arises out of this continuous refinement of content and process. The interviews stop when stability is reached, that is, when agreement among interviewees is achieved and disagreement among them is explained on all the issues (Naire & Riege 1995). During this process of convergent interviewing, a further seven issues were raised to capture more in-depth information in the later case research questions. Table 1 shows this process in diagrammatic form, including the end point of stability on all issues.

Table 1 **Pattern of stage 1 convergent interview issues, by the industry expert respondents**

Issue / Respondent	1	2	3	4	5	6	7	8	9	10	11
1	✓	✓	✓	✓	Raise	Raise					
2	✓	✓	✓	✓	✓	✓	Raise	Raise	Raise		
3	✓	✓	✓	✓	✓	✓	✓	✓	✓	Raise	Raise
4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Note: Details of the issues raised in the interviews are available in the research database available on request. A tick signifies an issue that was taken into each interview by the researcher and 'Raise' signifies a new issue raised by the interviewee of each row. The eleven issues were the basis of the interviews in stage 2.

Source: Analysis of interview data.

Refining the issues from stage 1 for use as questions in the case research methodology of *stage 2* ensured that as far as possible, the data was valid, and led to reliable and dependable

analysis with credible outcomes (Stokes & Perry 2007). All responses from stages 1 and 2 were collated to create the complete picture below. The diversity of responses from the stage 1 industry experts and stage 2 local government managers, and from the different types of backgrounds of interviewees in each stage, enriched the research, allowing comprehensive and comparative analysis. The interview findings eventually led to the identification of opportunities for improvement for local government in the management of knowledge through the use of ICT.

Analysis of interview data

Analysis of the interview data was undertaken in three steps:

1. discovering what interviewees understood by the two foundation terms of ICT and knowledge management
2. uncovering the four dimensions about the linkage between ICT and knowledge management
3. identifying how those dimensions could be measured, in a pyramid model.

Step 1: foundation terms. The two foundations of the model developed in this research are ICT and knowledge management. To begin, the respondents revealed that *ICT* is robust and able to capture and store data. Councils have legislative and moral obligations to deliver services for the community such as animal and asset management, customer requests and management of records, documents and financial information (LGA 2004). The local government respondents agreed that the information required for these services is stored in disparate electronic and manual systems. Also agreed was that ICT is the enabler for the management of the information and has an important role to play for council operations. 'The the role of ICT for councils is business continuity, and to maintain business continuity, ICT must have effective recovery plans for system breakdowns' (R6).

Nevertheless, all respondents felt that the role of ICT was *not* the key role for the management of knowledge. Comments like 'simply a vehicle' for 'capture of data for

retrieval' that 'allows knowledge management practices to be implemented' ranged across all responses. ICT was seen as merely the 'tool' that contributes to knowledge by providing systems for data capture and storage, enabling retrieval of data, information and knowledge. 'Pure ICT does not have the human factor', and therefore has no inherent ability to tell stories or transfer knowledge (R4).

In brief, the interview data supports the notion that ICT systems are robust and could meet knowledge management needs. The local government respondents think that ICT *could* facilitate the transfer and sharing of knowledge across a local government and that sharing knowledge between councils was necessary for strategic decision-making (R7). But councils were not ready to share knowledge because there was a fundamental need to identify the individual council's knowledge management requirements as the first priority (R6, R8), as explained next.

After ICT, the second foundation concept of *knowledge management* had to be clarified. First, 'what is knowledge management?' All interviewees recognised the importance of capturing the information that resides in 'people's heads' or the organisation's workforce. Furthermore, knowledge management was described as a process or system to capture this information that can then be 'called upon' as required. Culture and technology work 'together in a non-invasive manner to capture individual's knowledge and make it available in a range of formats to the organisation' (R1). Knowledge management includes 'snippets' of information, that when gathered together form the DNA of an organisation and are able to be retrieved as required (R4).

Despite this agreement, processes of knowledge management strategies are informal – the term knowledge management was a recognised term for many executives and organisations but there was no agreed 'meaning' or substance behind the term for many organisations (R1 and R3). Informal processes for knowledge sharing between employees were provided by the physical infrastructure (talk spaces, couches and round tables), rather than by structured

desk environments to encourage discussion and sharing. Another relatively informal process was to provide 'free sessions' for staff to talk and brainstorm ideas and to discuss how to resolve issues.

With knowledge management defined, we can consider its importance. All respondents indicated that knowledge management was important - both strategic and day-to-day mistakes are made because people do not have access to the knowledge (R1). However, even though knowledge management was important, it was not a priority for councils; it was 'barely on the radar' for local government (R6, R8). Analysis of responses from the local government experts showed that local government is 'still a bit rough and ready' (R7) when it comes to understanding the management of knowledge. An example for local government given by R7 was the management of land use and housing developments. In the absence of supporting data, previous council decisions made for housing developments had been made without full knowledge of the effect on the city's master plan for land use. Decisions were not based on data analysis or knowledge but, according to R7, were influenced by personal preferences, whims and fads at the time.

Culture was also discussed by all respondents as a driver for knowledge management in any organisation. The stage 1 industry experts felt that flat organisation structures and open dialogue supported team-work and workplace flexibility and gave people the opportunity to share knowledge. An organisation's culture that allows people to articulate their information and knowledge requirements was on the right path to enable ICT systems to respond to the needs (R2, R3). Once these needs are satisfied, knowledge sharing will be like a 'virus' spreading through the organisation (R3). However, the most significant factor for knowledge management is that an 'appetite' for knowledge devoid of personal preferences should exist; without it, the culture would resist knowledge sharing and a commitment to knowledge management.

The ALGA sponsored the development of the *Local government knowledge management toolkit* (KM Toolkit) in 2004 with the aim of assisting councils to build their capacity to recognise opportunities for sharing, discovering and managing knowledge. The KM Toolkit acknowledges the importance of capturing knowledge at a council level, does not purport any system-based solutions, and recognises that there is not a one-for-all fit (ALGA 2004). It was agreed by all respondents that the KM Toolkit was a starting point for the identification of knowledge for councils, but it had not been implemented. For example, stage 2 respondents were aware of the KM Toolkit developed by representative councils for the ALGA in 2004, but were not aware of any council that had implemented this toolkit. The KM Toolkit is an appropriate framework that could be used by the organisation to determine knowledge management best practice and identify opportunities for improvement (R7). However, no feedback from the State's local governments indicated any council had used the KM Toolkit in preparation of a knowledge management initiative or strategy; and there are no plans to update or review the KM Toolkit (R7).

During the analysis of data and clustering of ideas, four distinct categories emerged as detailed in Table 2. The first of these categories was ICT for technology and information storage and retrieval. Next was business process that included working towards continuous improvements involving resources and day-to-day decision-making. The third category was culture, the willingness of people to share knowledge; and the last category concerned methodology - the components and methods of conducting business.

Step 2: four dimensions of effectiveness. On the foundations above, an effectiveness model could be considered for development. As noted earlier, the interviews were wide-ranging. Their findings were sorted, allocated and summarised into these four dimensions to determine how local government can be effective in the management of knowledge: ICT, business process, culture and methodology. That is, themes and patterns were discerned in the interview data, and a summary of the four dimensions uncovered is detailed in Table 2. Briefly, knowledge management is more than the first dimension of ICT, and ICT solutions

are already available to enable knowledge management strategies and methodologies. However, these solutions cannot be effective for knowledge management without linkages with the other dimensions of effective business process, culture and methodologies. Commitment to all of the four dimensions is necessary for effective knowledge management.

Table 2 **Four dimensions developed from the interview data that determine the effectiveness of knowledge management in local government**

Dimensions	Theme
ICT	• ICT is not the main focus for the management of knowledge • there are a number of disparate information systems in councils with little connectivity between the systems • convergent technologies link ICT to knowledge management • appropriate ICT format for storage and retrieval of knowledge
Business process	• the KM toolkit is known but not utilised by councils in South Australia • ICT develops the 'linkages' between people and knowledge and is the enabler for knowledge management • knowledge management requires definition, resourcing and training • decision-making would be more informed and timely if there was access to knowledge • knowledge management is not formally resourced by local government in SA
Culture	• the organisation culture and the willingness of the people to embrace knowledge management initiatives is fundamental to success of knowledge sharing
Methodology	• the success of knowledge management systems relies on technology and the organisational culture to capture, reuse and transfer knowledge • culture, time and conflicting priorities are significant constraints in applying funding and realising ROI for councils • story telling is the best form of knowledge sharing and transfer

Source: analysis of interview data.

The first of the four dimensions for successful implementation of knowledge management is **ICT.** The ICT function in local government traditionally has the role for maintaining, supporting and providing information and communications technology. Due to the lack of legislative requirements, many organisations adopt a best practice approach to ICT service delivery. ICT is able to capture all forms of data; the challenge is retrieval of the data as knowledge. Councils have data in disparate systems that, with relevant technology, can be displayed as knowledge. While the definitions for knowledge vary within the literature, it appears there is general agreement that knowledge is more highly valued than data or information. Knowledge incorporates both data and information, and leads to action when applied to individual experience (Nguyen, Smyth & Gable 2004). The effective

incorporation of knowledge management in ICT service delivery, however, requires an understanding of the business need for knowledge management.

The industry experts support the literature and referred to concepts such as social computing and unstructured physical work environments that allow people to share and discuss ideas. The findings show that the inclusion of convergence technologies that integrate voice, text and images assists in the capture of stories in order to retrieve knowledge. The industry experts also confirmed that early knowledge management initiatives focussed heavily on technology but did not deliver what was required. While technology enables new and efficient ways of managing information, people cannot be forced to share information, although it is possible to encourage sharing behaviours by providing the opportunities and conditions for this to occur (Jansen 2008).

The second dimension of effectiveness is **business process**. The themes identified within business process indicate a lack of understanding of knowledge management as a business process for councils in SA:

- The KM Toolkit is known but not utilised by councils in South Australia.
- Knowledge management is not well defined or resourced by councils or local government in South Australia.
- Decision-making would be more informed and timely if there was access to knowledge.

A business process can be defined as beginning with a customer's need and ending with fulfilment of that need (Rodriguez 2007). It is a set of coordinated tasks and activities, conducted by both people and equipment that leads to accomplishing a specific organisational goal. Business processes are designed to add value for the customer and should not include unnecessary activities. The information contained in the process does not constitute knowledge management but can be combined with other information to deliver knowledge for the customer.

The third dimension of effectiveness is **culture** and people. The interviews showed:

- Knowledge management processes need to be easy to use, without having to think about it.
- Councils compete for the same ICT and knowledge management resources.
- ICT systems facilitate the transfer and sharing of knowledge.
- ROI is not easily identified or calculated for councils.

To bring people into the business process, there is a need to adopt a best practice approach to managing knowledge, using appropriate continuous improvement tools or excellence frameworks. Examples in local government include the SAI Global Business Excellence Framework (ALGA 2009).

Councils have a vested interest in maintaining their individual legacy systems which are module based with specific functions being administered at the departmental level. The culture is not open to sharing of knowledge despite recognition that the management of knowledge is fundamental for local government to analyse and improve service standards by sharing information and maximising collaborative advantage for the ratepayer (Mackay and Howes 2005; Lee, Chae and Suh 2004). All local government experts felt that the management of knowledge was important and that the culture of the organisation was the critical factor in the success of any knowledge management initiative. The industry and local government experts agreed that for the culture to embrace knowledge sharing in local government, knowledge management initiatives need to be resourced adequately with people, funding and time. Due to the inexperience of councils with knowledge management, each council will need to identify what knowledge means to them, based on their vision and strategy, and develop a separate knowledge management initiative for their council.

The fourth dimension of effectiveness is **methodology** or an applied set or system of methods, processes and rules. It is a documented set of procedures and guidelines for one or more phases of the life cycle of a particular discipline. Many methodologies include a diagramming notation for documenting the results of the procedure; a step-by-step approach

for carrying out the procedure; and an objective (ideally quantified) set of criteria for determining whether the results of the procedure are of acceptable quality. Methodologies inform processes and follow a stepped approach to business continuity.

Informed decision-making was seen by all the interviewees as the most beneficial impact in the use of knowledge management. There is a view that at present, council decision-making is ad hoc and high risk (R7, R8). Knowledge is not able to be retrieved as story-telling, is not captured, and knowledge management is not aligned to the councils' strategies and vision (R6). Knowledge sharing is unstructured and not seen as an outcome for traditional methodologies (R1). Although the KM Toolkit was developed for the ALGA in 2004, it has not been implemented in councils or given consideration as defining knowledge requirements in councils, as noted above. Some councils have adopted the Australian Business Excellence Framework (ALGA 2009) because assessment against this framework includes information and knowledge as a dimension and may be a future priority for these councils. These methodologies incorporate a stepped approach with a start and finish.

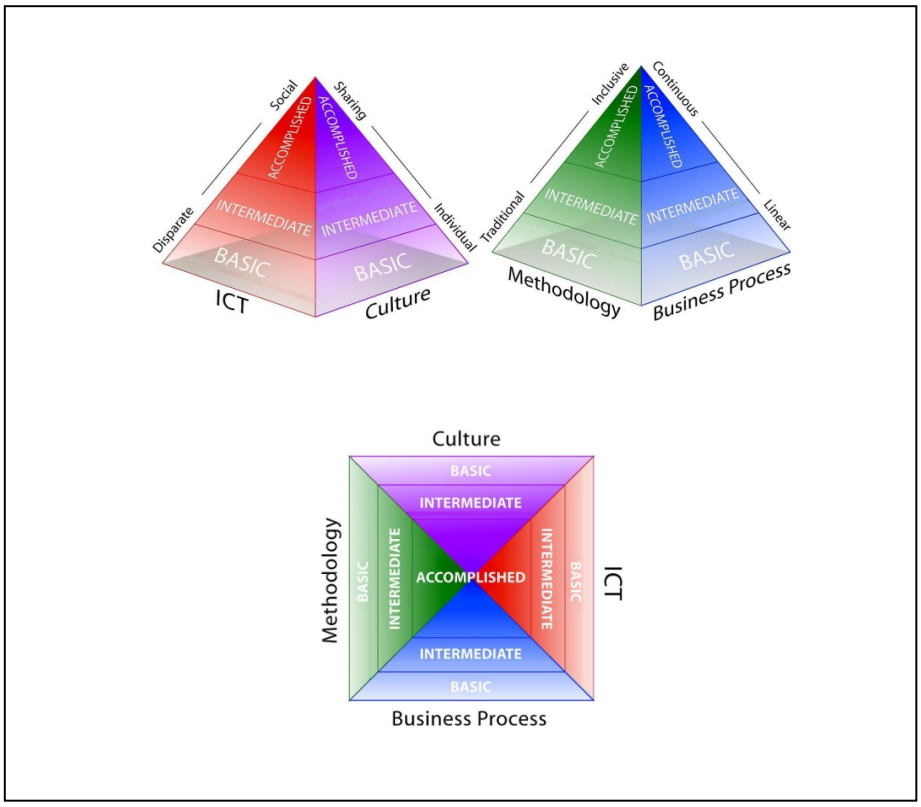
In brief**,** the four-dimensional framework above shows that ICT, business process, culture and methodology have an equal share in the effectiveness of knowledge management in local councils. ICT and business processes can assist knowledge management by enabling information and trends analysis leading to improved outcomes and informed decision-making. Thirdly, the human factor is not currently incorporated in the council's methodologies. Story-telling and tacit knowledge are often informal and not captured or re-used as knowledge. Finally, knowledge management is not incorporated in the council's methodologies or aligned to the vision. Continuous improvement for business process, best practice for ICT, and people management are not incorporated with the council's methodology and are seen as separate initiatives.

Step 3: measuring effectiveness in a pyramid. The next step was to compare a council's current situation within the dimensions to an ideal situation, to identify *gaps* for remedial

action. These gaps or opportunities for improvement inform the development of a pyramid model for the effective management of knowledge in local government. The key gaps included in the first dimension of ICT were disparate systems and limited use of convergent technologies and social computing. Similarly, for the second dimension of business process, the gaps included the lack of an agreed knowledge management definition across local government or within individual councils and that traditional ICT best practice processes do not include knowledge sharing as a requirement. With culture as the next dimension, the gaps were identified as individual business units working in isolation and knowledge sharing not being encouraged or embraced within departmental processes. The gaps for the last dimension of methodology included capturing knowledge for project management and the traditional organisation structure not being flexible enough to incorporate knowledge sharing or the human factor.

Because each dimension was deemed to be of equal importance, a four-sided pyramid with a dimension on each side was developed to reflect how effective local government is in managing knowledge, as shown in Figure 1.

Figure 1 **Knowledge management effectiveness pyramid model for councils and local governments**



Source: based on interview data and related literature.

Three levels of ‘basic’, ‘intermediate’ and ‘accomplished’ within each dimension were used as a measure of the assessment of the different of levels of effectiveness, as outlined in Table 3.

Table 3 **Definitions of levels for the dimensions**

Dimension	**Basic**	**Intermediate**	**Accomplished**
ICT	Disparate systems for individual or departmental use only	ICT systems include some sharing of information across departments	Social computing facilitates ease of capture and retrieval of knowledge shared across the organisation
Business process	Linear process, knowledge management requirements are not defined or included in business processes	Business processes are identified with assessment and improvement as needed	Knowledge management is included in business processes and continually assessed and reviewed including feedback for improvement
Culture	Information for the individual is trusted for the storage of explicit knowledge for individuals and departments only	Unstructured environment for the sharing of knowledge with no formal direction	Knowledge sharing valued and encouraged and included in strategic planning
Methodology	Knowledge management is not included in the traditional structured approach with start and finish	Some attempt to incorporate ROI for knowledge management in identified initiatives	Knowledge is aligned to the vision with identified ROI and ongoing dedicated resources

Source: based on interview data.

Using the definitions in Table 3, a council can determine where further effort is required to be a knowledge sharing organisation. Appendix A has more details about the levels that can be used by local government staff to identify gaps. In brief, the ranges differ for each dimension. ICT goes from disparate systems in the basic level to social computing at the accomplished level. Similarly, the business process dimension ranges from linear processes to continuous cyclic processes. The basic level for culture involves only for the individual whereas at the other end of the range sharing involves everyone in the organisation when knowledge management is accomplished. Finally, the range for the methodology dimension is from traditional approaches with limited knowledge sharing to the ideal inclusive situation incorporating methodologies that include sharing of knowledge as an integral requirement. To be effective in knowledge management, a council will need to be equally accomplished in all dimensions of the pyramid of Figure 1.

Further research is required to determine whether these results are reflective of all councils or whether this is only indicative of the councils surveyed for this research. Nevertheless, the findings demonstrate that, although individual councils may rate well in some areas, effective knowledge management is generally not accomplished in local governments. Rating the gaps across all dimensions will give perspectives on the depth of knowledge management in the organisation. A fully accomplished council would have continuous improvement processes, a sharing culture and inclusive methodologies that use technologies such as social computing to enable effective outcomes and decision-making.

Next steps

Further research is now being undertaken with validation of the performance matrix and the development of metrics that will enable councils to score their knowledge management effectiveness, and determine priorities for improvement in line with the four dimensions of effective knowledge management. The improvements are intended to help deliver the promises of knowledge management to reduce risk and the reliance on assumptions, and to increase timely and effective decision-making within councils.

Conclusion

ICT on its own is robust and available for the management of knowledge but cannot sustain knowledge management without the inclusion of culture, business process and methodology in the analysis. All categories can be rated as being basic, intermediate or accomplished by the council. By adopting the knowledge management effectiveness model in Figure 1 and related definitions, a council will be able to determine what is required to bring all categories to the accomplished level. This process will allow councils to determine areas to improve for knowledge management, with the inclusion of ICT as a trusted source for the retrieval of knowledge. Frequent assessment against the model will help ensure continuous improvement and confirmation. In conclusion, ICT has evolved as just one of the four dimensions of effective management of knowledge for local government. Using the knowledge management effectiveness model will provide detailed recommendations for

improvement of the management of knowledge in local governments, across the four relevant dimensions.

References

Australian Local Government Association, [Online], Available from http://www.alga.asn.au/index.php?id=20c07ecbbbe7d868fcab13e1318f7ceb Viewed July to September 2009

Australian Local Government Association, 2004, *Local Government Knowledge Management Toolkit,* 1.0

De Long, DW and Fahey, L, 2000, 'Diagnosing Cultural Barriers to Knowledge Management', *The Academy of Management Executive*, 14, 113-127.

Donoghue M, 2009, *Playing Tag*, [Online] Available from http://www.gantthead.com/profile/mike/ viewed August 2009

Edwards P and Bryant, L 2009, 'Overcoming challenges', *InsideKnowledge*, Vol 12, Iss 9.

Gaskell, G 2000, 'Individual and group interviewing', in *Qualitative Researching With Text, Image and Sound A Practical Handbook*, eds MW Bauer & G Gaskell, Sage, London, p. 39-56.

Grover, V, and Davenport, T H, 2000, 'General Perspectives on Knowledge Management: Fostering a Research Agenda', *Journal of Management Information Systems*, 18, 5-21.

Hoving, R 2007, *Information Technology Leadership Challenges – Past, Present and Future*, Information Systems Management, Vol 24 Issue 2 p 147.

Jansen, S 2008, *Managing Assets: Knowledge management – It's all about people*, NZ Marketing Magazine, Vol 27, Iss 10, p 48-49.

Lee, H, Chae, Y & Suh, Y, 2004, *Knowledge Conversion and Practical Use with Information Technology in Korean Companies,* Department of Global Management, Kyunghee Cyber-University, Seoul, Korea, School of Management, Kyunghee University, Seoul, Korea, Vol. 15, No. 3, pp279–294.

Local Government Association of South Australia, 2009, [Online]. Available from http://www.localgovt.sa.gov.au, viewed March to August 2009

Mackay, G and Howes, T 2005, *Channeling work streams in the organisation*, Knowledge Management Review, Vol 7, Iss 6, p 20-22.

National Archives of Australia, 2002, *Archives Advice 56*, Information management, knowledge management and recordkeeping.

Nguyen, T, Smyth, R, & Gable, G 2004, *Knowledge Management Issues and Practices: A Case Study of a Professional Services Firm*, Fifteenth Australasian Conference on Information Systems, Hobart, Tasmania.

Nickols, F 2000, *The knowledge in knowledge management,* The knowledge management yearbook 2000-2001 (pp. 12-21), Boston, MA: Butterworth-Heinemann.

Nonaka, I 1994, A dynamic theory of organizational knowledge creation. *Organization Science*, 5 (1), 14-37.

Rao, S & Perry, C 2003, 'Convergent interviewing to build a theory in under-researched areas: principles and an example investigation of Internet usage in inter-firm relationships', *Qualitative Market Research: An International Journal*, 6, 4, pp.236-247.

Rodriguez, R 2007 *Aligning ICT to Business Processes: How BPM is Complementing ERP and Custom Applications,* Aberdeen Group

State Records, 2003, *General Disposal Schedule No. 20*

Stokes, R and Perry, C 2007, 'Chapter 10. Case research about enterprises', in Hine D and Carson D, (eds), *Innovative Methodologies in Enterprise Research,* Edward Elgar, Northampton, Massachusetts

Sunassee, NN and Sewry, DA (2002) 'A Theoretical Framework for Knowledge Management Implementation', in *Proceedings of the South African Institute of Computer Scientists and Information Technologist*, Port Elizabeth, South Africa.

Twentyman, J 2006, 'Capturing knowledge', *Inside Knowledge,* Vol 9, Issue 6.

Yin,RK. 2003, *Case Study Research Design and Methods*, Volume 5, (3rd ed.) Sage Publications Ltd. London, England.

Appendix 1 **Identification of knowledge management levels for local government, based on the interviews**

Dimension	Identified gap	Evidence	Range	Level
ICT	No identified consolidated approach incorporating ICT for knowledge management	Disparate systems with no connectivity between councils	Disparate	Basic
	ICT systems designed for individuals or departments	Data is not shared between departments or other councils	Disparate	Basic
	Limited use of convergent technologies and social computing	No shared technologies between councils. Systems viewed as text based information for individuals and business units only	Disparate	Basic
	Requirements for ICT not included in knowledge management initiatives	No formal knowledge management initiatives in strategic or ICT planning	Disparate	Basic
Business process	Definition of knowledge management for councils in SA	No over-arching definition and strategic planning for councils. Does not include knowledge management initiatives or strategies	Linear	Basic
	Knowledge management not incorporated into business process methodologies for feedback and improvement	Local government is not using industry standard business process methodologies. Some councils have adopted independent industry acknowledged business process improvement tools	Linear	Basic
	Traditional ICT best practice frameworks do not include knowledge management	Best practice frameworks for ICT. Some councils have adopted independent frameworks	Linear	Basic
	ICT is not included and not all councils use an acknowledged framework	Business process frameworks do not include ICT as a measure for improvement	Linear	Basic
	Knowledge management is not mapped to financial benefits	ROI is decided and managed by councils. There is no prescribed calculation	Linear	Basic

Culture	ICT is not identified as the enabler for knowledge sharing	There is no connectivity between systems or business processes for councils or local government. Information in systems is not trusted.	Individual	Basic
	Knowledge management needs are not identified with tangible outcomes for projects	Knowledge management is not defined or resourced as a project or initiative in local government in SA	Individual	Basic
	ICT is set up for individuals or departments and tacit knowledge is not captured	Story-telling and conversations are not captured for retrieval as knowledge	Individual	Basic
Methodology	Knowledge management is not incorporated with ICT, business process or culture	Local government is not using industry standard methodologies although some councils have adopted methodologies and frameworks	Traditional	Basic
	The use of ICT convergent technologies, such as wikis, blogs, voice and image capture	There are no plans at a local government level to incorporate convergent technologies. Councils are developing individual requirements at different times	Traditional	Basic
	Traditional structured approach does not include the human factor	Council data is structured and text based. Story-telling is not captured in a format that can be retrieved as knowledge	Traditional	Basic
	Projects do not incorporate the knowledge benefits and ROI	Knowledge management is not included in annual business planning or decision-making	Traditional	Basic