

# ORGANIZING AND MANAGING KNOWLEDGE FOR e-GOVERNMENT

## *Issues, Practices and Challenges*

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**Keywords:** e-Government, Knowledge Management, Public Administration.

**Abstract:** Electronic Government requires new approaches to the acquisition, management and distribution of knowledge in the public organizations to transform public service delivery, enable inter-agency cooperation and support for complex decision making activities by both middle level and senior level public officers. This paper explains the need for knowledge management (KM) in government, explores knowledge management requirements for public organizations in the context of electronic government, and describes available KM solutions. In addition, the paper presents and analyzes examples of national and international KM initiatives and characterizes the maturity of current KM practices by governments. The paper concludes by indicating challenges to public sector KM practice and identifying essential elements of a robust KM framework for e-government.

## 1 INTRODUCTION

The capability to gather and generate valuable knowledge from information is a defining feature of a modern state (Friis 2002). It is increasingly understood that KM must be conceived as an integral element of any e-government initiative that seeks to enable innovation in government, better support policy and decision making, and transform public service delivery through inter-organizational collaboration among government agencies. Despite the growing awareness by government, there is yet to emerge robust KM frameworks to guide public organizations in their KM practices.

The goal of this paper is highlight some core knowledge management issues for e-government, examine current KM practices by government and international organization and discuss possible elements of a KM framework for e-government to address shortfalls identified in the current practices.

The rest of the paper is organized as follows: Section 2 presents a conceptual framework to underpin the discussion while the methodology for the study is presented in Section 3. KM solutions for the public sector are described in Section 4 while national and international KM initiatives are presented in Section 5. Discussions and concluding remarks are provided in Section 6 and 7 respectively.

## 2 CONCEPRUAL FRAMEWORK

### 2.1 KM concepts

There are many definitions of knowledge in the literature: as “a fluid mix of framed experience, values, contextual information, expert insight and grounded intuition that provides an environment of and framework for evaluating and incorporating new experience and information” (Davenport and Prusak, 1998); and as “information that changes something or somebody either by becoming grounds for actions or by making an individual (or an institution) capable of different or more effective action (Drucker, P.,1993).

KM could be defined as the effort to systematically find, organize and make available a company’s intellectual capital and to foster a culture of continuous learning and knowledge sharing so that organizational activities build on what is already known (Daft, 2001). According to (Snowden, D. 2000), KM is “the identification, optimization, and active management of intellectual assets, either in the form of explicit knowledge held in artifacts or as tacit knowledge possessed by individuals or communities”. “Knowledge conversion is about the interactions between explicit and tacit knowledge in continuous and spiral manner” (Nonaka, I. &

Takeuchi, H., 1991).

Major components of a typical KM practice discussed in the literature are:

- 1) *People* – consists of the employee of the organization whose motivation and ability to use existing organisational knowledge and share their own experience and lessons learnt determine the success of KM initiatives (Davenport, De Long, Beers, 1998).
- 2) *Process* – set of activities including organising and managing knowledge to create, capture, store, share and utilize (Nona, Takeuchi, 1991, Alavi and Leidner, 2001, Becerra-Fernandez, Gonzalez and Sabherwal's, 2004, O'dell, grayson and Essaides, 2003).
- 3) *Technology* - specifically IT infrastructure as primer enabler of successful implementation of KM projects (Gronlund A., 2002, Zhou Z, 2007, Yuen, 2007).
- 4) *Sources* – include documents, files, databases, reports within organisations and external information stocks for explicit knowledge, and employees for tacit knowledge.
- 5) *Knowledge Repository* – the storage for information and knowledge resources.
- 6) *KM System* – a platform equipping managers with specific tools to create, retrieve store, use and share knowledge. KM systems and repositories, as organizational memory systems (Alavi, M., and Leidner, 1999) make possible to accumulate, preserve and transfer rapidly and easily organisational knowledge.

## 2.2 KM and e-Government

The main objective of e-government is to enable efficient and effective delivery of public services in the most accessible and convenient manner for citizens and business. Different types of services for various categories of customers such as general citizenry, taxpayers, pensioners, youth and children, farmers, entrepreneurs, realtors and visitors, presents different user knowledge needs. In current e-government practices, huge amount of information is available online but the main causes of user dissatisfaction are out-of-date information, difficult to find right information and lack of needs orientation. Consequently, government must develop commensurate capacity to manage and process the huge volume of information collected through its regular interaction with citizens and other stakeholders. More importantly, it must be able to exploit the generated knowledge in service delivery innovation and other core functions or activities of government.

For internal government activities, e-government aims to enhance policy and decision making in different domains – healthcare, education, welfare, economics, finance, taxation, land management, defence, culture, foreign and internal affairs, agriculture, transport and communications which requires organisation and access to specific knowledge from different sources.

Complex organizational culture, environment for isolation in public sector, unwillingness for collaboration and sharing knowledge among public workers in e-government activities requires comprehensive solutions for organising and managing both explicit knowledge stored in the agencies and tacit knowledge from civil servants.

## 3 METHODOLOGY

The objectives of the paper are: (i) to explore KM requirements for the e-government practice, (ii) to review cases of national and international KM initiatives, and (iii) to discuss the major issues involved in KM practices for e-government.

To achieve these objectives, the paper: identifies and describes e-government activities requiring KM support; surveys the state of the art KM solutions; and maps KM solutions to identified e-government activities (KM Feature matrix); and analyzing the presented cases using the feature matrix. Finally, the current level of KM practice or maturity is assessed.

The cases present two categories – national and international initiatives. For both categories, we highlight: (i) major objectives, (ii) solutions applied.

## 4 KM SOLUTIONS FOR e-GOVERNMENT

KM can generally support internal workings of government as well as its relationships with citizens and other categories of stakeholders – in the area of service delivery, participatory policy development, and organizational learning and growth. Specific KM requirements in these areas include:

- R1) Providing access to knowledge for effective policy formulation accumulated from existing internal sources.
- R2) Supporting decision making activities by maintaining information on decision patterns, for instance in cases related to authorization or certification services.
- R3) Enabling effective sharing of experience, ideas

- and know-how among public workers to enable organisational learning.
- R4) Collecting and harnessing citizens’ feedback and demands to create new knowledge on services both in contents and delivery.
  - R5) Ability to harness information provided by citizens on governmental and non-governmental platforms as part of public consultation for policy and decision making.
  - R6) Analyzing e-service transactions or audit information as basis for improving service delivery, for instance through user profiling and service personalisation.
  - R7) Analysing good practice, cases and lessons learnt from other departments within and outside government to avoid “reinventing wheel”.

- S7) *Virtual communities or Community of Practices* - offer interaction and knowledge exchange platform by capturing experience of multiple experts and generate new knowledge to meet the needs of the community.

## 5 KM INITIATIVES FOR e-GOVERNMENT – CASES

This section presents an overview of national and international KM initiatives - presented in Tables 2 and 3 respectively.

## 6 DISCUSSION

The reviewed cases indicate that current national KM initiative tend to focus on building KM capabilities within government and enabling organizational and employee learning. International initiatives largely provide repository of good practices and learning resources for use by government institutions.

Frequently used KM technologies include internet, intranet and portal technologies, knowledge repository, communities and contents management solutions. Technologies such as data mining, semantic technologies and customer relationship management systems are yet to be adopted in mainstream KM practice.

In addition to technological solutions highlighted in this paper, organizational and governance issues are critical to the success of KM initiative in government. In particular, the following are considered imperative for successful KM initiative: strong leadership and awareness in government agencies; alignment of KM strategy with the main policy objectives and e-government, and the existence of Chief Knowledge Officer role in government for implementation and coordination of KM initiatives.

Current practice and research in the domain fall short in the following aspects: lack of research on methodology and tools for KM strategy development and models for alignment with e-government strategy; poor research and lack of case studies on KM systems to support decision making and strategic planning for e-government; lack of guidelines and toolkits for implementation of KM practices for e-government; shortage of efficient mechanisms and incentives for knowledge sharing to ensure cultural and organizational changes.

Table 1: KM Feature matrix.

KM Reqs.	KM Solutions						
	S1	S2	S3	S4	S5	S6	S7
R1	✓	✓					
R2		✓			✓	✓	
R3	✓						✓
R4			✓				
R5	✓			✓		✓	✓
R6			✓				
R7		✓					✓

In addressing these requirements, KM solutions spanning various families of technologies have been developed. Mainstream KM solutions for e-government include the following:

- S1) *Web technology, Intranets and Internet portals* - provide on-line access to information and knowledge within organization and across organization boundaries.
- S2) *Knowledge Repositories and Knowledge Bases* - accumulate knowledge from internal and external sources for collaborative utilization.
- S3) *Citizen Relationship Management* - helps to better recognize citizen demands, create citizen profiles, and serve citizens accordingly.
- S4) *Data Mining* – versatile approach to knowledge discovery and delivery. It allows the mining of data on interactions between the government and citizens or business to improve decision making, service delivery etc.
- S5) *Content Management* systems - help to overcome problems of information accessibility by knowledge workers.
- S6) *Semantic technologies* help to solve the problems of application and data interoperability, improved search and discovery capability.

Table 2: Cases - National Initiatives.

Country	Objectives	Solutions
Australia	<p><i>Develop KM capability in government:</i></p> <ul style="list-style-type: none"> <li>○ KM applications implemented within the Australian Public Service (APS).</li> <li>○ Case Studies provide tools and techniques for KM practice in the government agencies and demonstrate the importance of knowledge to public organizations and how technology can be used to support agency performance.</li> <li>○ KM Better Practice Checklist helps agencies enhance use of knowledge to improve productivity and service delivery.</li> <li>○ The e-Government Resource Centre provides access to knowledge on e-government.</li> </ul>	<ul style="list-style-type: none"> <li>○ KM case studies stored in the electronic archive of the Australian Government Information Management Office (AGIMO) and published on the portal.</li> <li>○ KM Better Practice Checklist guides information and knowledge management within and between agencies and focuses on non-technical issues.</li> <li>○ The e-Government Resource Centre is the Victorian Government's repository of e-government initiatives, strategies, policies, website standards, best practices and international research.</li> </ul>
Singapore	<p><i>Build employee capacity and enable organizational learning</i></p> <ul style="list-style-type: none"> <li>○ KM in the public service is linked with the e-Government strategy and action plans.</li> <li>○ Government KM portal enabled employees to build capacity on each other's knowledge and create better documentation of procedure.</li> <li>○ Repository intended to minimize re-work, shorten the learning curve for employees and ensure consistency in advice provided to customers and raise productivity.</li> </ul>	<ul style="list-style-type: none"> <li>○ Documentation of processes and capturing of project lessons upon completion of projects.</li> <li>○ Developing, refining and updating materials on-line, supported by a KM process and content management strategy.</li> <li>○ Repository of past work and experience for enterprise knowledge sharing.</li> <li>○ Portal to transfer best practices, tools and resources with industry partners, players and customers.</li> </ul>
Korea	<p><i>Underpin government transformation:</i></p> <ul style="list-style-type: none"> <li>○ Integrated Government KM System enables inter-government knowledge sharing and discussion aiming at sharing diverse policy information through e-document management and government work, and coordinating support for efficient decision-making</li> <li>○ KM system enables various ideas and knowledge proposed in the process of policy-making to be recorded and managed.</li> <li>○ The demands of the people analyzed and examined from various perspectives, and used in policy development and service delivery.</li> </ul>	<ul style="list-style-type: none"> <li>○ Government KM system connects the KM system and On-nara BPS of each agency through the Government Knowledge Management Center.</li> <li>○ Operation manuals, ordinance information, research data, policy related information, statistics and training information can also be searched and utilized within the system.</li> <li>○ The system allows real-time accumulation of core business knowledge, sharing and utilization of operations-based administrative knowledge and major policies and services of other agencies throughout the government</li> </ul>
United Kingdom	<p><i>Enable knowledge sharing among departments:</i></p> <ul style="list-style-type: none"> <li>○ Knowledge Network (KN) allows officials in all government departments to share knowledge with each other and work online with colleagues across government.</li> <li>○ Knowledge resources for local government explains the benefits of KM for local government, key steps and considerations in developing KM strategy in public sector organization.</li> </ul>	<ul style="list-style-type: none"> <li>○ Knowledge Network (KN) provides a cross-government communications infrastructure for secure access to 40 dedicated KM applications, discussion forums, web-based community sites, integrated workflow applications and knowledge pools.</li> <li>○ Knowledge resources related to local government are available from the portal of Improvement and Development Agency for local government</li> </ul>
United States of America	<p><i>Develop KM capability for federal agencies:</i></p> <ul style="list-style-type: none"> <li>○ Aim is to transfer KM concepts, principles, standards, practices, processes, strategies, and technologies across the Federal Government.</li> <li>○ Federal defence-related agencies- Navy, Department of Defence, Army and Air Force and civilian organizations - General Services Administration, Environmental Protection Agency and National Aeronautics and Space Administration are most active in KM.</li> </ul>	<ul style="list-style-type: none"> <li>○ Government's Chief Knowledge Officer (CKO) appointed the General Services Administration (GSA) since 1999.</li> <li>○ Federal Knowledge Management Working Group under the Federal Chief Information Officers Council (CIO Council) is an interagency body.</li> <li>○ Portals, content and document management, and collaboration systems.</li> </ul>

Table 3: Cases – International Initiatives.

Organization	Objectives	Solutions
European Union	<p><i>Enabling knowledge exchange:</i></p> <ul style="list-style-type: none"> <li>○ Innovative KM Infrastructures within European Public Administration (KIWI) aims to enhance e-Governance through utilization of KM methodology in the public sector and fits with eEurope program.</li> <li>○ E-Governance Enhancement via Knowledge Management (EG2KM) project enables project participants to learn and exchange technological knowhow and experience from successful European initiatives through adaptation in the context of Malaysia to enhance e-governance.</li> </ul>	<ul style="list-style-type: none"> <li>○ Web-based and mobile-accessible platform for acquisition, integration, analysis and sharing of distributed information and knowledge in multimedia formats, overcoming the problems caused by the complex communication and workflow processes that exist within and between government departments.</li> <li>○ Within the EG2KM project KM software for public administrators and KM Best Practices Training Tool Kit were developed based on the working model of European best practices, inclusive of measures, management tools, training and education components.</li> </ul>
United Nations Department of Economic and Social Affairs (UNDESA)	<p><i>Provisioning knowledge repository for e- and m-government initiatives:</i></p> <ul style="list-style-type: none"> <li>○ United Nations Public Administration Network (UNPAN) was developed and managed by the Division for Public Administration and Development Management in partnership with relevant international and regional institutions.</li> <li>○ The United Nations E-Government Readiness Knowledge Base (UNKB) is a benchmarking tool for research and analysis on the state of e-Government.</li> <li>○ The UNKB allows users to easily access, view, sort and print information from the UN e-government readiness database.</li> <li>○ Global Knowledge Repository for Electronic/Mobile Government (EMGKR) aimed to promote knowledge management, sharing and collaboration to deliver better services to their citizens.</li> </ul>	<ul style="list-style-type: none"> <li>○ UNPAN is a compendium of e-Government practices available at the portal contains cases of innovative e-Government applications from all geographical regions of the world, with a special emphasis on those that are adaptable and replicable by other countries.</li> <li>○ e-Learning initiative Online Training Centre within UNPAN provides for government officials from all over the world access to various on-line courses and learning materials on e-government and knowledge management in public organizations.</li> <li>○ EMGKR contains e-government Surveys, Innovative Practices, ICT Applications, Documents, News, Events, Directories, Training and Tools, Thematic Websites, National Policies and Strategies, Implementation Plans, Legal and Regulatory Framework, ICT Infrastructure, Institutional and human resources building, Monitoring and Evaluation.</li> </ul>
United Nations University (UNU)	<p><i>Cultivating a global Community of Practice for e-governance</i></p> <ul style="list-style-type: none"> <li>○ UNeGov.net Community of Practice network for e-Governance aims to share experiences between experts and practitioners in e-governance from different countries and regions around the globe., develop human capacity, transfer skills and knowledge.</li> </ul>	<ul style="list-style-type: none"> <li>○ Portal developed based on semantic web technologies provides technical support for collaborative problem-solving by offering rich collection of web-based resources - publications, projects, software, projects, people, organizations, problem descriptions, solutions for problems.</li> </ul>
World Bank	<p><i>Provisioning knowledge repository on e-Government:</i></p> <ul style="list-style-type: none"> <li>○ KM initiatives aimed to expand knowledge sharing and help e-Government researchers and practitioners to build their capacities for acquiring and applying knowledge relevant to their core development goals and communicating online.</li> </ul>	<ul style="list-style-type: none"> <li>○ Knowledge repository on e-Government developed within the InfoDev contains knowledge resources related to e-Government from various international, government and non-government organizations including surveys, strategies, guidelines, toolkits and case studies</li> </ul>

## 7 CONCLUSIONS

This paper argues for the need of KM practices as part of e-governance initiatives. While there are growing KM solutions in government organizations, improvement of these practices can only be achieved through a KM framework for e-government which addresses beyond technological issues, organizational and governance challenges.

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