Ten Guiding Principles for Knowledge Management in E-government in Developing Countries
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Abstract

Knowledge management, popularly known by its acronym KM, as is known today, is only 5 to 15 years old and is a distinct contribution of the private sector where the concept of knowledge as a "competitive advantage of the firm" and "knowledge capital" hold the sway. It is only recently that knowledge management (KM) has started making entry to public sector. One of the reasons for this development has been the emergence of information and communication technologies (ICTs) in the last decade and the emergence of knowledge worker and the knowledge economy.

Solow remark, made 20 years ago, that "You can see the computer age everywhere but in the productivity statistics" (Solow 1987) still survives. However, 'There is now persuasive evidence that the information and computer technology (ICT) investment boom of the 1990's has led to significant changes in the absolute and relative productivity performance of firms, sectors and countries' (Hughes and Morton 2005, p-3). More specifically, e-government contributes to economic development. For example, the overall GDP growth attributable to e-government in the period 2005-2010 in the European Union has been estimated at 2% (Corsi et al. 2006, p-5).

For suggesting guiding principles, the importance of e-government is described and five popular myths in knowledge management for e-government exploded, issues in knowledge management for e-government identified, the knowledge pyramid, types of knowledge places where knowledge can be kept, and dimensions of knowledge management are described followed by a stocktaking of knowledge management (KM) toolbox (De Brün 2005). Then a knowledge management cycle consisting of six phases of: 1. undertake knowledge audit, 2. create knowledge, 3. capture knowledge, 4. store knowledge, 5. use knowledge, and 6. review knowledge is developed.

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Finally, ten guiding principles for introduction of knowledge management (KM) in e-government for increased productivity in developing economies are proposed. The paper is concluded by observing that for ushering in e-government, it is essential to prepare an e-business plan incorporating, among other sub-plans, a knowledge management (KM) sub-plan together with a change management (KM) sub-plan, for quicker, smooth and sustainable e-government for increased productivity in developing economies.

1. Introduction

Knowledge management, popularly known by its acronym KM, as is known today, is only 5 to 15 years old and is a distinct contribution of the private sector where the concepts of knowledge as a "competitive advantage of the firm" and "knowledge capital" hold the sway. Its pioneers include Peter Drucker, who coined the term *knowledge worker* in 1970s, Karl-Erik Syeiby, who came out with *knowledge management activity planning* (KMAP) in 1980s and Nonaka and Takeuchi who popularized the concept of *tacit knowledge* in 1990s.

It is only recently that knowledge management (KM) has started making entry to public sector. In United Kingdom, for example, e-Envoy whose office was set up in 1999 and replaced by eGovernment Unit in 2004, introduced the knowledge network in 2000 followed by knowledge enhanced government (KEG). A development agency like the World Bank also set up a knowledge management secretariat and has come out with a knowledge assessment methodology (KAM).One of the important reasons for this development has been the emergence of information and communication technologies (ICTs) in the last decade.

The use of the term *knowledge management*, however, is far from happy. As noted by von Krogh, Ichijo and Nonaka (2000, p-2), 'In fact, the term *management* implies control of processes that may be inherently uncontrollable or, at least, stifled by heavy-handed direction.' They, therefore prefer the term *knowledge enabling*- the overall set of organizational activities that positively affect knowledge creation (ibid.).

2. Rise of Knowledge Worker and Knowledge Economy

Knowledge worker has emerged as a *key* resource for accelerated economic development. India has taken the unique initiative among developing economies of setting up a national knowledge commission for leveraging knowledge for economic development (Misra 2006). However, as education reaches more and more people in developing, the problem of educated unemployed needs to be addressed (Misra 2005). Emergence of Finland as a leading knowledge economy, which was earlier facing economic crisis, is a success story of

leveraging knowledge for economic development.Information and communication technologies (ICTs) and e-government play an important part in leveraging knowledge for economic development.

An attempt is made in this paper, after a brief overview of the field, to suggest ten guiding principles for introduction of knowledge management (KM) in e-government for increased productivity in developing economies.

3. What is Knowledge Management (KM) for E-government?

At the macro level knowledge management (KM) may be defined as leveraging of knowledge for attaining objectives of productivity and competitiveness of a national economy. At the level of a government, knowledge management (KM) for government (KM4G) may be defined as leveraging knowledge for improving internal processes, for formulation of sound government policies and programmes and for efficient public service delivery for increased productivity. Finally, knowledge management (KM) for e-government (KM4Eg) may be defined as management of knowledge for and by e-government for increased productivity. KM4Eg is a management tool for government decision makers and its programme implementers.

Government has been the principal user of knowledge since times immemorial. Primary function of government is decision-making and e-government provides unique support to decision-making (Figure 1). Government also has largest repositories of information and databases and e-government helps in their efficient management. Government always had access to the best available technology of the day to manage its affairs and e-government provides some of the latest and best available technology. There has also been information explosion in recent years and e-government provides an important tool to cope up with it. Office documents lead in storage on paper (Table 1), which highlights the need for *paperless office*, and which is an important promise of e-government.

## 4. Information and Communication Technologies (ICTs), E-government and Productivity

Solow remark, made 20 years ago, that "You can see the computer age everywhere but in the productivity statistics" (Solow 1987) still survives. However, 'There is now persuasive evidence that the information and computer technology (ICT) investment boom of the 1990's has led to significant changes in the absolute and relative productivity performance of firms, sectors and countries' (Hughes and Morton 2005, p-3).

Corsi et al. (2006, p-4), in a study commissioned by the European Commission for the e-government unit, note that 'Given the large share of PS in European countries' GDP, efficiency in PAs is an objective per se and a major driver of international competitiveness and economic welfare.' (PS=public sector, PAs=public administrations). According to them, e-government enhances GDP growth through four channels: (i) growth of PS productivity, (ii) growth of PS total output, (iii) efficiency of public administration (contributes directly to the efficiency of the economy as a whole and to the productivity of

the private sector in particular), and (iv) as part of aggregate demand (ibid., p-4). They estimate the overall GDP growth attributable to e-government in the period 2005-2010 in the European Union at 2% (ibid, p-5).

5.Importance of Knowledge Management (KM) for E-Government (KM4Eg)

Print, film, magnetic, and optical storage media produced about 5 exabytes of new information in 2002 (SIMS 2003) (1 exabyte= 10^{18} bytes). 92% of the new information was stored on magnetic media, mostly in *hard disks*. Film represents 7% of the total, paper 0.01%, and optical media 0.002%. Almost 800 MB of recorded information is produced per person each year (ibid.). Governments, therefore, face *information explosion* and KM4Eg can help governments in coping with *information explosion* leading to better policy formulation, better programme implementation and need-based skill formation for increased productivity. KM4Eg is no longer a choice but an imperative if economies have to survive in the unfolding era of privatization, liberalization and globalization.
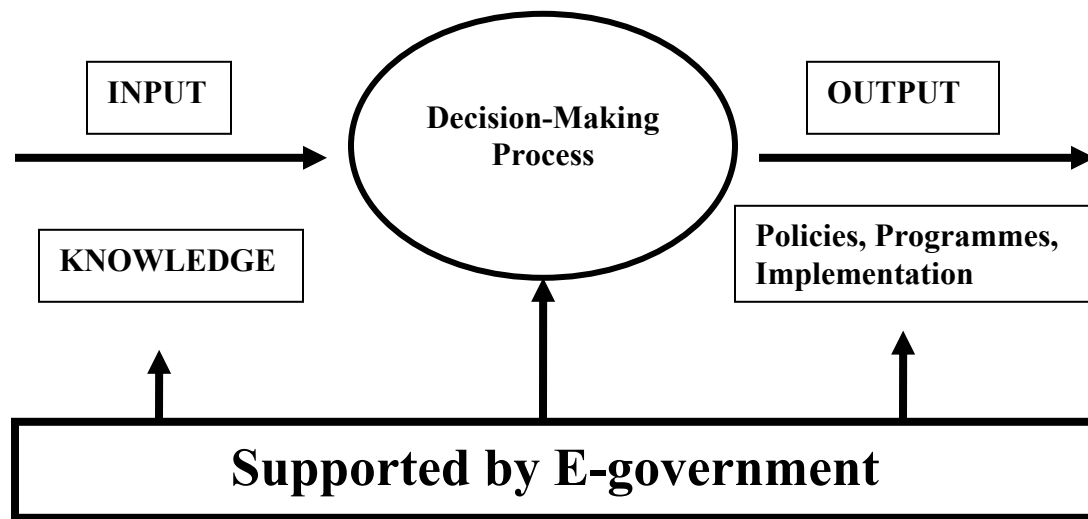
Figure 1 The decision-making process in government supported by e-government

KM4Eg may be viewed from a variety of perspectives, for example, process perspective, user perspective, technical perspective, organizational perspective, legal perspective, knowledge perspective, cultural, societal and political perspective (Wimmer 2002).

S.N.	Type of Content	Terabytes
1	Books	39
2	Newspapers	138.4
3	Office Documents	1,397.5
4	Mass market periodicals	52

5	Journals	6
6	Newsletters	0.9
7	Total	1,633.8

Source: How much information 2003 (SIMS 2003)

Table 1 Worldwide production of printed original content: Storage content: Paper

6. Exploding Five Myths in Knowledge Management for E-government

Myth 1: KM is a fad.
Wrong. It is here to stay whether we call it by this or any other name.
Myth 2: KM is not for government.
Wrong. Government being knowledge-based, it is very much for government.
Myth 3: KM is not for civil servants
Wrong. Being knowledge workers, civil servants are very much concerned with *KM*.
Myth 4: KM is not for e-government champions.
Wrong. KM being an integral part of e-government, e-government champions, whether politicians or civil servants, are vitally concerned with it.
Myth 5: KM is theoretical discipline.
Wrong. It is a practical *management tool*, which has tremendous potential for increased productivity and competitiveness.

7. Issues in Knowledge Management for E-government

A number of issues, some old and some new, have arisen in knowledge management for and by e-government in government, for example, (i) information is not up to date .(ii) required information is not available, (iii) too much information is collected, (iv) very little information is used in actual decision-making, (v) there has been information explosion and (vi) new areas like information and communication technology (ICT) and e-government have emerged calling for collection of new information.

8. Knowledge Pyramid for E-government

Knowledge pyramid is frequently used by knowledge management (KM) scholars (see, for example, Cong and Pandya (2004). Knowledge management (KM) for e-government has *four* components of (a) *data*, which consists of facts and figures, (b) *information*, which is *interpreted data* (data + interpretation), (c) *knowledge*, which is *use of information* (data + interpretation + use), and (d) *wisdom*, which is *application of knowledge* (data + interpretation + use + application) as shown in Figure 2. Note that wisdom, defined here as application of knowledge, and not knowledge *per se*, is the highest form of knowledge.

9. Types of Knowledge

Knowledge is of different types, for example, *old* and *new* knowledge. Similarly, there is *network* knowledge. Then there is familiar classification of *explicit* and *tacit* knowledge. There is yet another classification of *inexpressible*, *expressible* and *expressed* knowledge.

Among these, *tacit knowledge* is more important than explicit knowledge as experience indicates that actual decision making in government is based on *tacit* and *not* on *explicit knowledge*. For example, two civil servants can interpret a rule in two different ways. Then there is widely quoted observation of Polyani (1966, p-136) that *we can know more than we can tell* (emphasis original). Thus knowledge exists in great variety making the task of its capture, storage, retrieval and use in governments (and for that matter in any organization) a challenging task.

10. Sources of Knowledge in Government

There are a number of sources of knowledge in government, for example, (a) ministers, (b) legislators, (c) civil servants, (d) documents - files, agenda, records of proceedings, minutes, government orders (GOs), notifications, (e) laws, rules and regulations, (f) archives, (g) embedded in physical systems, and (h) citizens and non-citizens (say, tourists). These sources are not only widely dispersed but also exhibit a great variety in content.
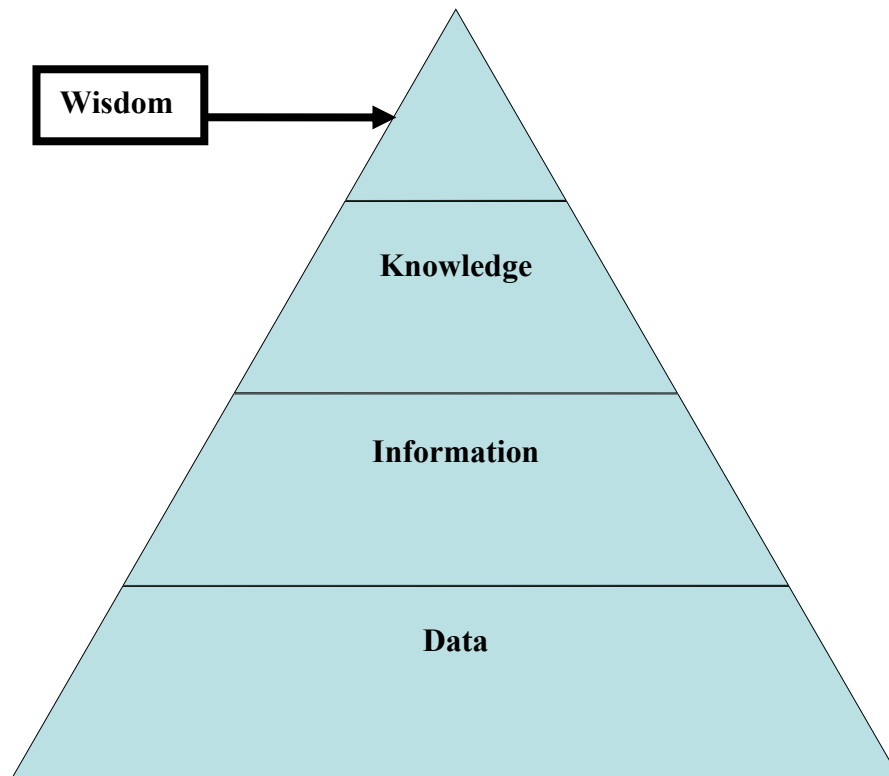
**Figure 2 Knowledge Pyramid in E-government**

11. Locating Knowledge

Knowledge can be kept in 4Ps: (i) *places* – recorded in existing document or database, (ii) *processes* – embedded in known work process, (iii) *people* – known to an identified

individual, and (iv) *pieces* – distributed in parts among several people or processes (as in value chain) (Curley and Kivowitz 2001, p-46)

12. Dimensions of Knowledge Management

There are *three* dimensions of knowledge management (KM): (i) people (P) - values and behaviours, (ii) process (P) - Internal structures, and (iii) technology (T) - enabler (KM≠T). It is a 3-legged stool. If one leg is broken, the stool falls down (Figure 3).

PPT Model in KM

Process
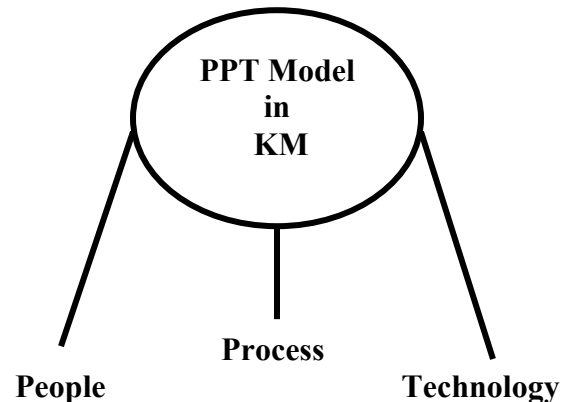
People   Technology

Figure 3 The People. Process and Technology Model in Knowledge   Management

13. Knowledge management (KM) toolbox for e-government

A number of knowledge management (KM) tools and techniques exist for e-government. For example,
1. *After Action Reviews* (AARs) (Pioneered by U.S. Army; for learning lessons from an activity or project),
2. *Communities of Practice* (COPs) (killer app of KM for sharing of knowledge),
3. *Knowledge Audit* (A systematic process to identify an organisation's knowledge needs, resources and flows, as a basis for understanding where and how knowledge can add value - de Brun 2005. Also comparison of performance against preset standards).
4. *Knowledge Plan* (Based on knowledge strategy)
5. *Exit Interviews* (Capturing knowledge of departing employees)
6. *Sharing Best Practices* (Identifying, capturing in one part of organisation and sharing with all others)
7. *Knowledge Centres* (Connecting people, information, databases)
8. *Knowledge Harvesting* (Capturing knowledge of "experts" and making it available to others).
9. *Peer Assists* (Learning from experience of others before undertaking an activity or project)
10. *Social Network Analysis* (Understanding relationships between people, groups and organisations as to how they facilitate or impede flow of knowledge)

11 *Storytelling* (Ancient art of sharing knowledge still widely used), and
12 *White Pages* (Preparing a directory of Experts) (Source: Adopted from De Brün 2005)

14. Knowledge Management and Technology

Knowledge management (KM) and technology today have become two sides of the same coin. Developments in these two fields are reinforcing each other. The four most popular types of knowledge management projects involved the implementation of intranets, data warehouses, decision support tools, and groupware (Ruggles 1998, reporting on a 1997 survey, as quoted by Hislop 2005, p-105). It has become inconceivable to think of one without the other. A number of functionalities in knowledge management (KM) are being helped by information and communication technologies (ICTs) (Table 6).

S.N.	Functionality	Information and Communication Technologies (ICTs)
1	Searching	Search Engines
2	Categorising	Computer Languages (XML, RDF)
3	Composing	Office Suite Applications
4	Summarising	Artificial Intelligence
5	Storing	Storage Media
6	Distributing	Networks
7	Workflow	Groupware
8	Content Management	Content Management Systems
9	Customer Relationship	Customer Relationship Management (CRM) Software
10	Metadata Standards and Interoperability	Semantic Web Technologies

Table 6 Knowledge Management and Technology
Source: Based on Riley 2003, Wagner et al. 2003 and Klishewski and Jeenicke 2004

15. Knowledge Management Cycle

KM can be viewed as a cycle consisting of six successive phases: 1.Undertake Knowledge Audit, 2 Create Knowledge, 3 Capture Knowledge, 4. Store Knowledge, 5. Use Knowledge, and 6 Review Knowledge.

Phase I Undertake Knowledge Audit
Ask questions like: Who collects what information? Why is it collected? Is it collected in time? Is collected knowledge put to any use? Is there a better way of collecting knowledge? Is required information being collected?

Phase II Create Knowledge
Take stock of existing knowledge. Assess knowledge needs of the organization. Determine who will create what information, when and in what format Use knowledge management (KM) tools for knowledge creation.

Phase III Capture Knowledge

Transform tacit knowledge into storable explicit knowledge (Neve 2003). Record one-to-one conversations. Record a brainstorming session Record minutes of the meetings and other proceedings Record success profile of individual e-government champions.

Phase IV Store Knowledge

Organize knowledge into codifiable and noncodifiable categories (Warren et al. 2006). Use electronic media for knowledge storage. Open a knowledge centre in the ministry/department. Identify and use "best practices" in knowledge storage.

Phase V Use Knowledge

Knowledge captured and stored should be made accessible to all concerned personnel. Distribute and share knowledge. Set up knowledge distribution and knowledge sharing mechanisms. Provide knowledge inputs to policy makers. Monitor knowledge use

Phase VI: Review Knowledge
Scan the horizon to anticipate knowledge needs of ministry/department Review the existing stock and flow of knowledge. Make use of simple but effective knowledge indicators. Involve stakeholders in knowledge review. Has knowledge led to better decision making and/or higher productivity? The knowledge management cycle may be seen in Figure 4.

16. Ten Guiding Principles for introduction of knowledge management (KM) in e-government

Guiding Principle1: Develop a knowledge management (KM) strategy for the organisation
Leverage knowledge for achieving organisational goals and serving citizens and non-citizens.

Guiding Principle 2: Proceed step-wise, from simple to the complicated.
Adopt modular approach. Do not attempt anything highly ambitious in the initial stages.

Guiding Principle 3: Do not re-invent wheel. Make use of existing knowledge and insights.
Undertake knowledge needs assessment. Only then plan the next step.

Guiding Principle 4: Make use of information and communication technologies (ICTs)
But do not forget GIGO, garbage in, and garbage out.

Guiding Principle 5: Make use of people, process and technology (PPT) model.
But do not forget: Computers: fast, accurate, *dumb*, People: slow, sloppy, *smart*

Guiding Principle 6: Prepare a simple and modular knowledge sub-plan incorporating knowledge management (KM) strategy.
Do not use any complicated knowledge management (KM) tool or mechanism that cannot be successfully implemented.

Guiding Principle 7: Include knowledge management (KM) sub-plan in the e-business plan of Ministry/Department.
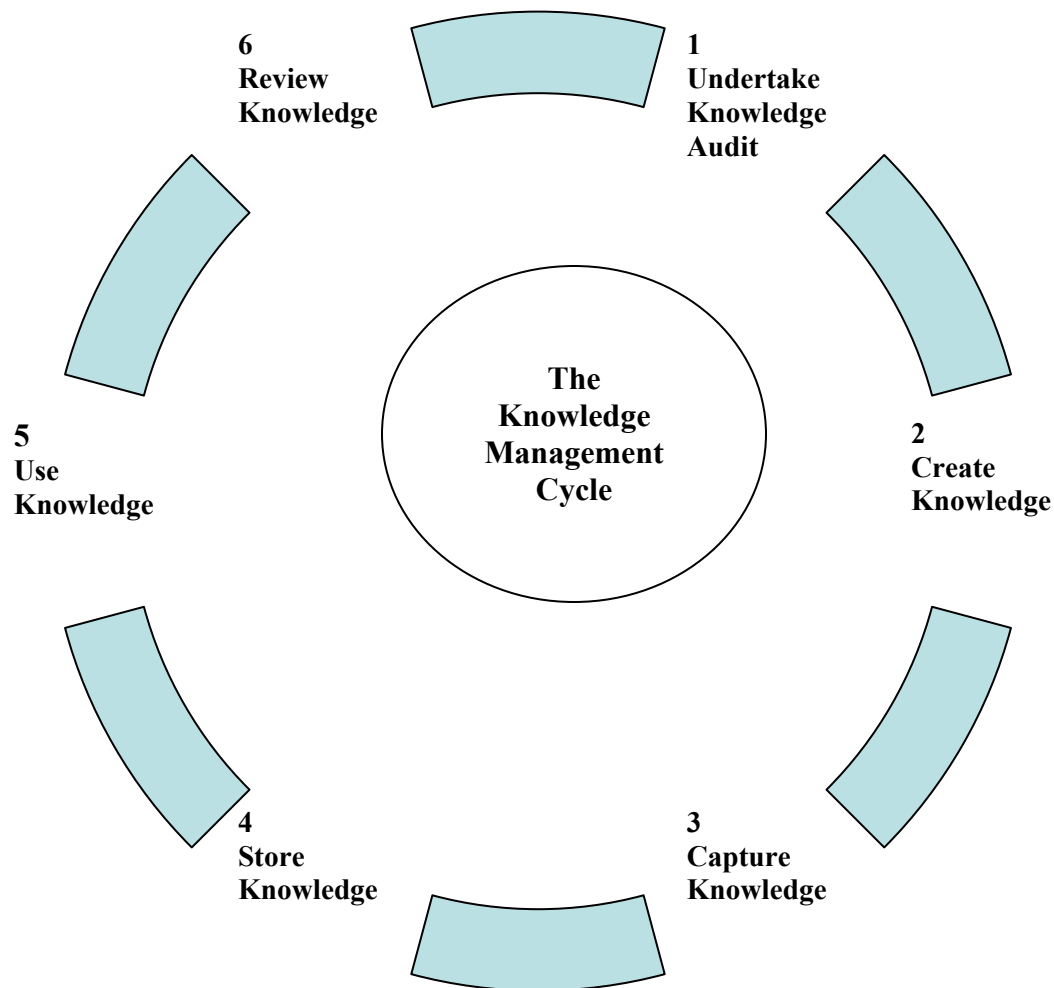Do not prepare any stand-alone knowledge management (KM) sub-plan. It is more likely to fail than succeed.

Guiding Principle 8: Secure top management support to knowledge management (KM) sub-plan.
Remember, no plan can succeed without top management buy-in. This is to be a priority.

Guiding Principle 9*: Demonstrate results.*
Remember, the best way to convince any one about practical utility of knowledge management (KM) is to show concrete, verifiable results.

6
Review
Knowledge

1
Undertake
Knowledge
Audit

5
Use
Knowledge

The
Knowledge
Management
Cycle

2
Create
Knowledge

4
Store
Knowledge

3
Capture
Knowledge

Figure 4 The Knowledge Management Cycle

Guiding Principle 10: Review the implementation of knowledge management (KM) sub-plan from time to time.
Review the implementation of the knowledge management (KM) sub-plan against the following *three* criteria: Has the implementation of the knowledge management (KM) sub-plan resulted in: (a) better decision-making by *government*, (b) better service delivery to *citizens and non-citizens*, and (c) better performance by *civil service*.

17. Conclusion

To conclude, the current e-government practice in developing economies is project-specific and not government-wide with the consequence that e-government impact often fizzles out at the level of a project and is not felt at the government level where decision-makers usually operate. A comprehensive government-wide approach to e-government is called for. For ushering in e-government in developing economies it is essential to prepare a comprehensive e-business plan, for improving internal government processes and providing improved public service delivery to citizens and non-citizens, incorporating among other sub-plans, a knowledge management (KM) sub-plan together with a change management (KM) sub-plan, for quicker, smooth and sustainable e-government for increased productivity in developing economies.

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