Understanding the Conceptual Framework of Knowledge Management in Government

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I. Introduction

With the unprecedented development of Information and Communication Technologies, human society has evolved into a Knowledge era, which means:

- Embodiment of knowledge in our daily lives and activities
- Active management of knowledge resources not limited to IT support
- Knowledge enriched environments becoming the focus of our interest in innovative developments.

One of these innovative developments is Introspection into the role of government in producing and using knowledge through better knowledge management.

Although everyone agrees with the utter importance of KM, it is the question of how to formulate the concrete path that guides government organizations to attain KM that is being hotly debated. The confusion and misunderstanding always centers on the understanding of key concepts, processes and dimensions of knowledge and knowledge management, which need to be cleared. Hence the theme of this presentation.
II. Topology of the Basic Concepts of Knowledge and Knowledge Management

Hierarchy of Knowledge Concepts

- Data
- Information
- Beliefs/insights/judgments/experiences/et c.
- Others

Knowledge (wisdom)

Knowledge Taxonomy

Knowledge Domain

Knowledge Ontology

Dimensions of Knowledge Management

- Policy/Strategy
- Processes
- People (individual, group, organization)
- Technology

Knowledge Management in Practice in General

- IT-track/people-track
- Innovative/sharing cycles
- Major Thematic Activities

Knowledge Management in Practice in Government

- Integration of Back-office with Front-office: (From E-government to K-government)
- Knowledge Management Capacity Building in Government
- Leveraging Internal & External Expertise
- Leveraging Knowledge Assets at Different Levels
- Developing Human Potential through Learning and Training
III. Key Concepts Concerning Knowledge

1. The Multi-layered, Multifaceted Concept of Knowledge

Throughout history, knowledge has always been viewed from multiple perspectives — abstract, philosophical, religious and practical etc., and the concept of knowledge invites various interpretations and definitions, many of which offer valuable perspectives and insights.

Beckman (1998) has compiled a number of definitions of knowledge in general and organizational knowledge in particular, some of which are quoted in the following:

- Knowledge is organized information applicable to program solving (Woolf, 1990).
- Knowledge is information that has been organized and analyzed to make it understandable and applicable to problem solving or decision making (Turban, 1992).
- Knowledge consists of truths and beliefs, perspectives and concepts, judgments and expectations, methodologies and ‘know-how’ (Wiig, 1993).
- Knowledge is the whole set of insights, experiences and procedures which are considered correct and true and which, therefore, guide the thoughts, behaviors and communication of people (Van der Spek and Spijkervet, 1997).
- Knowledge is reasoning about information to actively guide task execution, problem-solving and decision making in order to perform, learn and teach (Beckman, 1997).
- Organizational knowledge is processed information embedded in routines and processes which enable actions. It is also knowledge captured by organization’s systems, processes, products, rules and culture (Myers, 1996).
- Organizational knowledge is the collective sum of human-centered assets, intellectual property assets, infrastructure assets and market assets (Brooking, 1996).

It seems that the attempts to define knowledge as one single definition that covers all aspects and at the same time receive unanimous consensus is impossible, especially when the embodiment of knowledge changes at different individual, organizational and social levels.

It would seem appropriate to avoid imposing a strict definition but rather regarding knowledge as a “multi-layered, multifaceted concept” that “can impact different organizations in very different ways.

For this reason, we conclude in this paper (for the purpose of discussing on KM in government) that:

➤ knowledge is a fluent mix of structured experience, beliefs, relevant information and intuition of experts and;
➤ besides residing in human minds, knowledge can also exist in such forms as organization’s systems, processes, products and culture etc..
Hierarchy of Knowledge Concepts

Data

Information

Beliefs/insights/judgments/experiences/etc.

Other

Knowledge (wisdom)

Knowledge Taxonomy I

Knowledge Taxonomy II

Knowledge Domain

Knowledge Ontology
2. The Conceptual Hierarchy of Data, Information, Knowledge and Wisdom

As Davenport and Prusak have explained:

Data is: simple observation of states of the world
Information is: data endowed with relevance and purpose
Knowledge is: Valuable information from the human mind
3. Popular Schemes of Knowledge Taxonomy

Even with its multifaceted and fluid nature, knowledge can still be characterized in many ways. The most widely accepted schemes include the taxonomy of knowledge being regarded as propositional and perspective, and that of dividing knowledge into tacit and explicit. (Also third and fourth taxonomies like....)

*Propositional and Perspective Knowledge*

According to Joe Mokyr:

Propositional knowledge contains what people usually call “science” as a subset, but at the same time it contains a great deal more than science. Propositional knowledge also contains practical informal knowledge about nature; an intuitive grasp of basic mechanics; regularities of nature and even things as informal as folk wisdoms etc.

Perspective knowledge has the form of techniques or instructions. They reside either in people’s brains or in storage devices. They consist of designs and directions for how to adapt means to a well-defined end. They can all be taught, imitated, communicated, and improved upon.
Explicit and Tacit Knowledge

Perhaps the most widely accepted knowledge taxonomy among researchers and practitioners is Nonaka and Takeuchi’s differentiation between explicit knowledge from tacit knowledge. According to them:

Explicit knowledge is that which:
“can be expressed in words and numbers and can be easily communicated and shared in the form of hard data, scientific formulae, codified procedures or universal principles”

whereas tacit knowledge is:
“highly personal and hard to formalize. Subjective insights, intuitions and hunches fall into this category of knowledge.”

Hence, explicit knowledge in organizations is typically found in documents and databases, while tacit knowledge is that which is in the heads of people.

No matter how knowledge is categorized, it is an elusive and vulnerable commodity and can suffer a precarious existence. And primarily, knowledge is held subconsciously in a tacit state defying any attempt at elicitation.
4. The Domains and Ontologies of Knowledge

A domain is a recursive structure containing an ensemble of objects representing a configuration of knowledge assets. An organization’s intellectual capital is maintained within a web of knowledge domains as an integrated series of functionally cohesive models.

The lifecycle trajectory of a knowledge asset will involve several dimensions of knowledge creation, namely, epistemological, behavioral, organizing/control, as well as, ontological dimensions of knowledge cycle.

Knowledge elicitation depends crucially on the conventions adopted to express and arrange concepts that may have only a tenuous and fragmented presence. As a knowledge asset matures and becomes available for more rigorous and robust definition, the requirement emerges for more sophisticated means of articulation. Knowledge assets are represented as multi-faceted objects supporting a diversity of interrelated abstractions and perspectives specified by some modeling convention.

Of particular interest to this part of our paper is the proposition that a knowledge asset is likely to encounter multiple ontologies during its spiral trajectory.
Nonaka and Takeuchi (1995) discussed the epistemological and ontological dimensions of knowledge creation spiral by providing an elegant expression of the dynamics of organizational knowledge creation in a 2-dimensional space. Nonaka and Takeuchi claim that as a knowledge asset progresses through organizational strata and beyond to the external environment, it engages new domains and ontologies. Ontological transition is thus a multi-dimensional odyssey.
Boisot (1995, 1998), transforms the epistemological dimension of Nonaka and Takeuchi’s Spiral into a 2-dimensional space by applying the proposition that cognitive activity employs the two economizing techniques to extract information from data: coding and abstraction. Therefore, following Boisot’s approach, the dynamics of organizational knowledge creation must be expressed in a 3-dimensional space.

![Diagram of 3-dimensional space]

Boisot suggests that knowledge assets are created initially at the task level, where a task is an atomic activity. A task might be considered to be contained within a transaction, and executed within the context of a dynamic constellation of other tasks. A transaction might be considered similarly to be embedded within a process and so on. A hierarchy of activities emerges and provides a framework for structuring domains.
Yolles (1999) believes that knowledge systems exist by virtue of the worldviews that create them. In his terminology, worldviews are generators of knowledge. Yolles distinguished two types of worldview which he respectively calls weltanschauung and paradigm. The former is what we mean tacit knowledge, the latter the explicit knowledge.

Yolles’ diagram explains the relationship and interactions of the four kinds of knowledge domains: cognitive domain, behavioral domain, organizing/cybernetic domain, and the domain of ontology.
Dimensions of Knowledge Management

- Policy/Strategy
- Processes
- People (individual, group, organization)
- Technology
IV. Key Concepts and Dimensions of Knowledge Management

1. What is Knowledge Management?

As is the case with knowledge itself, there cannot be a simple and straightforward definition for KM. In order to avoid misunderstanding, and to be more scientific, we suggest either not giving any definition to KM or treating it in the same way as with knowledge itself.

But, at least the following range of key considerations in relation to knowledge management should be identified:

- It is fundamental that knowledge should be utilized and shared within the organization; and, if possible, should be stored in its most explicit forms.
- Knowledge management does not just stop on the purpose of sharing; knowledge management should also be regarded as the enabler of innovation and learning.
- The purpose of knowledge management is to make organizations more efficient and effective, and to be aligned with organizational strategy for the support of achieving organizational objectives.
2. Dimensions of Knowledge Management at Different Levels

Skyrme has developed a dimensional scheme for knowledge at different key levels

<table>
<thead>
<tr>
<th></th>
<th>Policy / Strategy</th>
<th>Processes / Methods</th>
<th>People / Skills</th>
<th>Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Governments (inc. EU)</td>
<td>Stimulation</td>
<td>Guidance</td>
<td>Qualification and Skills</td>
<td>Interoperability standards</td>
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<td></td>
<td>Good practice</td>
<td>Standards</td>
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<td></td>
<td>Regulation</td>
<td></td>
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<tr>
<td>Intra-organization</td>
<td>Collaborative associations</td>
<td>Collaboration methods and standards</td>
<td>Skills development</td>
<td>E-business networks</td>
</tr>
<tr>
<td>Organization</td>
<td>Knowledge-based business</td>
<td>Best practice KM processes</td>
<td>Personal development programmes, e-learning</td>
<td>Corporate portals</td>
</tr>
<tr>
<td>Teams</td>
<td>Tasks and outcomes</td>
<td>Virtual working</td>
<td>Team roles</td>
<td>Collaborative workspace</td>
</tr>
<tr>
<td>Individuals</td>
<td>Career / life planning</td>
<td>KM specialties</td>
<td>Professional development</td>
<td>ICT / Internet proficiency</td>
</tr>
</tbody>
</table>

As this table has illustrated knowledge management is a type of systematic and comprehensive endeavor. A real successful knowledge management project, especially for government organizations, from the perspective of promoting knowledge management for the whole society, should “unconsciously” and “voluntarily” encompass every possible dimensions and levels for the mindset of linking all different levels of players and/or stakeholders together in the pursuit of establishing the “knowledge society”.

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3. Policy and Strategies of Knowledge Management

Designing and implementing a successful knowledge management program is not as simple as one takes it for granted. Even though all the necessary “established management tools” for knowledge management are there, this is not to suggest that organizations should assume that knowledge management just naturally happens.

Two Thrusts of Strategies

Skyrme found two types of strategies regarding the current mainstream knowledge management practices.

- The first is to make better use of the knowledge that already exists within the organization.
- The second is innovation—the creation of new knowledge and turning ideas into valuable products and services.
Four Broad Types of Policy/Objectives

In a review of 39 knowledge management projects in the private sector, Davenport, et al. identified four broad types of objectives.

➢ The first type of objective was the creation of knowledge repositories. These projects generally took the form of database management programs.

➢ The second objective was to improve knowledge access. These projects focused on the access to and the sharing of knowledge such as the composition of expert networks.

➢ The third objective was to enhance the knowledge environment. Projects in this category sought to change norms and values to attempt to shift what is valued in the organization so as to encourage both the creation and sharing of knowledge.

➢ The final objective was the management of knowledge as an asset. These projects involved creating formal audits and metrics of knowledge management at the corporate level. Essentially, they attempt to codify intellectual capital and report them on the company’s balance sheet.
4. Collaborating with the Established Management Tools: A Holistic Perspective of Knowledge Management in General

Some believe that there is nothing particularly new in the concept of KM, in some sense it simply represents a re-packaging of things that good organizations should do as a matter of course. However the reality is that: compared with existing management tools, it is with the concept of KM that, for the first time, KNOWLEDGE has been identified the fundamental managing object. Yet no matter what happens, many of the existing management tools are proved and actually would remain to be highly useful.

*Change Management*

Initiating a knowledge management program within an organization is essentially to bring changes into the organization, hence many of the techniques from change management will also apply.

*Learning Organization*

One component of the goals for knowledge management is to establish a learning environment within the organization so that it can learn and constantly transform accordingly by itself. Naturally the concept of learning organization is perfectly applicable to knowledge management.
Human Resource Management
Knowledge management is to manage knowledge. But knowledge, especially tacit knowledge, resides in people’s minds, and “people walk”. Therefore a successful knowledge management program would require a successful human resource management.

Top Leadership Management
Without full support from top management team almost no new management initiatives would succeed. Knowledge itself has unique characteristics and Knowledge management as a relatively new managing concept particularly needs support form top management.

To summarize, all these existing tools of management constitute the most valuable resources within modern organizations for the successful pursuit of ultimate organizational goals, yet knowledge management differs from them in that it advocates a continuous commitment to knowledge acquisition and creation. For this reason, a successful knowledge management system should be the embodiment of all the above-mentioned concepts and maintain a holistic view of adopting them for the purpose of better managing knowledge.
5. Key Processes of Knowledge Management: Tacit-explicit Transformation Spiral

One of the focuses of knowledge management is the attempt for the transformation of knowledge from a tacit to an explicit state and vice versa. Of particular interest for the purposes of this endeavor are definitions seeking to establish the distinction between phenomena, data, information and knowledge.

Bellinger et al (2004) prefer a hierarchy comprising simply data, information, knowledge and wisdom, with different understanding levels through the understanding transition.
6. Four Types of Knowledge Creation Process

According to Nonaka and Takeuchi, much of the value of knowledge is created as it is transformed through four different modes of interaction between tacit and explicit knowledge:

(1) **Socialization.** This is the exchange of experiences whereby personal knowledge is being created in the form of mental models, which involves conversion from tacit knowledge to tacit knowledge (2) **Externalization.** This involves the conversion from tacit knowledge to explicit knowledge where personal or tacit knowledge is made explicit in the form of metaphors, analogies, hypotheses and models (3) **Combination.** This involves conversion from explicit knowledge to explicit knowledge. During this process notions are synthesized into a knowledge system. (4) **Internalization.** This involves the conversion from explicit knowledge to tacit knowledge.
Knowledge Management in Practice in General

- IT-track/people-track
- Innovative/sharing cycles
- Major Thematic Activities
V. Knowledge Management Practices in General

1. Two Tracks of Knowledge Management

One of KM’s leading practitioners Karl-Eric Sveiby describes the current practice of knowledge management as being divided into two tracks:

**IT-Track KM = Management of Information.** They are involved in construction of information management systems. To them Knowledge = Objects that can be identified and handled in information systems. This track is new and is growing very fast at the moment, assisted by new developments in IT.

**People-Track KM = Management of People.** They are primarily involved in assessing, changing and improving human individual skills and/or behavior. To them Knowledge = Processes, a complex set of dynamic skills, know-how etc, that is constantly changing. They are traditionally involved in learning and in managing these competencies. This track is very old, and is not growing so fast.

It should be noticed that both tracks are the integral parts of an organization’s grand knowledge management strategy. Rather than competing with each other, they are in the nature of supplementing each other.
2. Two Key Activity Processes of Knowledge Management

Within organizations, much of the emphasis of early knowledge management programs was on finding out existing knowledge so as to avoid the phenomenon of “reinventing the wheel”. As categorized by Skyrme, who called this process as knowledge sharing—“knowing what we know”. However, more important for the establishment of competitive edge and long-term development of an organization, the other process of knowledge management that underlies innovation is being put more emphasis among organizations. As shown in the following figure both cycles have their own components.
3. Major Thematic Activities of Knowledge Management in Practice

Several major thematic activities of knowledge management have already been amply testified by practical evidences. They include:

**Knowledge Codification**
The aim of codification is to put knowledge into a form that makes it accessible to those who need it. It converts knowledge into accessible and applicable formats and literally turns knowledge into a code (though not necessarily a computer code) to make it as organized, explicit, portable, and easy to understand as possible. The common practice of knowledge codification in organizations include the processes to categorize knowledge, describe it, map and model it, simulate it, and embed it in rules and recipes. Each of these approaches has its own specific set of values and limitations, and they can be applied singly or in combination.

**Transfer of Tacit to Explicit Knowledge—Mapping Knowledge Sources**
The essence of this approach is to connect people who have problems with those who have the solutions, which is usually called mapping knowledge sources. A knowledge map points to knowledge but doesn't contain it. The principal purpose and clearest benefit of a knowledge map is to show people in the organization where to go when they need expertise rather than spending time tracking down imperfect answers.
**Knowledge Repositories**
The typical goal of this phase of KM is to take knowledge already embodied in documents and put it into a repository where it can be easily stored and retrieved. As one of the “first-step-projects” of KM, the establishment of knowledge repositories can also help reinforce an organization's cultural rituals and routines. One instance of Knowledge Repositories is “Best Practices”.

**Knowledge Access and Transfer**
Knowledge access phase focus on the possessors and prospective users of knowledge to provide access to knowledge as well as to facilitate linkages and socialization among members. A "knowledge Yellow Pages" might best symbolize the purpose of knowledge access projects. An instance here is “Communities of Practice” (CoP).

**Knowledge-Sharing**
Knowledge abounds in organizations, but its existence does not guarantee its use. Knowledge-sharing processes vary in their technological orientation. Generally speaking, knowledge-sharing in government settings can be of two types: the formal or quasi-formal, structured channels, and the more informal channels of face-to-face communication.
Knowledge Management in Practice in Government

Integration of Back-office with Front-office: (From E-government to K-government)

Leveraging Knowledge Assets at Different Levels

Developing Human Potential through Learning and Training
VI. Knowledge Management Capacity Building in Government: Integration of Back-office with Front-office

It has long been criticized that there is a huge gap between the front- and back-offices within government operations, that is, government services were deemed as unsatisfactory because complains and suggestions made by the public through front-office channels were not necessarily reflected in the policies formulated by the back-office. Sometimes even government employees from the front-office would feel confused about the rules made through the back-office, which inevitably led them to make mistakes during normal government businesses when they were dealing with customers.

With the implementation of knowledge management this gap will gradually diminish as the inter-link between front- and back-office will be greatly improved; also the quality of government services (front-office) will be improved by the integration of knowledge management systems as the result of the initiation of KM projects (back-office).
Current E-government projects and applications among all different levels of governments have laid a very solid foundation for the implementation of knowledge management.

As e-government has become the standard for government operations, also with the help of state-of-art ICTs, front-office in government are able to collect and store much more detailed and specifically customer-related information.

This kind of information is very important to government organizations, and will become a large part of its KM initiatives for the analysis and attempt of transformation into knowledge for the purpose of better decision-making and policy formulation.

In order to realize this purpose, the back-office would have to rely on close collaboration of the front-office and seek their “first-line” experiences. Also for successful KM programs it will eventually establish formal and systematic mechanisms such as Community of Practice (CoP) to encourage interpersonal connection and knowledge sharing. All these will increase the inter-link between front- and back-Offices within government organizations and consequently establish a better knowledge system. At the same time, the establishment of a better knowledge system would in turn naturally improve the quality of government services.
The gap between the front- and back-office will eventually diminish with the progress of fully implementation of KM in government organizations although the main functions of these two parts would still remain different and their distinctions are becoming blurred.

To realize this aim, we think any KM initiatives in government organizations must pinpoint their efforts on the following three “explorations”, which constitute the major challenges as well as opportunities for KNOWLEDGE MANAGEMENT IN GOVERNMENT.

1. Leveraging both internal and external expertise;

2. Leveraging knowledge assets at different levels; and

3. Developing human potential through learning and training.
Thank You All for Your Attention!