

Knowledge management For e-gov projects in African countries

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ABSTRACT

In a context of modernization of public administration, through the use of ICT in general and e-government in particular, it raises the question of what are the appropriate tools to facilitate the creation and transfer of knowledge for the benefit of public service users. Disciplines are born and complete each other to that effect. This article for its part, aims to present the Knowledge Management (KM) as a tool for facilitating implementation of e-government projects in African States on the one hand, and to explore the possibility for an e-gov infrastructure to support the KM processes on the other hand. Our contribution is to propose a model of acquisition of external knowledge in one side, and for the share of best practices in the knowledge transfer process between public employees through the use of e-government infrastructure in the other. To develop these two models, we relied on the analysis of strengths, weaknesses, opportunities and threats of this type of project.

Key words: Knowledge, KM, e-gov, acquisition model, transfer model.

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I-CONTEXT AND PROBLEMATIC

1. Context

1.1 The new face of public administration

The advent of Information and Communication Technologies (ICT), and more specifically the advent of Internet, has revolutionized the methods of access to information at the end of the 20th century. With Internet, it is now easier to learn, train, communicate, exchange or share digital data. There is talk about democratic access to information.

This opportunity of access to information leads to the questioning of previous methods. We are witnessing a new redistribution of roles, a new form of power. In short, in few years, we have passed from remote and inaccessible information to closer, spontaneous and easily accessible information.

In this context of global upheaval, states will face new demands from users in the provision of public services, including calling for the permanence of this service, availability, accessibility anywhere, anytime [1]. Indeed, public service users wish to find the facilities

offered by Internet in their daily lives with respect to the state. They await the democratization of public service by simplifying procedures, process automation and digital culture on the part of state officials.

To meet the users' requirement, a new concept of electronic government (e-Government) will be born, most simply noted "e-gov".

According to the World Bank, "E-government can be defined as the use of ICT for the promotion of a more efficient and effective government; facilitating access to government services, allowing better public access to information and making government more responsible to its citizens " [2].

Today, governments worldwide are working on the implementation of e-government infrastructure. These efforts are not solely on the issue of digitization itself, but also the reorganization of public services and participation processes based on new ICT which can be considered as Internet-based technology applications, but also including network technologies, databases, and electronic workflow systems [3]. With these technologies, it is now possible to achieve independency in time and space. Applications, forms and processes are available permanently. Therefore, public access to these services and participation can be reviewed and improved.

Table 1. Reinventing Local Governments and the eGovernment Initiative [4].

<i>Paradigm shifts in public service delivery</i>		
	<i>Bureaucratic paradigm</i>	<i>E-gov paradigm</i>
Orientation	Production cost efficiency	User satisfaction and control flexibility
Processus organization	Functional rationality, departmentalization, vertical control of hierarchy	Horizontal hierarchy, network organization, information sharing
Management processus	Management by rule and mandate	Flexible management, interdepartmental team work with central coordination
Leadership style	Command and control	Facilitation and coordination, innovative entrepreneurship
Internal communication	Top down hierarchical	Multidirectional network, with central coordination, direct communication
External communication	Centralized, formal limited chanel	Formal and informal, direct and fast feedback, multiple channel
Mode of service delivery	Documentary mode and interpersonal interaction	Electronic exchange, no face to face interaction
Principle of service delivery	Standardization, impartiality, equity	User customization, personalization

For Tapscott and Caston [5], ICT cause a "paradigm shift" by introducing "the age of intelligent networks" and reinventing businesses, governments and individuals habits. Indeed, "the traditional bureaucratic paradigm, which is limited to the internal productive efficiency, to rationality, to the departmentalization, to hierarchical control and management oriented rules" [6], is replaced by competitiveness and knowledge-based economic needs such as flexibility, network organization, horizontal/vertical

integration, innovative entrepreneurship, accelerate service delivery, and implementation strategies to address the users needs (cf. table 1). "These new paradigms motivate the transition to the paradigm of e-gov, which focuses on creating coordinated networks, external collaboration and customer service" [4].

Moreover, the e-gov changes the interactions between government on one hand, companies and citizens on the other hand, with the objective of:

- Speed: because the user no longer has to physically move to an administrative one-stop, he/she can perform the entire transaction online. In addition, new procedures for collecting and exchanging data limit the contacts of citizens and businesses with government;
- Access: the ability to access electronic kiosks in public administration 7 days a week, 24 hours a day irrespective of where one is;
- Transparency: as the e-government facilitates interactions between government, citizens, and businesses. It tends to involve them more fully in the decision making processes of public authorities.
- And a large gain: the e-gov can significantly reduce the costs incurred by the taxpayer to benefit and improve the quality of service [7].

Finally, the goal of e-gov is to develop technology solutions to support the interaction of citizens and businesses with public institutions to improve their participation in public and social life [8].

The e-gov is therefore not limited to simple on-line information on government websites. It involves a major overhaul of the structure and functioning of government. Indeed, administrative procedures such as collection, processing and electronic exchange of data within or between administrations, must be adapted to the provision of electronic public services that meet the needs of citizens and businesses, allowing them broad participation in national life [9]. These interactions are in 4 types: G2G (Government to Government), G2B (Government to Business), G2C (Government to Citizen) and G2X (Government to others) (cf. figure 1)

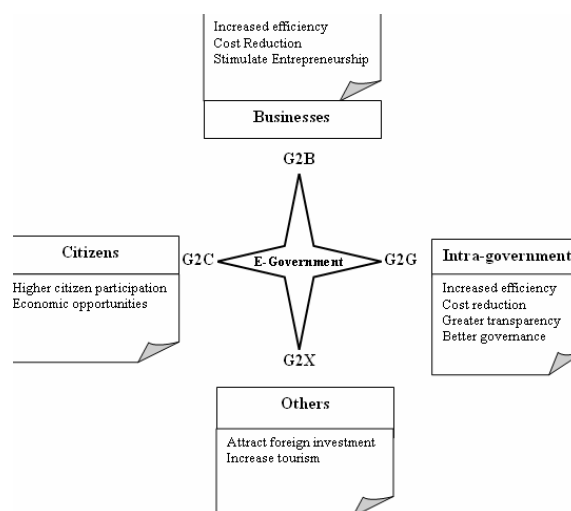


Fig 1: Different types of government interactions [10]

1.2 Late of African States

In this global movement, it is clear to deplore, behaviour of indifference of some African countries. Often characterized by low incomes, inadequate infrastructure, not well trained executives and especially an hazardous project management, African states are

naturally late in understanding ICT issues in general and e -gov in particular (cf. Table 2)

Everything happened as if they did not feel concerned by these changes. However, if the delay of industrialization in Africa has been able to understand, a prolonged delay in the information society could make risk of letting the continent out of play in the context of globalization. Africa is now more than ever challenged to pay attention quickly to avoid missing the turn of the millennium. It is in this sense that the World Bank and other international donors, under the label ICT4D (ICT for development), emphasized "the relevance of ICT in general and e-government in particular as a mean of promotion and development to reduce poverty "» [2].

For proper management of e-gov projects, new practices and new methods are emerging. Now, some countries have moved to the final stage of maturity of e-government systems. These include the European countries (Finland, Luxembourg, Belgium etc ...); American countries

(USA, Canada) and some Asian countries (South Korea, Singapore, Japan ...). Among African, Seychelles, South Africa and the Maghreb countries have distinguished in a positive way to step transactions (cf. table 3).

However, most other countries of the continent remained in stage of presence characterized by the existence of websites and interactive little less well developed. With this situation, African countries, and more particularly Sub-Saharan countries, are at the bottom of the panorama of world ranking of states in terms of implementation of e-gov projects. These include Mali, Burkina Faso, Niger, Chad and many others. Does Africa have a chance to catch up?

Table 2. E-government development in Eastern Africa [11]

Country	<i>E-gov development index</i>		<i>Word e-gov development ranking</i>	
	2012	2010	2012	2010
Seychelles	0.5192	0.4179	84	104
Mauritius	0.5066	0.4645	93	77
Kenya	0.4212	0.3338	119	124
Zimbabwe	0.3583	0.3230	133	129
United Republic of Tanzania	0.3311	0.2926	139	137
Rwanda	0.3291	0.2749	140	148
Uganda	0.3185	0.2812	143	142
Madagascar	0.3054	0.2890	148	139
Zambia	0.2910	0.2810	154	143
Mozambique	0.2786	0.2288	158	161
Malawi	0.2740	0.2357	159	159
Comoros	0.2358	0.2327	171	160
Ethiopia	0.2306	0.2033	172	172
Burundi	0.2288	0.2014	173	174
Djibouti	0.2228	0.2059	176	170
Eritrea	0.2043	0.1859	180	175
Somalia	0.0640	0.0000	190	N/A

Table 3. E-government development in Eastern Africa [11]

Rank	Country	<i>E-gov development index</i>		<i>Word e-gov development ranking</i>	
		2012	2010	2012	2010
1	Seychelles	0.5192	0.4179	84	104
2	Mauritius	0.5066	0.4645	93	77
3	South Africa	0.4869	0.4306	101	97
4	Tunisia	0.4833	0.4826	103	66
5	Egypt	0.4611	0.4518	107	86
6	Cape Verde	0.4297	0.4054	118	108
7	Kenya	0.4212	0.3338	119	124
8	Morocco	0.4209	0.3287	120	126
9	Botswana	0.4186	0.3637	121	117
10	Namibia	0.3937	0.3314	123	125
Regional average		0.2780	0.2733		
Word average		0.4882	0.4406		

2. Problematic

Northern countries, some Asian countries, and those in America have for the most part been able to identify the difficulties encountered in implementing e-government systems. Also, they have made adapted arrangements to pass the challenge of implementing e-government infrastructure. This result can also be justified by the availability of viable infrastructure, human potential and certainly by the application of benefits of new disciplines such as change management, content management and of course Knowledge Management (KM).

If African countries do not have the benefit of having sustainable infrastructure due to the lack of financial and targeted educational strategies, they can at least learn from the experience of others to avoid some failures. Would it be impossible to focus on the successes of each other to make their way to successfully adapt to its environment and its socio-cultural context? We believe that this is a track that would enable those States to offer e-government infrastructure, taking into account their financial capacity, the state of their infrastructure and quality of their human resources. The non-inclusion of Knowledge Management in implementing e-government systems in these countries could be one reason for the delay or failure observed? Is it impossible to design a conceptual framework for KM in the field of e-gov? After the establishment of an e-government infrastructure, is it possible to turn it as a suitable support for the implementation of knowledge management project? Such are the questions to which the present article will attempt to give answers, knowing that the failure of e-government in Africa is multidimensional, his track of KM being only one among others.

The remainder of this paper is organized as follows: Section 2 is devoted to general KM presenting its genesis and its various phases of implementation. Section 3 is devoted to KM for the e-gov in African states. It presents the undertaken approach (SWOT), based on the analysis of strengths, weaknesses, opportunities and threats of this type of project, and our proposed model of knowledge acquisition. Section 4, in turn, deals with e-gov as a support of KM by providing an overview of our model of knowledge transfer.

II-BACKGROUND ON KM

1. Genesis and Definitions

The earliest studies related to the concept date from the time of Plato and Aristotle. However, it is the work of the philosopher Michael Polanyi [12] that is considered as basis for theories and books on knowledge management. This is precisely the philosopher who emphasizes that knowledge comes from two bases that are tacit and explicit, also known as informal and non-codified; and formal and codified. "Explicit knowledge comes from books, documents, databases and manuals, while the tacit can be found only in the minds of agents, in the customer experience, in the minds of sellers ... However these are all important for the knowledge discipline"[13].

Knowledge is more than information. As long as information is not used, it can not be considered as knowledge. This is why we say that "knowledge is information in action." Similarly, the data is not knowledge until they are converted into information and then into action" [13].

As part of the e-gov, the KM consists of four components: data, information, knowledge and wisdom. Data are facts and figures, information symbolize the interpretation of data, Knowledge is the use of information (data + interpretation + use), and finally Wisdom that sits on top of the pyramid (cf. Figure 1) represents the application of knowledge (data + interpretation + use+ application)

According to Smith [12], "The Knowledge Management is defined as a conscious strategy of transfer of real knowledge, to real people, at the right time, allowing each other to share and put information into action, helping an organization to improve its organizational performance".

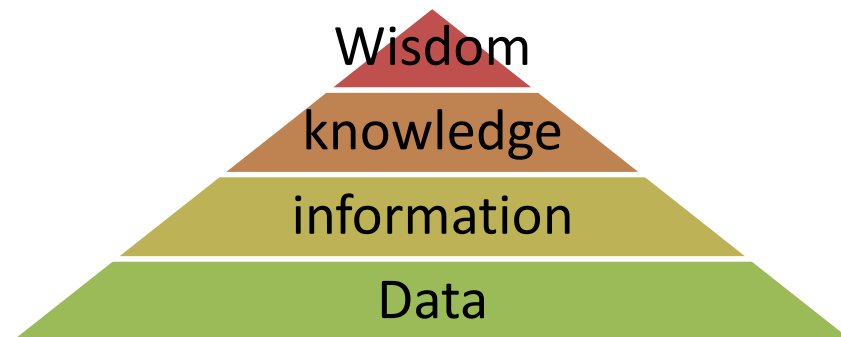


Fig 2: Pyramid of knowledge in e-gov [14]

The KM is a project in itself that requires a process of implementation. We define in following section the different phases of this process.

2. Different phases of KM

Managing knowledge and transferring best practices is theoretically simple, but difficult to apply. For any knowledge management initiative and transfer of best practices, the following phases must be performed. This is the framing, Diagnostic, Search Solution and Implementation[15]. These phases are illustrated in the next figure

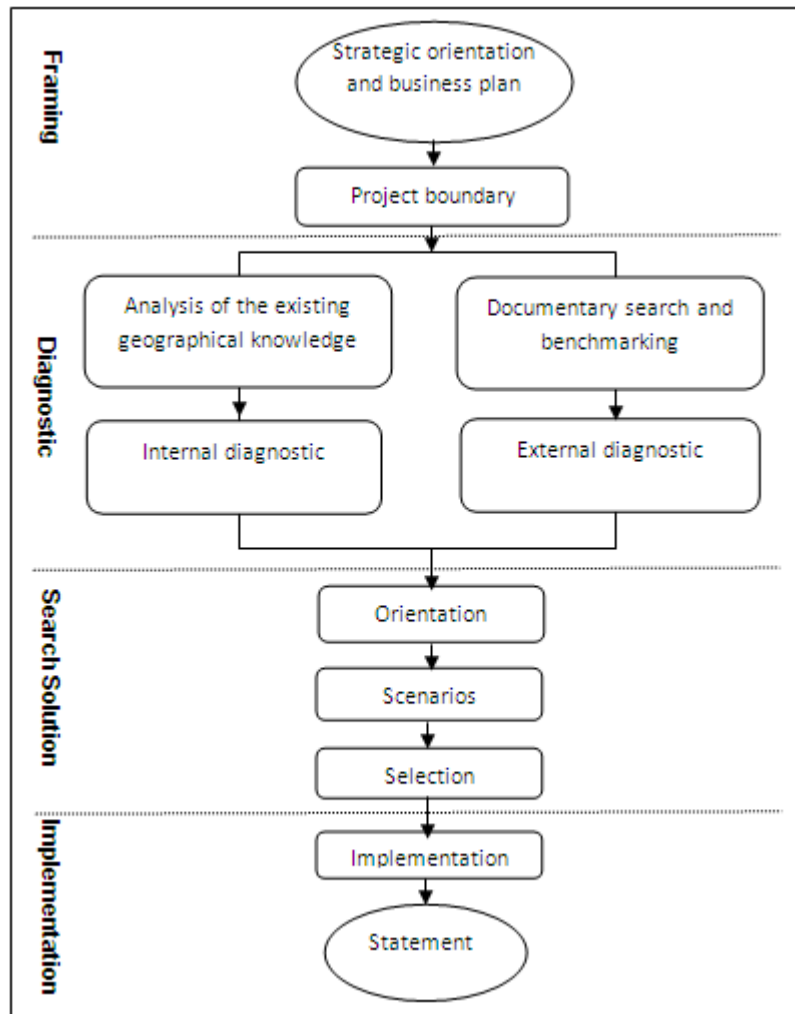


Fig 3: Approach of a KM project implementation

This is a general framework for implementing a KM project. For specific cases of KM for African countries e-gov and particularly KM for and by e-gov, these phases will be incorporated in various models that we have developed for this purpose. To elaborate these models, we relied on the analysis of strengths, weaknesses, opportunities and threats of these kinds of projects in developing countries.

III-THE KM FOR AFRICAN STATES'S E-GOV

1- SWOT analysis for KM project

To propose a model of knowledge acquisition which allow African states to use KM to implement e-government infrastructure, we will first carry out a SWOT analysis of the feasibility. We will highlight strengths, weaknesses, opportunities and threats of such an initiative.

1.1 strengths

- Advantages of the last incoming

African states are undoubtedly the last to realize the importance of e-government in this era of information society. This delay is certainly detrimental to its adaptation to this new

society, but we have to acknowledge that it may also have advantages. This is indeed a possibility to avoid engaging in major investments without knowing whether it'll work or not. By staying in decline, these states have had time to observe how early entries do it, what difficulties they face and how they do about it.

- **Adoption of the other's solutions**

With this decline due to the advantage of last comer, African states can learn from the experience of pioneers. In particular they may send their technical staff to study and learn from those states which took the risk of starting forward. However, we must be careful, and this is the interest of this article, because it is not enough to find themselves among the pioneers to learn, but they especially need a wanted and accepted strategy from others for a possible transfer of knowledge. It is necessary that those who hold this knowledge agree to share it.

1.2 Weaknesses

- **Difficulty of sharing knowledge**

States can be successful pioneers for the implementation of e-government infrastructure, but this does not mean it will be easy to benefit from their experience. It is not sure that these states are ready to welcome foreign people to share their knowledge? In any case it is not obvious.

- **Financing study missions**

Sending executives abroad for internships and professional training requires a certain cost, especially when it is a long period.

1.3 Opportunities

- **Bilateral cooperation**

States often have bilateral cooperation to promote the sharing of experience and knowledge. These are opportunities available to African executives to benefit from the experience of others.

- **Multilateral cooperation**

Some states or organizations regularly organize conferences, seminars and forums in order to glimpse a better future on certain aspects or crosscutting issues, challenging everyone. These meetings can promote exchanges of experience sharing and knowledge transfer.

1.4 Threats

- **Inadequate knowledge**

The knowledge gained outside is not necessarily applicable in the African context. Some factors related to culture, customs and ways of each one can play an important role in the adaptation of knowledge.

1.5 Matrix of factors

SWOT analysis allowed us to see how to take advantage of the situation at best by the use of a table crossover factor [16] (cf. table 4). This cross can identify a process oriented success of project. To complete this table we used two specific methods. This will include the benchmarking and the FAQ (frequently asked questions).

Benchmarking means mark or milestone. This is an effort to share best practices[15]. There are three types of benchmarking: the internal, competitive and generic benchmarking. In our case we must seek to take advantage of external knowledge. It is the generic benchmarking that interest us. Indeed, it allows comparing processes, seeing which ones are appropriate for a given context. For its implementation, there are following steps: organization, planning of resources, establishment of the repository, implementation, analysis, and action plan.

The FAQ is intended to organize different questions and their answers based on a problematic accurate. In our case the problem is: how to set up an e-gov infrastructure tailored to African countries. It concerns the detection of knowledge to capitalize. It lists the issues and the most frequently asked questions. For its implementation, there are several steps: identifying issues, classification, writing answers and disseminating produced document. Its boundaries are unable to be exhaustive on issues. This is why the FAQ should be updated continuously.

We illustrate this approach by the following example:

- ✓ Force: knowledge of others,
- ✓ Weaknesses: difficult to share knowledge,
- ✓ Opportunity: cooperation,
- ✓ Threat: inadequate knowledge

Table 4. Matrix of SWOT factors

		<i>Internal Approach</i>		
		List of strenghts	List of weaknesses	of
		How to maximize strengths?	How to minimize weaknesses?	Examine how strengths can control weaknesses
External approach	List of opportunities:	How to maximize opportunities?	How to use strengths to take advantage of opportunities?	How to correct weaknesses by taking advantage of opportunities?
	List of threats :	How to minimize threats?	How to use strengths to reduce threats?	How to minimize weaknesses and threats?
	Consider how opportunities can control threats			

Based on these SWOT factors, we can make the crosses for the following:

- ✓ Opportunity to increase strength: use cooperation to get the knowledge of other
- ✓ Opportunity to reduce threat: cooperate to obtain appropriate knowledge
- ✓ force to reduce weakness: using knowledge of others to avoid inadequate knowledge.

Final Decision: use of bilateral cooperation to obtain appropriate knowledge of other

2- Acquisition Model of best practices

Based on the SWOT analysis and Crossing of its factors, we proposed a generic model that allows the acquisition of knowledge. In this model, we have three components which are: value propositions, processes and enablers (cf. figure 4).

The value propositions are objective value of the approach. They consist of: (i) operational excellence and (ii) the quality of retrieved knowledge. Operational excellence enables searching of competitiveness and resilience to organizational agility. It is a way to optimize resources by using appropriate methods to the context in which the organization is leveraging knowledge. The quality of knowledge is the useful knowledge, adapted to an environment, and a given crop.

Processes present stages of the project or its life cycle. These are the analysis, vision, targeting, capture, processing, adaptation, use and evolution. Indeed, the analysis allows stating places about which we know before looking for the right thing, what kind of knowledge you want to acquire, how we will acquire it, with what means and who will acquire it. The vision represents the overall direction prepared by the managerial staff and to serve as a benchmark for business. Targeting is to define all oriented aims of the predefined view. Capture constitute the organizational memory by recovering Knowledge of formal or informal (tacit or explicit). Processing allows the passage of data and information received to an interpretation in a given context. This is the creation of knowledge. The adaptation is an important process of appropriation of knowledge to align with strategies defined.

Enablers are factors that promote the implementation of the project. These are: motivation, collaboration, infrastructure, technology, training, and formalizing the measures

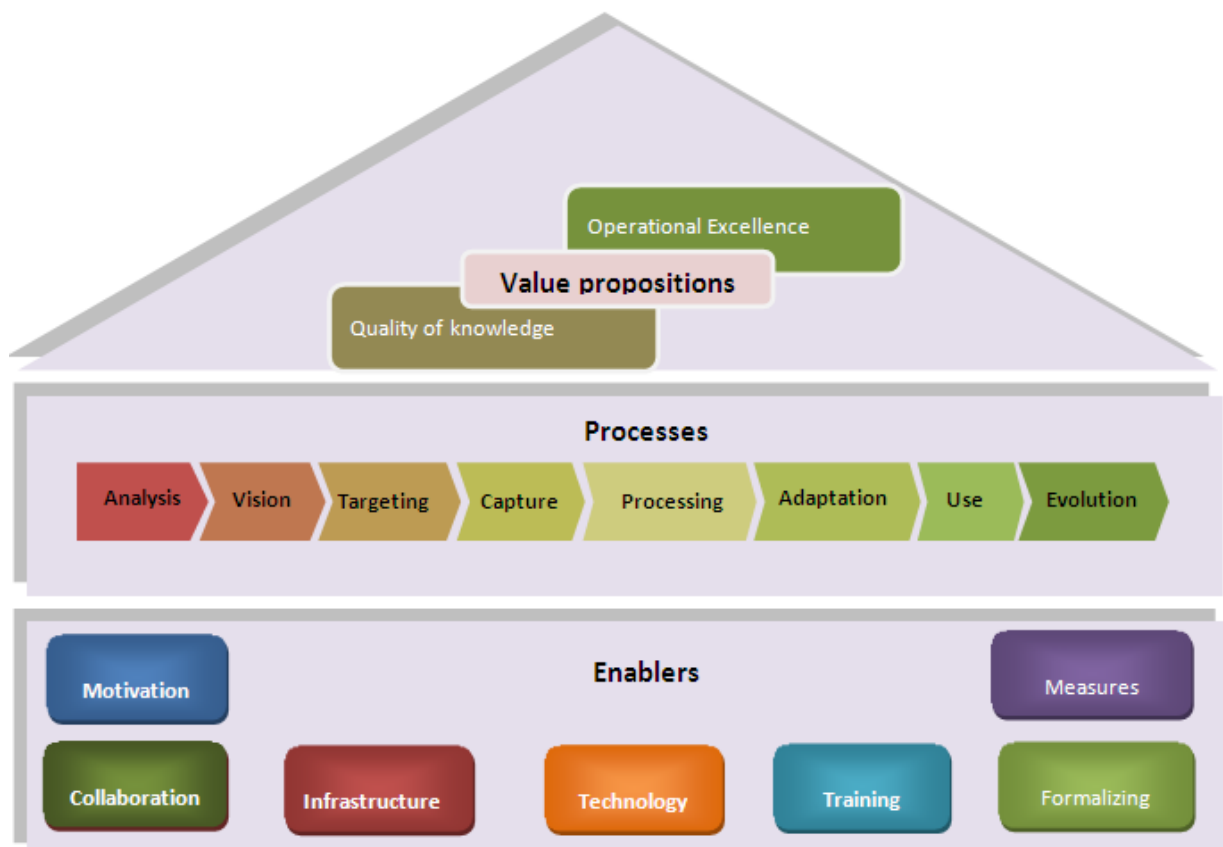


Fig 4: Model of knowledge acquisition

The acquisition of knowledge model has allowed us to define the approach that permits African states to use KM to implement e-gov projects. We explored various tracks in the use of KM implementation of their e-gov projects. We present in the next section our proposal of knowledge transfer model to employees of public service through the use of e-government infrastructure. This considered the e-gov as a support of KM.

IV-e-gov as a support of KM

Before embarking on a proposed transfer model to define some practices, it seems necessary to realize SWOT analysis which is a strategic analysis tool combining the study of strengths and weaknesses with those opportunities and threats in order to help us to define the various components of this model. Furthermore, the table used in the crossover part of the acquisition is also used to cross the SWOT factors allowing us to achieve a successful approach.

1. SWOT analysis of e-gov for KM

1.1 Strengths

- Availability of physical data

The physical data (documents, records, books) are available in the administrative services. They can form an informational base which will be usable for the KM

- Human resources mobilized

Every government has its human resources who will contribute and collaborate in the implementation of a KM infrastructure in the administration

1.2 Weaknesses

- Unavailability of digital data

There will be a lack of digital data at the beginning of the e-gov project. This lack will be remedied as soon as the project is set up and physical data transformed.

- Lack of digital literacy

Digital culture will default because African states are at the beginning of the use of online services

1.3 Opportunities

- Infrastructure and technologies

The e-government infrastructure is an adequate infrastructure to support information and data generating knowledge. The principle of e-gov is based on workflow methods for routing data.

- Accessibility to information

Information will be more accessible as the foundation of e-gov is based on the accessibility of information through public access terminals or Internet service.

1.4 Threats

- Problems of cyber security

The concept of cyber security is the risk faced by users of computer systems and networks to see their data being manipulated, their password pirated and their computer programs damaged. This is a real threat to the e-government.

- Cultural issues

In some cases, resistance to change related to cultural challenges will transform new knowledge absorption in major obstacle

2. Best practices transfer Model

Knowledge transfer requires good organization, good methodology, but also an appropriate mean of information routing. As such, e-gov technology is rightly a key means of collection and transfer of information and knowledge.

As part of this article, a generic model is developed (cf. Figure 5) taking into account the previous work that have examined this issue. We think particularly the work of Polanyi. In this model, we have the following components: value propositions, processes and enablers.

The **value propositions** are considered as targets of value underlying this approach. These are the quality of service to users of e-gov, operational quality that allows transactions, the quality decision-making system managers and user satisfaction.

Processes are the steps involved in knowledge transfer. These are the analysis, vision, planning, implementation, intensification, and organization.

Enablers are the elements that promote transfer. This is culture, technology, infrastructure, human potential, leadership, and action.

For this generic model, there are existing methods, which follow the main directions of this last through the transfer of best practices. Using this method, we will analyze a case practice of knowledge transfer. This is the **wiki method** which is one of the knowledge transfer methods based on e-government [17].

A Wiki is a collection of web pages linked together. They are created and updated by a set of participants or employees and managed by an appropriate software [18]. The first Wiki was created in 1995 through the work of Ward Cunningham. Its main features are: published documents have collective authors; the publication is not instantaneous; a hyperlink that points nowhere permits the creation of new pages. Among its principles, we can see the opening (anyone can add, correct or arrange a page); the incrementally (a page can include one another); organization (structure and content of the sites are open to editing and evolution) and then of universality (the mechanisms of editing and organization are the same for all).

Given its characteristics and its principles, we may well use the Wiki technique for transferring knowledge in e-gov infrastructure. Employees who will edit the pages will be necessarily public employees grouped into services or departments. These latter will initiate wiki pages, improve them and ensure their permanence assignment for the benefit of users of public administration. Most important is the possibility of transfer between services with the flexibility that allows the modification of Wiki technique. After all the purpose of KM is knowledge sharing.

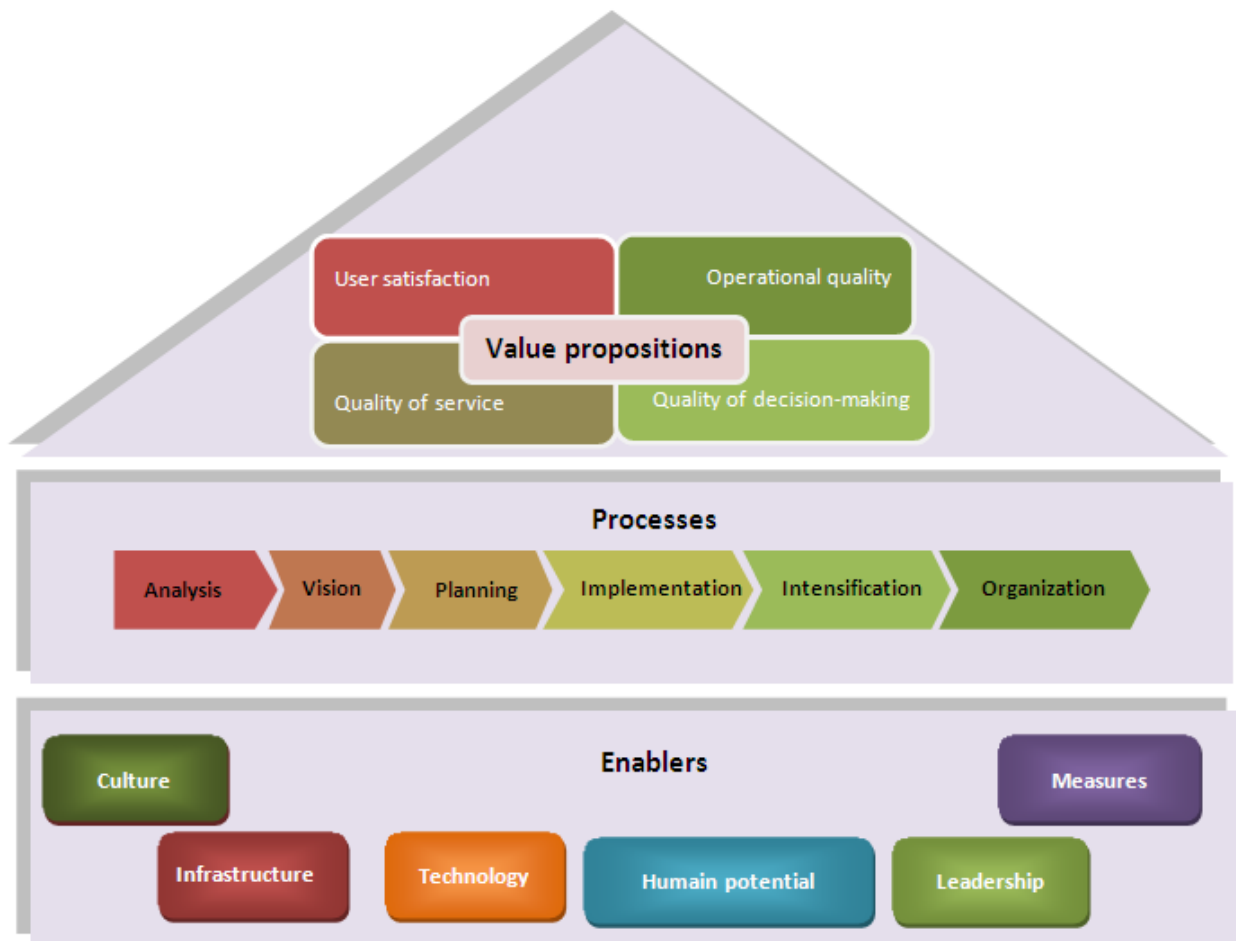


Fig 5: Best practices transfer model

CONCLUSION

Knowledge Management is a discipline that assists organizations in creating and managing Knowledge. As such it is used in business as well as in administration.

In this paper, the issue was to explore the possibilities of use of KM in the implementation of e-gov projects in African states on the one hand and the transfer of knowledge to public employees through the e-government infrastructure in other hand. Analysis of strengths, weaknesses, opportunities and threats of this type of project has allowed initiating two models, one for acquisition of best practices and the other for transfer of knowledge between employees. They are inspired by the work of Michael Polanyi and are for the occasion reviewed to be adapted to the context of developing countries. These models can therefore serve as reference for acquisition and knowledge transfer in African countries context.

The practical cases of Benchmarking, FAQ and Wiki were used to illustrate these models in practice. At this stage of development of e-government projects in these states, there has never been more appropriate to refer to good practice of the pioneers in order to prevent these countries to fail their strategy in implementing their technological infrastructure.

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