

Where The Global Needs The Local: Variation in Enablers in the Knowledge Management Process

Adekunle Okunoye
Turku Center for Computer Science TUCS
University of Turku, Department of Information Technology
Lemminkäisenkatu 14 A, 2nd floor
20520 Turku
Finland

Email: adeokun@cs.utu.fi
(Corresponding author)

Helena Karsten
University of Turku and TUCS
Lemminkäisenkatu 14 A, 2nd floor
20520 Turku
Finland

Email: eija.karsten@cs.utu.fi

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Abstract

Knowledge management (KM) is a focus for knowledge-intensive businesses and organisations, irrespective of the size and geographical location. While it is important to make the local knowledge become global, the efforts to manage the knowledge processes and the specific impact of the enablers require thorough understanding of the local factors to ensure its success and sustainability. Most of the previous models and frameworks of KM do not consider the differences in regions and countries and the specific local organisational factors that could affect KM. We conducted an empirical study of six research organisations in sub-Saharan Africa to understand the particular local context in which the KM occurs. We identified variations in factors such as the local cultures and beliefs, the persistent underfunding, and the operating environment influences in these organisations. Based on these, we argue for the importance of a context specific model of KM.

Keywords: knowledge management, developing countries, knowledge management processes and enablers, research organisations, sub-Saharan Africa

INTRODUCTION

The balance between knowledge and resources has shifted so far towards the former that knowledge has become perhaps the most important factor determining the standard of living - more than land, than tools, than labour (The World Bank Group 1999a, KPMG, 1998). Knowledge is increasingly becoming the driving force of economic growth, social development, and job creation. In the global digital age, the emphasis has shifted from an asset-based economy to a knowledge-based economy (OECD, 2001). This has led to a growing interest in managing various forms of knowledge, be it possessed by people, embedded in products and systems, or put into some explicit form. Earlier, this shifting seemed to be only occurring in the industrialised countries of the North and thus most efforts to manage knowledge in organisations have considered only these regions. However, now that knowledge management (KM) has become a global issue, it is important to understand the essential local (technological, cultural, social, organisational, environmental etc) factors in managing knowledge before applying any model or framework. Also, these models might not be at all relevant in developing countries, and there is a need to develop a new model that takes into consideration the context of the organisations there. Also, one of the real tests of a global company is its ability to leverage these local factors.

Global companies need to recognise different local beliefs and cultures and their influences to KM and organisational effectiveness. For instance, a leadership style and organisational structure suitable for a given national culture may not necessarily be appropriate in the context of another national culture (Jarvenpaa and Immonen 1996). These have been the major issues considered in the cross-cultural management. One of the main reasons behind KM efforts of global organisations is to transfer best practices. However,

Schneider and Barsoux (1997) argue against the notion of universal wisdom and the transferability of best practices, based on their analysis of different models of organising which have evolved from underlying cultural assumptions. We also here like to point out that KM is not KM everywhere and best practises cannot simply be transferred elsewhere.

We conducted an exploratory case study to examine how availability of information technology infrastructure (ITI) and other enablers influence the nature of KM efforts in research organisations in sub-Saharan Africa (Okunoye & Karsten 2001, 2002). The overall goal of our study is to complement the earlier works in the West and Japan (Nonaka and Takeuchi, 1995; APQC, 1996; Davenport and Prusak, 1998) and contribute towards developing a model that could be relevant to organisations in developing countries. In this article, our focus is on the enablers and especially on their specific nature in the context of sub-Saharan Africa.

According to Cerny (1996), organisations have realised that there is a need to get the right local knowledge to the right people at the right time globally across the organisation, in order to remain competitive. The growing demand for knowledge-based products and services is changing the structure of global economy; thus the role of knowledge in business success is becoming an important management issue in all sectors (Davenport & Prusak, 1998). As a result, many organisations are exploring the field of KM for new approaches to achieving and sustaining competitive advantage (Dzinkowski, 2000). The hype and fad that surrounds KM is dying down and it has come to be recognised important to organisations at all times (Davenport and Grover, 2001). KM is no longer the issue of multinational companies or the international consulting firms or the organisations in the western industrialised countries alone. It has become the fabric of successful businesses and

organisations irrespective of their size and geographical location (Davenport and Grover, 2001).

KM is a complex process that must be supported by a strong foundation of enablers, such as strategy and leadership, culture, measurement, and technology (APQC, 1996). Information and communication technologies (ICTs) are the primary enablers of KM. They have also made the global KM possible. They are a means for an organisation to extend their knowledge resources beyond the limitations of here and now (Broadbent, Weill, and St. Clair, 1999). Several models, frameworks and implementations of KM include ICT. Alone, ICTs cannot deliver KM (McDermott, 1999), but due to their capabilities and their perceived influence in supporting codification of knowledge, their imbalance in relation to the other enablers in a model might make the KM difficult or at least that it has to take a different form (APQC, 1996).

There are enough successful cases of KM implementations: BT Labs, Skandia, Mobil, Buckman Laboratories, Mobil, HP etc. (see Beers, 1995; Bartlett and Mahmood, 1996; Warren and Davies, 2000 for some cases), models and frameworks (see Holsapple and Joshi 1999; Lai and Chu, 2000 for a detailed review), and bodies of literature based on works by Nonaka and Takeuchi (1995), Davenport and Prusak (1998), and Leonard-Barton (1998). Nevertheless, most of these do not consider the differences of regions and countries and the specific local factors that could affect KM. Becerra-Fernandez and Sabherwal (2001) recently remarked that the majority of the tools, methodologies, and processes of KM may not be universally appropriate and suggested an approach that will consider the particular context in which the KM occurs. While it is important to make the local knowledge become global (Cerny, 1996), a thorough understanding of the local factors is needed to ensure the success and sustainability of KM.

Most models of KM have taken the availability of ICT in organisations for granted and placed more emphasis on the other enablers. The different organisational cultures, structures and management styles, based on local orientation and beliefs, are often not reflected or provided for in these models. An attempt to apply these to a situation outside their original environment might not be successful. For example, in developing countries, where a sufficiently robust IT infrastructure does not exist (Odedra, Lawrie, Bennett, and Goodman, 1993; Moyo, 1996), KM efforts are unlikely to gain the importance and focus, or the expected outcomes, with the current models and frameworks. Similarly, differences have been noted in the organisational structure and management style between the organisations in the US and Japan (Hedlund, 1994; Cusumano and Nobeoka, 1998). Thus, structure and management strategy could also be affected by different national cultures. All these specifics in the enablers, combined together, could affect the KM implementation. Thus a model that would incorporate the local situation and circumstances appears to be needed.

THE KNOWLEDGE MANAGEMENT PROCESS AND ITS ENABLERS

KM can be described as the systematic process of finding, selecting, organizing, distilling and presenting knowledge in a way that improves an employee's comprehension in a specific area of interest (UTA, 1998). KM helps an organization to gain insight and understanding from its own experience. Specific KM activities help focus the organization on acquiring, storing and utilizing knowledge for such things as problem solving, dynamic learning, strategic planning and decision making. It also protects intellectual assets from decay, adds to firm intelligence and provides increased flexibility (UTA, 1998).

Various authors have discussed knowledge processes using different categorisations and labels (see Lai and Chu, 2000, Holsapple and Joshi, 1999;

Rubenstein-Montano et al.2001 for reviews). These processes are interwoven. It is difficult to distinguish between the activities involved in one process from another. Most often, one activity extends beyond one process. Thus they could be best represented in a continuum.

To categorise the knowledge processes, we will use the seven processes described by Bukowitz and Williams (1999) and the American Productivity and Quality Center APQC (1996). Bukowitz and Williams (1999) broadly divided the processes into tactical and strategic ones (Figure 1), where the tactical side of the framework is concerned with the process of gathering the information needed for daily work, using of knowledge to create value, learning and contributing back into the system to make knowledge available to others. The strategic process involves realising value from the tactical process where the organisation's knowledge strategy is harnessed with the goals of the organisation. These processes require assessment and valuations of the knowledge assets for future use. Building and sustaining knowledge sources is also of strategic importance in organisations.

APQC (1996) puts all these processes in the center of their framework and surrounds it with enablers which could help or hinder the knowledge processes (see Figure 1). The enablers that they include in KM are strategy and leadership, culture, measurement, and technology. Each of these must be designed and managed in alignment with the others and in support of the KM process.



Figure 1. The APQC Knowledge Management Framework (APQC, 1996, Bukowitz and Williams, 1999)

We found this combination of the two frameworks (presented by APQC, 1996 and Bukowitz and Williams, 1999) to be a good starting point to study KM also in our case organisations. These frameworks seem to cover most of what is being described in other models and frameworks. However, they are drawn from a case of multinational organisations whose primary aim is to leverage their global knowledge and share best practices in all their divisions around the world. Thus, these frameworks tend to forget the local issues that might be involved. Also, often the circumstances of these multinationals in their host countries cannot be compared with those of the local, national organisations. We next discuss these four groups of enablers, supplementing the APQC outlines with other analyses.

Strategy and leadership

According to Edgar Schein (1999), leadership is ability to rise to the occasion, filling the missing functions, and evolving or changing the culture as needed. He singles out the evolving and changing culture as the most difficult one to achieve because this requires the leaders to understand the culture of the organisation and to have the ability to predict the necessary changes

required for effectiveness of the organisation. This explanation shows the tight link between organisational culture and leadership. The commitment of the organisation leadership could facilitate or inhibit the development of knowledge sharing culture in an organisation. Without the full commitment of top leadership as the champion of KM and without an appropriate strategy, the KM efforts could be difficult (Davenport and Prusak, 1998). To support the top management, many organisations have created specific knowledge roles to direct their KM initiatives. However, the same strategy and leadership might not produce the same effect in a different cultural context

Culture

Organisational culture could simply be viewed as how the things are done in a particular setting. Schein (1985) defined organisational culture as a set of core values, behavioural norms, artefacts, and behavioural patterns, which govern the way people in an organisation interact with each other and invest energy in their jobs and in the organisation at large. It is often related to ownership of the enterprise, leadership and management practices and contextual factors in the business environment. Organisational culture could play a significant role in KM. McDermott and O'Dell (2001) found out that organisations that have a knowledge sharing culture, adapt this directly to KM. For organisations to successfully manage their knowledge and foster sharing between individual and groups within and outside the organisations there should be changes in the organisational culture (Davenport and Klahr, 1998; Davenport, De Long, and Beer, 1998; Davenport and Prusak 1998).

Measurement

According to Holsapple and Joshi (2000), “measurement involves the valuation of knowledge resources and processors”. It could be a basis for appraisal of the other enablers and means of linking KM to organisational performance. Even though it is possible to measure KM's impact on

organisational performance, measurement is still the least developed and under-implemented aspect of the enablers in organisations (APQC, 1996; Holsapple and Joshi, 2000).

Technology

Technology can enable the integration of various systems to function effectively to support communication and collaboration (Zack and Serino, 1996; Lotus 1998, 2001). The importance of technology in KM has given rise to a new set of information systems being referred to as KM systems which could support the KM processes described earlier (Alavi and Leidner, 2001). There are various information technologies such as data warehousing, intranet, Internet, groupware and others (Borghoff and Pareschi, 1998) that could work together as KM system. They, however, play different roles in their particular uses.

THE STUDY

In an attempt to explore the KM efforts of organisations in developing countries, an empirical study was conducted in six research organisations in sub-Saharan Africa. These organisations are the International Institute of Tropical Agriculture (IITA), Nigeria Institute for Social Economic Research (NISER), and the Nigeria Institute for Medical Research (NIMR) in Nigeria, and the International Trypanotolerance Center (ITC), National Agricultural Research Institute (NARI), and the Medical Research Center (MRC) in The Gambia. Nigeria and The Gambia were selected as the countries to be studied, because they allow comparison between two countries with different levels of IT infrastructure. For example, in telecommunications, The Gambia has a significantly higher penetration (The World Bank Group, 1999b). Even though these two countries are widely different in terms of economy, political and social life, and infrastructures, they offered us circumstances that could be contrasted with those in industrialised nations. In approaching the specific

institutes, our aim was to have the same number and type of institutes in both countries. We also wanted to compare national to international institutions. This study seeks to answer the following questions:

- What kind of efforts related to managing the knowledge are currently (or have been recently) actual in research organisations selected for study?
- What kind of enablers, including information technology infrastructure, are available in them?

The KM processes and the enablers – with a particular emphasis on information technology – were examined through an exploratory case study and analysis (Yin, 1994) of six different organisations. The study used several methods (see Okunoye and Karsten 2001 for more detail) of data gathering: semi-structured interviews were complemented with short time on-site observations and surveys with quantified responses (Table 1). Organisational documentation and presentations by senior management about their KM-related initiatives were collected and analysed. Multiple respondents were sought in each organisation to achieve triangulation of data and insights. A comparable approach in data gathering has been applied in similar studies (Broadbent et al., 1999; Nidumolu, Subramani, and Aldrich, 2001).

Table 1. Data gathering methods per each research question

Research question	Main data gathering method	Supplemented by
KM efforts currently actual	KMD questionnaire	Interviews, observations, documents
KM enablers, including ITI	Documents and presentations, interviews, observations	KMD questionnaire

KM was evaluated using the KM diagnostic (KMD) created by Bukowitz and Williams (1999). KMD enabled us to know of the KM efforts of an organisation, also when these efforts are not called ‘KM’. This KMD is presented in a book (Bukowitz and Williams 1999) that offers a detailed

framework for thinking about the KM process. In the discussion of each process, several examples of organisations in the Western countries are used as an illustration. The KMD includes several assumptions that might not necessarily be relevant to developing countries. We used this questionnaire with full understanding of these limitations and provide for these shortcomings with in the qualitative data.

The KMD consists of 140 statements, for example “When people are given the task of searching for information, they are able to fulfill the request.” The respondents are asked whether the statement is strongly, moderately, or weakly descriptive of their organisation. There are seven sections in the KMD, corresponding to the seven stages of the knowledge process, each with 20 statements. The sections are listed in Table 2, with examples of statements from each one.

Table 2. Sections of KMD

Section	Example(s) of statements
1. Getting information	<i>“Communities of specialists are easy to identify, making it clear to others in the organisation where to go for specific information.”</i>
2. Using information	<i>“We give all promising ideas thorough consideration, no matter who they come from.”</i>
3. Learning	<i>“When we have a big success, we talk together about what we did right.”</i>
4. Contributing	<i>“People would say that sharing knowledge does not diminish the individual’s value to the organisation.”</i>
5. Assessment	<i>“Senior management assesses what knowledge needs to be developed when it allocates resources.”</i> <i>“We have mapped the process flow of knowledge management activities.”</i>
6. Building and sustaining a knowledge base	<i>“People know when it is not appropriate to share knowledge externally.”</i> <i>“Our IT systems connect us to information sources we need to do our work.”</i> <i>“We routinely ask ourselves how we can leverage our knowledge into other areas.”</i>
7. Divesting knowledge	<i>“When a new opportunity arises, we first try to retool our existing skills before we hire a lot of new people.”</i> <i>“We outsource skills and expertise that do not support our core competencies.”</i>

Even though the KM diagnostic already included some statements about the use of IT, it was also approached from the ITI perspective, by an

assessment of information technology infrastructure using the list developed by Broadbent and Weill (1997), based on their empirical research on twenty-seven firms in seven countries. We compared the availability of IT infrastructure and its use in each of the six organisations with their KM efforts. While our major focus was on IT, our methods also enabled us to record the influence of culture, structure, leadership, and management and to be open to any other enablers. The KM diagnostic were completed by various cadres of research scientists, library staff, information technology and administrative staffs. The ITI list was filled out with the head of computing section or person responsible for information technology.

Our study attempts to assess KM from perspective of organisations in developing countries, in order to understand the local factors in the KM processes and the situated nature of the enablers and assumptions which have not been recorded in earlier studies. This study has also its limitations. We relied on multiple respondents (48 in total) and several methods of data gathering. This eliminated the bias of single informant but made the study prone to under- or over-reporting due to selection of the informants (Gold, Malhotra, and Segars, 2001), however we tried to reduce this by careful selection of informants at various cadres. We have studied non-profit research organisations and some phenomena we discuss might not be the same in profit-based research and business organisations.

KNOWLEDGE MANAGEMENT PROCESSES

The assessment of KM efforts revealed that the research organisations generally performed well in their efforts in creating, finding and collecting internal knowledge and best practices. They averaged in sharing and understanding those practises and were weak in adapting and applying the practises to new situations. That is, the organisations performed reasonably well in the tactical processes and averagely in the strategic processes of KM.

According to Bukowitz and Williams (1999), this could be interpreted that the case organisations put more effort into managing the day-to-day knowledge, as they are required to respond to demands or opportunities in marketplace, compared to the long range process of matching organisational knowledge assets to strategic requirements. A summary per each part of the process is in Table 3.

The research institutes we studied all have a well-established process of *getting* knowledge, which does not necessarily involve much use of information technology. Most of the organisations still use manual ways of managing documents through filing. They have invested in the library and encouraged informal networks of experts for knowledge sharing and acquisition. They are confronted with the problem of stocking their library with modern books and current journals as well as when applying information technology to support some of their efforts in getting knowledge. How well the researchers *use* their acquired knowledge is measured through the record of their publications and rewarded by promotion and support for further funding. Some of the organisations also encourage individual projects, which drive innovation and application of knowledge.

Table 3: Summary of knowledge management processes

Process	Key findings
Get	All the organisations use collaborative means to get knowledge. Library and documentation unit is central as a knowledge source.
Use	Research work involves getting knowledge from diverse sources. Publishing research results is a major way of externalising knowledge and measuring knowledge application. Some organisations indirectly hinder the free use of knowledge and slow down innovation. Encouraging individual initiative enhances knowledge application.
Learn	Organisations that incorporate learning into their processes perform better in managing knowledge. Organisations accumulate experience and could learn from it.
Contribute	Time is a major constraint for contributing to knowledge repository. Knowledge is a source of power, especially new knowledge. Trust is important for knowledge contribution. Contributing to knowledge repositories should be part of the normal work process.
Assess	Organisations assess their knowledge assets through learning and annual appraisal

Build and sustain	Collaboration is a good means to sustain knowledge, keep it in use. Does not depend on ICT.
Divest	Sabbatical leave and changing to another research institute are used as a form of knowledge divestment.

Most of the organisations have been able to incorporate *learning* into their normal work process. They all have ways of learning from experience at the completion of a research project. Even though they try as much as possible to document properly but the learning process is still affected by inadequate documentation and lack of proper succession plans. This inadequacy could probably be due to less application of information technology to support this process. They all recognise the importance of knowledge repositories through which researchers can *share and acquire* knowledge but their development in some of the organisations is being affected by lack of trust among the researchers: they believed that their knowledge is their source of power. Sparing time to *contribute* to the repositories is another main constrain.

These organisations periodically *assess* their knowledge-based assets indirectly through comprehensive annual appraisal which covers training needs assessment and the skills acquired over a period. The knowledge assets of the organisations *are built and sustained* through collaboration with other researchers and institutions. Staff movement to similar research organisations is a normal practice through which researchers sustain their knowledge. It also serves as a form of *divestment* with the hope of gaining more benefit in the future.

ENABLERS WITHIN THE ORGANIZATIONS

Information and communication technologies

Information and communication technologies are one set of major forces that has moved KM front and center (Bukowitz and Williams 1999). These technologies have made it possible for people to share enormous

amount of information unconstrained by the boundaries of geography and time. These technologies are changing the economics of information and knowledge by reducing the scope of the trade-off between richness or depth of knowledge and reach or the extent to which knowledge can be diffused by creating an enabling environment (Evans and Wurster 2000; Broadbent et al. 1999).

All the organisations (see Table 4 for summary) are trying to improve their communication capabilities by using *information technology*. In principle, they all have Internet connectivity and access to some of the applications related to it. Apart from this general trend, most other technologies that could support KM such as intranet, data warehousing, etc., were not found in most of the organisations.

Table 4. Summary of information technology availability and management in the six organisations

MRC	Well developed IT unit Expatriate managed Problem with awareness, support, training, and utilization Full Internet connectivity Problem with technical support Intranet and groupware
NARI	Low funding and resources IT unit with few staff Lack of required resources and IS Dial-up Internet connection
ITC	Completely outsourced.
IITA	Well developed IT unit High investment on ITI Independent of national IT infrastructure Intranet and groupware
NISER	IT Unit Low funding for IT infrastructure Dial-up access to Internet
NIMR	IT Unit Obsolete Equipment Dial-up access to Internet

Leadership

The *leadership* of the organisations (see Table 5 for summary) encourage communication and collaboration. They recognise and reward good idea and innovation. They put high emphasis on training and learning and they have performance-based promotion systems. Some of the organisations have good induction or orientation programmes for new staff. The researchers are expected to give a long notification period when leaving the organisation and maintain future contact and collaboration. Face-to-face periodic regular meetings are used for deliberation, planning and decision-making.

Only one of the organisations has a KM initiative. Most of the others have, however, separate strategies to improve communication and learning, which have been found to facilitate KM. They use seminars and workshops for learning and for knowledge sharing. They all use various forms of training (on-the-job, online, distance training) to develop the skills and expertise of researchers.

Table 5. Summary of the organisational strategies and leadership approach

MRC	Linking knowledge processes with organizational objectives. Training and staff development. Multidisciplinary research. Reward for knowledge contribution and utilization. Workshop and seminars. Long period of notification to allow documentation
NARI	Regular face-to-face meetings. Seminars and workshops. Training. Emphasis on individual responsibility in a team.
ITC	Collaboration. Decentralized approach to documentation Seminars and training. Less focus on technology
IITA	Well-defined KM strategy – getting knowledge at cost-effective price. Leveraging group knowledge base. Close ties with NARS for knowledge generation and transfer.
NISER	Innovation through individual project. Seminar and workshops. Publication and research coordination unit as organization memory.
NIMR	Outcome-based promotion. Retention of employee.

Organisational culture and structures

The organisational *culture and structures* of the organisations (see Table 6 for summary) provide a good ground for KM. Most of the research programmes in all the organisations are multidisciplinary and interdisciplinary in nature, making everybody useful and important to each other and hence enable knowledge sharing. There are forums for informal networking of the experts.

In our case organisations, there was support for individual researchers to collaborate with others both internally and externally, in order to achieve the set objectives. Thus they were able to link sharing of knowledge to solving practical problems (McDermott and O' Dell, 2001) and to driving the innovation process (Leonard and Sensipar, 1998).

There is existence of the kind of communication, collaboration and interaction that is essential in sharing both tacit and explicit knowledge and support for transforming this knowledge from individual to organisational level (Gold et al., 2001). The issues of trust and how to reward knowledge sharing are among the concerns expressed in the organisation. Since knowledge can only be volunteered (Snowden, 2000), there is need for trust and openness to support KM.

All the organisations are structured in what could be described as center organisation (Cusumano and Nobeoka, 1998), which facilitates knowledge retention and transfer mechanism. In all the organisations, there are functional managers available to all the projects and programmes and each these has a leader. The project and programme arrangement provides enough flexibility to make quick and efficient decisions without the problems of a

hierarchical organisation. They all operate in a collegiate ways and they use multidisciplinary project arrangements to encourage cooperation among the researchers.

Table 6. Summary of the structure and culture in the six organisations

MRC	Non-hierarchical project structure. Open and knowledge sharing attitude Collaboration
NARI	People oriented culture
ITC	Open communication.
IITA	Collegiate environment Open communication. Staff orientation program.
NISER	Teamwork approach to problem solving. Individual project initiative
NIMR	Team oriented

THE LOCAL FACTORS

The organisations also portrayed specific local factors in both the KM processes and their enablers. The factors here include local orientations and beliefs, persistent under-funding and operating environmental influences.

Local culture and beliefs

There is a high tendency that the traditional culture and beliefs of the society filter into the organisational culture. These can have a great influence on KM. Differences in cultural beliefs between countries (Nidumolu and Goodman, 1996; Straub, Loch, and Hill, 2001) are well known in information system development and implementation. We found these to have influence on KM, as well. For example, while training and learning without any formal certification could be acceptable for employees in Western industrialised countries, we found that employees in sub-Saharan Africa would normally like to have a certificate for their training. Thus some forms of training would have to follow different formats.

“.....I think the financial incentive has mainly attracted people initially to do the on-the- job training (OJT) and it is also slightly more popular. But some of the main problems of OJT are still

there. In the culture here, and I think in Africa in general, people don't see the same value in training unless there is a certificate or qualification attached to it. So that's one big part. Having a qualification attached to OJT is a big issue in giving OJT the credibility that it needs.”(SA, MRC)

Knowledge as a source of power has a different meaning to western employees and their developing countries counterparts (see also Malling, 2000). Due to the high unemployment rate, the lack of social security and benefits, and with only few highly paid jobs, everyone likes to protect their source of competitiveness and thus they could view sharing knowledge differently.

“.....When I came in, I worked alone on my programme. You are not rewarded for sharing what you are doing, maybe the only reward is to make yourself replaceable, I mean..... yeah, that is the only reward.”(AA, MRC)

These above issues are clearly behavioural and cultural, yet they can affect the way people react to the use of technology. Obviously contributing to knowledge sources would not be the same with people that have different views of information and knowledge.

There are also different views of “being respectful” between different cultures. For example, in some African societies it will take a lot of diplomacy for a younger person to express contrary radical opinions in the presence of the elders. This could manifest itself in organisations where the opinions of the senior and elderly colleagues are treated with the maximum respect and accepted in most cases. This is similar to the concept of “kreng jai” in Thailand that makes a subordinate to pay respect to the superiors with the assumption that they are higher in terms of knowledge (Rohitratana 2000). In these situations, knowledge is closely associated with the knower. An attempt to overlook these seemingly minor issues, which are specific to the local orientation, could have an adverse impact on the process of managing

knowledge. This could lead to an uncritical implementation of the current models and frameworks without any contextual consideration required by the local orientation and beliefs.

Persistent under-funding

We found that level of funding is essential for the long-term strategy of these organisations. The international organisations with better funding seem to be able to develop longer-term strategies compared to the national organisations. The effect of this on the KM efforts of the organisation is in the ability or inability to support various KM initiatives and in the possibility to acquire the right kind of technology that could improve the process of managing knowledge. For example, IITA has been able to acquire its own infrastructure, bypassing the national infrastructures on electricity and telecommunications. It is also the only organisation with a defined KM strategy, due to their membership of Consultative Group on International Agricultural Research (CGIAR).

During the interviews with the scientists in all national organisations in both countries, they expressed the problem of low funding and how it was affecting their efforts in getting the required knowledge to do their work and hence their productivity. Apart from having to spend their own resources to acquire the technology required for their job, the low funding does not allow the organisation to invest in the right kind of IT infrastructure, which they all agree could facilitate their communication and knowledge sharing. Low funding affects stocking of the library and using appropriate technology to manage the small stock and to be responsive to the needs of the researchers. Most of the interviewees shared the opinion on this issue.

“The researchers are willing to learn but it is a situation where resources are not available. Research cannot be carried out without money. It is a money-gulping thing, it takes a lot of money and you don’t expect immediate results, particularly not in medical research. It is not something like industrial research where you have a very big

breakthrough and you publicise that you have been able to invent these things. I think medical research is not like that. I think the past government was not too keen on that. They didn't make money available for our researchers to work with. They keep on searching for funding, except some of them that are ready to spend their own money. Somebody was just telling me that she needed a reagent for her research work, she had to take a cooperative loan to get it, the loan is not meant for that kind of thing, but she had no alternative for her research work, so that is a kind of problem we have. Maybe with this present government, things may improve.” (SA, NIMR))

Operating environment

While most of the enablers are internal to each organisation, we found some factors that are external and common to all the organisations we studied. The extent of these also varies from country to country and between organisations. Holsapple and Joshi (2000) refer to these as the GEPSE (governmental, economic, political, social, and educational) factors. We found information technology infrastructure, that has little emphasis in efforts of manage knowledge globally, to be very important locally in these organisations. Apart from the problems of infrastructures like telecommunications, electricity and how they affect information and communication technology that could support KM within the organisations, lack of required expertise to manage the equipment is also an obstacle.

“.....You see in a more industrialised country, where there is a reliable infrastructure system, it makes research convenient. But in a developing nation like Nigeria where infrastructure is still at the lowest end of development, it creates a lot of obstruction. You cannot collect information through email. Even when you telephone to discuss with your source of information, you are not through maybe because of inadequate electricity supply. Most of these infrastructure lapses are obstructing the effectiveness of the flow of information. You cannot rely on these gadgets. Suppose you are here now, you want certain information, there is no electricity supply, how do I open my computer to let you have access to information that is one hindrance. Suppose I want to telephone, the telephone is dead. Even if you write, the postal system is very deficient, what it is supposed to take a day can take a week..... So you see the lapses. The point I am driving at is that infrastructure underdevelopment is causing a lot of obstructions, a lot of obstructions particularly in the flow of information. If government

can do a lot of things to improve the infrastructure sub-sector, they will be doing a lot of things to allow information to flow and the number of research programmes will increase, the research technology will be better managed.....”(AA, NISER)

Most of the problems associated with these environmental factors are beyond the control of organisations and they pose constraints on the efforts to manage knowledge. Underestimating the magnitude of these threats could hinder organisations to realise the full benefit of KM.

CONCLUSIONS

While there are some similarities in the organisational culture of the organisations in developing countries and those in the West and Japan, the influence of the national culture still presents some differences. Like in earlier frameworks (see Holsapple and Joshi, 1999 and Lai and Chu, 2000 for reviews), we also found that organisational structure, leadership, and management also play significant roles in the KM efforts of also these organisations. However, our findings reveal some distinctive issues that require local consideration. Some of the problems encountered by these organisations, such as managerial issues, dependency on key personnel, and tight schedules are common in KM efforts globally (Davenport et al., 1998; Brown and Woodland, 1999; Storey and Barnett 2000; McDermott and O’Dell 2001). However, they also raise specific issues in the African context, such as short-term planning due to the project culture, persistent under-funding, long delays in communication, or vulnerability at the face of equipment problems, which is closely dependent on the operating environment. For organisations thinking of implementing KM in developing countries, our findings suggests due consideration for the influences of operating environmental factors, national culture and beliefs, and local orientation on the KM enablers. With the diversity of people and countries in developing countries, provision should be made for varying the context and meaning of knowledge in each

circumstance. Where individual knowledge is perceived as means of livelihood and power, managing knowledge might be difficult.

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