Knowledge Management Enhancement through ICT

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Abstract

We live in a knowledge society where economies are knowledge-based. Knowledge assets have become the intelligence behind individual and organizational success. Knowledge plays a role in contributing to the economic development of developing countries including Kenya through job creation, reduction of operational costs, improvement in revenue collection and improved operational performance in organizations. These knowledge assets come in many forms of content including text, graphics, sound and video and as tacit knowledge embedded in human minds which is known as human and structural capital. Knowledge therefore is an important competitive asset in these competitive economies; however it faces challenges that include lack of familiarity and access to new and changing technology. The overall purpose of this paper is to report on the information communication technologies (ICTs) and their impact on managing knowledge. It explains the use of (ICTs) as an enabler for managing knowledge (tacit and explicit) in the knowledge society. Technology should be seen as an enabler of Knowledge Management. ICT tools are used to capture, codify, store and distribute knowledge throughout the organization. ICT tools such as Internet, Intranet, Extranet, Email, Electronic Data Management Systems (EDMS), Decision Support Systems, Expert Systems, Groupware, Wikis, Weblogs, and other shared networked and net-based technologies are used to leverage Knowledge Management processes in the organization. ICTs provide members in an organization with a platform to communicate and to get access to the right information at the right time for the right purpose. Therefore, there should be a balance between knowledge management initiatives and engagement of ICT tools and infrastructure in order to exploit the benefits of Knowledge Management to the fullest.

In the creation, sharing and usage of knowledge, organizations depend on the availability of people who can manipulate various knowledge assets and leverage them across the organization using appropriate technologies and channels to enhance knowledge.
Keywords: Knowledge, knowledge management and Information Communication Technology

Introduction
ICT (information and communications technology - or technologies) is an umbrella term that includes any communication device or application, encompassing: radio, television, cellular phones, computer and network hardware and software, satellite systems and so on, as well as the various services and applications associated with them, such as videoconferencing and distance learning. ICT covers any product that will store, retrieve, manipulate, transmit or receive information electronically in a digital form. For example, personal computers, digital television, email, robots. Therefore ICT is concerned with the storage, retrieval, manipulation, transmission or receipt of digital data ICTs are often spoken of in a particular context, such as ICTs in education, health care, or libraries. ICT has been the driver of innovation importantly, it is also concerned with the way these different uses can work with each other share their experiences and knowledge.

With regard to knowledge management it is important to consider the following topics that deal with the way ICT is used and managed in an organization:

- The nature of information; this covers topics such as the meaning and value of information; how information is controlled; the limitations of ICT; legal considerations
- Management of information - This covers how data is captured, verified and stored for effective use; the manipulation, processing and distribution of information; keeping information secure; designing networks to share information
- Information systems strategy - this considers how ICT can be used within an organization as part of achieving goals and objectives

As we have all witnessed, the advent of the ICT tools such as internet, broadband communication, open source collaboration, and the rapidly improving computing capacity has changed the world economy drastically. The knowledge economy and the globally integrated enterprise have become a reality. The competitive playing field between industrialized and emerging markets is leveling. The economies of industrialized countries are moving into services. Knowledge and ICTs play a major role in research and innovation

Management thrives on the ability to create and innovate new knowledge; research is needed to use existing knowledge and to create new knowledge. It is the means for maintaining intellectual leadership.

Knowledge management is the solution for sustaining a competitive edge in a knowledge economy.

ICTs act as the means for knowledge management, ICT has been the driver of innovation. Innovation is defined as the application of knowledge to societal and organizational challenges to come up with solutions to the challenges. Innovation can target the challenges an organization or society faces. For example, ICT can
create value by contributing to innovation in customer intimacy and product leadership by doing customer profiling, based on customer data while respecting people’s privacy. Then by using advanced technology in data mining, data warehousing, and customer relationship management software we generate accurate profiles of customers to provide tailored products and services that meet their needs and wants. This would hence help in the optimized mass customization to increase market share, thus improving operations and obtaining a competitive edge.

**Knowledge management**

**Knowledge:**

Knowledge is closely linked to doing and implies know-how and understanding. The knowledge possessed by each individual is a product of his experience, and encompasses the norms by which he evaluates new inputs from his surroundings (Davenport & Prusak 2000). The definition presented by Gamble and Blackwell (2001), based closely on a previous definition by Davenport & Prusak:

"Knowledge is a fluid mix of framed experience, values, contextual information, expert insight, and grounded intuition that provides an environment and framework for evaluating and incorporating new experiences and information. It originates and is applied in the mind of the knowers. In organizations it often becomes embedded not only in documents or repositories, but also in organizational routines, practices and norms."

**Types of Knowledge**

**Explicit Knowledge**

This type of knowledge is formalized and codified, and is sometimes referred to as know-what (Brown & Duguid 1998). It is therefore fairly easy to identify, store, and retrieve (Wellman 2009). This is the type of knowledge most easily handled by KMS, which are very effective at facilitating the storage, retrieval, and modification of documents and texts.

From a managerial perspective, the greatest challenge with explicit knowledge is similar to information. It involves ensuring that people have access to what they need; that important knowledge is stored; and that the knowledge is reviewed, updated, or discarded.

Many theoreticians regard explicit knowledge as being less important (e.g. Brown & Duguid 1991, Cook & Brown 1999, Bukowitz & Williams 1999, etc.). It is considered simpler in nature and cannot contain the rich experience based know-how that can generate lasting competitive advantage.

Although this is changing to some limited degree, KM initiatives driven by technology have often had the flaw of focusing almost exclusively on this type of knowledge. As discussed previously, in fields such as IT there is often lack of a more sophisticated definition. This has therefore created many products labeled as KM systems, which in actual fact are/were nothing more than information and explicit knowledge management software. Explicit knowledge is found in: databases, memos, notes, documents, etc. (Botha et al. 2008)
Tacit Knowledge (Embodied Knowledge)
This type of knowledge was originally defined by Polanyi in 1966. It is sometimes referred to as know-how (Brown & Duguid 1998) and refers to intuitive, hard to define knowledge that is largely experience based. Because of this, tacit knowledge is often context dependent and personal in nature. It is hard to communicate and deeply rooted in action, commitment, and involvement (Nonaka 1994).

Tacit knowledge is also regarded as being the most valuable source of knowledge, and the most likely to lead to breakthroughs in the organization (Wellman 2009). Gamble & Blackwell (2001) link the lack of focus on tacit knowledge directly to the reduced capability for innovation and sustained competitiveness.

KMS have a very hard time handling this type of knowledge. An IT system relies on codification, which is something that is difficult/impossible for the tacit knowledge holder.

Using a reference by Polanyi (1966), imagine trying to write an article that would accurately convey how one reads facial expressions. It should be quite apparent that it would be near impossible to convey our intuitive understanding gathered from years of experience and practice. Virtually all practitioners rely on this type of knowledge. An IT specialist for example will troubleshoot a problem based on his experience and intuition. It would be very difficult for him to codify his knowledge into a document that could convey his know-how to a beginner. This is one reason why experience in a particular field is so highly regarded in the job market.

The exact extent to which ICT systems can aid in the transfer and enhancement of tacit knowledge is a rather complicated discussion. Successful KM initiatives must be very strongly emphasized on the tacit dimension, focusing primarily on the people involved, and they must understand the limitations imposed by computerized systems.

Tacit knowledge is found in: the minds of human stakeholders. It includes cultural beliefs, values, attitudes, mental models, etc. as well as skills, capabilities and expertise.

Embedded Knowledge
Embedded knowledge refers to the knowledge that is locked in processes, products, culture, routines, artifacts, or structures (Horvath 2000, Gamble & Blackwell 2001). Knowledge is embedded either formally, through a management initiative to formalize a certain beneficial routine, or informally as the organization uses and applies the other two knowledge types.

The challenges in managing embedded knowledge vary considerably and will often differ from embodied tacit knowledge. Culture and routines can be both difficult to understand and hard to change. Formalized routines on the other hand may be easier to implement and management can actively try to embed the fruits of lessons learned directly into procedures, routines, and products.

ICT’s role in this context is somewhat limited but it has some useful applications. Broadly speaking, IT can be used to help map organizational knowledge areas; as a tool in reverse engineering of products (thus trying to uncover hidden embedded knowledge); or as a supporting mechanism for processes and cultures. However, it has also been argued that IT can have a disruptive influence on culture and processes,
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particular
ly if implemented improperly.

Due to the difficulty in effectively managing embedded knowledge, firms that succeed may enjoy a significant competitive advantage.

Embedded knowledge is found in: rules, processes, manuals, organizational culture, codes of conduct, ethics, products, etc. It is important to note, that while embedded knowledge can exist in explicit sources

(i.e. a rule can be written in a manual), the knowledge itself is not explicit, i.e. it is not

Knowledge Management

KM is about making the right knowledge available to the right people. It is about making sure that an organization can learn, and that it will be able to retrieve and use its knowledge assets in current applications as they are needed. In the words of Peter Drucker it is "the coordination and exploitation of organizational knowledge resources, in order to create benefit and competitive advantage" (Drucker 1999).

Knowledge Management Definition

Knowledge management consists of the initiatives and systems that sustain and support the storage, dissemination, assessment, application, refinement, and creation of relevant knowledge.

Knowledge Management involves:

Knowledge acquisition which refers to the knowledge that a firm can try to obtain from external sources. Knowledge creation according to the Nonaka's SECI model is about continuous transfer, combination, and conversion of the different types of knowledge, as users practice, interact, and learn. Knowledge sharing is an activity through which knowledge (i.e. information, skills, or expertise) is exchanged among people, friends, or members of a family, a community (e.g. Wikipedia) or an organization.

Knowledge Transfer/sharing and ICTs

ICTs impact upon knowledge in a variety of ways. Firstly, the proliferation of cheap decentralized computational power that allows for the collection, collation, storage and dissemination of data on a scale not practicable in the past. This gives rise to new information and from this new knowledge. Secondly, ICTs facilitate knowledge transfer through the exchange of data. However, as Bolisani and Scars argues that, this requires a double transformation process from knowledge to information and then to data, and back from data to information and, finally, to (fresh) knowledge. Where knowledge can be codified, with the use of ICTs, be distributed worldwide with the touch of a button at little cost.

The transfer of tacit knowledge, however, cannot be executed in such a simple fashion, since the transformation from knowledge to information and on to data will be incomplete. Consequently, the transfer of tacit knowledge often requires proximity between the transmitter and receiver. Videoconferencing and virtual project rooms may aid the transfer of tacit knowledge. Nevertheless, such technologically facilitated
communication cannot at present replace the direct face-to-face contact that is often a prerequisite for the successful transfer of tacit knowledge.

In addition, the establishment of a level of trust required to facilitate the exchange of knowledge also favours co-presence and co-location. ICTs increase the sharing of information and information about sources of knowledge, as well as knowledge about sources of information. However, ICTs alone fail to capture fully the conditions required for the successful sharing of tacit knowledge.

Two individuals on different sides of the world can read the same codified knowledge embedded in a document delivered to them simultaneously through e-mail.

However, these individuals cannot share tacit knowledge actively, even with the help of desktop videoconferencing, unless they share a common social and cultural context. If this condition is fulfilled they may share tacit knowledge by assimilating codified knowledge and thereby creating new tacit knowledge that will be largely, though not completely, the same. Indeed, if the view of knowledge as fundamentally centred on the individual is accepted, it is questionable whether individuals can share their tacit knowledge base in its entirety with other individuals. The most that can be achieved is a high degree of overlap between the tacit knowledge held by individuals working together within a group.

Reasons for using ICT in Knowledge Management

To help people create knowledge act as mechanisms; ICT is a mechanism to create knowledge. Nonaka and Takeuchi (1995) suggest four types of knowledge management interactions that are necessary for effective knowledge creation. These are:

- Tacit to tacit knowledge via socialization, Individuals have a wealth of tacit knowledge to share with colleagues. IT is the most convenient, cheapest and fastest mode of doing so. For instance, face-to-face exchange of knowledge via teleconferencing technologies, including desktop videoconferencing.

- Tacit to explicit knowledge via externalization, Explicit knowledge is stored on paper, audio or video or videotape, computer disks, etc. Its creation has been greatly enabled by IT. For instance, electronic mail (email) to exchange information.

- Explicit to explicit knowledge via combination, In addition to e-mail, organizations have invested in new web-based software and servers to facilitate explicit knowledge sharing. In addition to web sites big companies also use intranet home pages for publishing applications to exploit the hypertext linking and search capabilities of these web technologies.

- Explicit to tacit knowledge via internationalization, It depends on an individual's ability, expertise, and experience to make sense out of explicit information. Computer applications can help people recognize patterns or anomalies. For example, data mining tools based on neural networks, simulation modeling and applications based on visualization technologies such as geographic information systems are increasingly being used by decision makers for sense-making in the presence of complex sets of data.

The information sources used by the decision makers; many information system
organizations have invested in the creation of large stores of data (data marts or warehouses) in order to support the information needs of decision makers. ICT facilitates this by providing large storage capacity devices which are more reliable.

Sense-making activities to support innovation most of ICT capabilities facilitate sense making in the presence of highly complete information and less complete information. For instance, simulation tools and pattern-matching applications based on neural networks can be used for the modeling and identification of patterns not apparent to the knowledge worker alone. Here, ICT can be used as a tool to support sense making by the decision makers.

Web-based technologies are popular for several reasons; they are convenient to use, easy to develop and maintain and provide one of the quickest and most far-reaching means of conveying information. “The key issue is not about the latest information technologies, but whether those technologies are used within, and for facilitating, a culture of information sharing, relationship building and trust” (Malhotra, 1999). In other words, it is not what you have but how you use it and that depends on humans.

Junnarkar and Brown (1997, p. 147) suggest four points to be considered to see ICT as a key enabler in knowledge management:

- Develop enterprise wide IT standards for an IT infrastructure in order to link people to people and people to information;
- Link IT investments in the firm's overall knowledge management strategy;
- Knowledge managers need to be proactive in implementing IT tools to access explicit knowledge; and
- Establish knowledge management partnerships that bridge information systems and human resources.

A good ICT infrastructure is not a sufficient condition for the success of KM but a necessary condition for it. ICT per se cannot change, but only reinforce norms and folkways about sharing information or insights and using other's ideas in an organization”. It is important to have an adequate and efficient system, but this system must be geared towards a long-term fulfillment of objectives as well as immediate goals, otherwise the organisation may succeed initially but will ultimately suffer. It cannot be ignored that the human aspect of KM is the most important-it is here that knowledge arises, technology simply makes it easier to catalogue and convey this knowledge. Without individual participation, even the latest technology will be redundant.

Rutherford (2001) further adds to the above: “Buying a typewriter does not make one a better writer. Similarly, just buying new information technologies do not make an organization better at managing knowledge. What is critical is acceptance and effective utilization of the technologies.” It should be remembered that ICT infrastructure is valuable for knowledge management, but ICT alone cannot bring about a revolution in African development without the necessary expertise.

Used in managing indigenous knowledge, ICT is being used all over the world to store, manage, retrieve, disseminate and preserve indigenous knowledge. It is astounding to see how the basic ICT tools like the tape recorder can make the transfer
of IK possible. For instance, to promote sustainable management of agroecosystems Kenya initiated an IK journal to document and use indigenous/traditional knowledge. For this journal farmers record their knowledge on a specific topic on an audio tape or any other media in their own language. This can then be listed in a scientific journal. Information given in such papers are deemed to be the interpretations of the tapes content.

A good example of Community Documentation of indigenous knowledge is the Kyanika Adult Women Group (KAWG), who had started a two-year project to conserve and share the diversity of Kitete, a bottle gourd that is found in virtually every aspect of the Kamba people's traditional and cultural life, and its associated IK was launched in March 2001. KAWG identified and invited community resource persons to train women at a six-day seminar and women further trained community groups to conduct the project in their own areas. The documented information and techniques are being used nationally and internationally in workshops and other presentations. Recorded materials, documents, and a collection of Kitete, samples and seeds can be accessed by the local community and others. Other activities are story telling by elders; sharing myths, songs, dances, riddles, poems, and drama; listening to taped material; looking at photographs; watching videos; and reading written reports (in the local kikamba language); and displaying materials at seed/fruit fairs and IK competitions. Groups have also come up with in come generating activities such as selling decorated or carved Kitetes, making and selling Kitete ornaments, and selling rare and popular types of seeds and fruits to the visitors. This all is possible by using modern ICT, which enables he saving, documenting and improving upon traditional knowledge of plants and their uses.

Information and communication technology (ICT) can enhance knowledge sharing by lowering temporal and spatial barriers between knowledge workers, and improving access to information about knowledge.

Knowledge sharing is related to communication. It is also different from but related to information distribution. ICT may help locate the various elements relevant to the process of knowledge sharing ICT may be introduced with the purpose of improving the processes involved in knowledge sharing.

ICT here also facilitates sharing of knowledge and information over wide geographical area.

Information communication technology if well implemented and people are trained and educated in its use can help in faster and effective access of information and knowledge which can also be posted on the system for access by others in the organization either on their desk or on the other side of the world. But more than just this, groupware technology such as Lotus Notes and Domino working over the internet, your organizational intranet or extranet allows you to work collaboratively with anyone anywhere in the world to achieve your objectives.

ICT facilitates the locating of sources of knowledge for example source of tacit knowledge through systems like yellow pages, that is, it is an expert finder.

Content creation tools like authoring systems and annotation facilities help with creating and integrating knowledge, as do automated approaches to document enrichment and expertise profiling. Organizing knowledge benefits from specialized
applications handling structures like thesauri and classification schemes. All these tool not only help with creating content but also maintaining it. Content management systems, including both document management and web content management, excel at integrating documented knowledge. Metadata and classification capabilities help organizing knowledge, versioning and link management while maintaining with it.

Advancement of ICT through the artificial intelligence provides methods for automatically segmenting and classifying content, aiding the organization of knowledge. Expert systems and intelligent agents also support knowledge integration and transfer. Network technologies rarely are at the forefront of any knowledge management initiative. Nevertheless, they provide necessary infrastructure and particularly important with regard to knowledge transfer. A standard for file exchange formats, metadata and content syndication are important for knowledge integration, knowledge transfer and knowledge management.

ICT helps in providing security to information. Security is a key concern, and a firm must protect its crucial knowledge and information resources. This can be done using firewalls, use of encryption, and simple or strong authentication. Simple authentication involves usernames and passwords, while strong authentication makes use of digital certificates.

ICT can be used to capture knowledge, categorize, search, subscribe relevant content or information and present it in more meaningful formats across multiple contexts of use. It can be used to convert tacit knowledge into an explicit form.

**Knowledge management technologies**

Knowledge Management technologies support strategies, processes, methods and techniques to create, disseminate, share and apply the best knowledge, anytime and anyplace, across the organization and across several organizations, especially its clients, customers and stakeholders.

The key technologies are communication and collaboration technologies that bring together people and knowledge they are mostly web based for internet and intranet usage, as well as mobile technologies such as PDA’s, tablets, pads’, mobile phones and videoconferencing. New technologies are rapidly emerging that act as intelligent agents and assistants to search, summarize, conceptualize and recognize patterns of information and knowledge.

**Intranets**

An intranet is collection of private computer networks within an organization. An intranet uses network technologies as a tool to facilitate communication between people or work groups to improve the data sharing capability and overall knowledge base of an organization's employees. An intranet relates to learning organizations in the following way. The intranet is not only a powerful communication medium but also a knowledge base. It has advantages over previous digital knowledge bases in that it more easily captures and handles unstructured and implicit knowledge (in contrast, DBMSs require very structured schemas to be effective). An intranet can play a valuable role in supporting and establishing knowledge management activities this is through collaborative communities such as communities of practice.
Communities of practice and intranets
The approach ‘communities of practice’ was developed by Etienne Wenger to explicitly recognize the importance of the less-formal knowledge sharing that occurs between peers, and within small groups. This has grown to be of major interest within the knowledge management community, and it has been used successfully within (and between) many organizations.

An intranet can play a valuable role in supporting the establishment and ongoing activities of a community of practice, including:

- Building a ‘home page’ for the community of practice, this can be used as the basis for establishing the identity of the group, and promoting its existence throughout the organisation.
- Providing a collaborative environment that can be used by community of practice members, especially those located in other offices, cities or states.
- Offering a mechanism by which the output of the community of practice can be disseminated to the rest of the organization (a weblog can be very effective for this).

One of the key elements of a community of practice is that the group takes on the responsibility for the stewardship of the knowledge within their domain. This often involves the creation of some form of knowledge base, or content repository. Once captured, this knowledge can then be shared with other areas of the business that may face the same challenge, or stored for future use. Regardless of the tools used, the environment must be established with an understanding of the nature of the knowledge sharing, and must be driven by the needs of the community of practice itself.

Weblogs
Weblogs have exploded in popularity over the last year. At their most simple form, a weblog (also commonly known as a ‘blog’), is an online diary created by one or more writers. They typify the new class of ‘personal publishing’ tools that some see as a ‘disruptive’ threat to existing publishing tools.

A weblog provides a simple interface for writing a new entry, typically via an online form. This is published to the site, with standard page layout and formatting automatically added. What the reader sees is then an online diary, with the most recent posts first, and an archive of past writings.

There are now tens of thousands of weblogs in existence, written by a wide range of people covering every possible topic. A quick search for ‘knowledge management’ will reveal dozens of weblogs specifically addressing this subject.

From a knowledge management perspective, weblogs harness the power of conversation to convey messages in a very honest and powerful way. With weblogs being written in a first-person format, the voice of the author comes through clearly, thereby supporting the message with the reputation of the author.

As such, weblogs are increasingly being used by individuals, communities and companies to share knowledge across traditional boundaries.
K-logs
Weblogs become particularly interesting when they are used within an organisation, where they are known as ‘knowledge logs’ or ‘k-logs’. This has been an approach evangelised primarily by John Robb.

k-logs act as a way of breaking down barriers within the organisation, and facilitating a more efficient flow of information and knowledge. For example, key individuals with the knowledge and respect can use weblogs to record progress on strategic projects or issues. By building on the reputation of the writer, weblogs harness the recognised benefits of ‘storytelling’ techniques.

Weblogs can also be used by project teams to both communicate to the wider organisation, and to keep track of who is doing what within the team. In this way, the team weblog acts as a voice for the project, and an archive of past decisions.

Wikis
Wikis are a surprising new approach to publishing online information. They are essentially an ultralightweight content management system, developed primarily in the open-source world. They work as follows:

- At the bottom of each page, there is an ‘edit this page link’.
- Anyone can click on this link to bring up an editing screen, make changes, and click ‘save’.
- The page is then instantly updated with the changes.
- Creating a new page is as simple as capitalising a word in a specific way and it automatically becomes a link. Click on this link, and the user is given the option of creating a new page.

A wiki imposes no controls over who can create or edit pages. Making it very simple to update content supports the ongoing growth of content, and not imposing any restrictions encourages multiple people to add content to a single page.

It is this easy of editing and natural support for collaborative work which makes wikis an ideal tool for communities of practice, or team-level knowledge sharing. The author has used a wiki in this way to support the innovation of practices within his consulting team.

What is extremely interesting from a knowledge management perspective is the way in which wikis, due to their complete lack of control or restrictions, fundamentally rest upon the social dynamics of the communities that use them.

While any user can delete at will the work of others, this rarely happens. Instead, the use of wikis seems to encourage the free flow of information between participants and the voluntary contribution of additional knowledge.

Over time, the community using a wiki builds its own language and structure (ontology) for the domain that the site covers. This collaborative, innovative and incremental development of knowledge is a rich source of exploration for knowledge management professionals’ remarkable example of the power of wikis is the Wikipedia (www.wikipedia.org), a public site where visitors from across the globe have voluntarily contributed their knowledge to a (now substantial) free encyclopedia. A fascinating question is why this site succeeded on such a large scale when so many
other knowledge-sharing initiatives have failed.

**World Wide Web**
As the largest interconnection of computers and computer networks, the World Wide Web makes information and knowledge widely accessible.

**WEB as a platform.**
The WEB should be treated as a platform and not as a main application. Just as the telephone is regarded as a channel, while the conversation is the essence, WEB 2.0 applications should be treated as channels only. Trying to set a standard around your application and dominating the conversation, is a misplaced emphasis. Companies that understand and instill the concept of “WEB as platform”, selling the channel (services through which people purchase the content), include among others: Amazon, eBay and Napster. Netscape

Participation of users both in the WEB arena and in the KM world, content managers and content experts took a major part in writing the content, collecting it, organizing it and categorizing it. Users mainly used it. In the WEB 2.0 new world, this concept changes: the user is an active participant and gives added value to the content. There are various levels of user participation based on web 2 tools:

- **Passive users**: the history of their activity is what is collected, giving an added value. For example: Amazon recommends books based on what readers, with similar profile, have already purchased.
- **Minimal active users**: users adding content to other people’s content (i.e. Tagging) or write content themselves, but as individuals (i.e. Blogs).
- **Collaborative active users**: users that work together over the net, adding collaborative content. For examples: Wiki, Google’s spreadsheet, etc.

The service improves automatically the more it is used (by the people). As defined above, users are active, and their participation is part of the architecture in which the services are based on. Users’ participation influences the net. The service is designed so that it improves the more it is used. This principle can be understood by looking at an example of the Google Search model of ranking. The ranking is heavily influenced, by the number of accesses of all previous users to pages on the results domain of the search. The more people search, the more statistics are gathered, and the quality of this ranking will be higher. The service improves by the same principle also in eBay, Napster, Amazon and many other WEB 2.0 applications. This principle may sound new, but is not so revolutionary. The academic field has always respected researchers according to the number of papers written by them, but more than that, regarding the number of times they were cited by other researchers.

The supplemented content is a competitive advantage because content is the core. In order to give the service a competitive edge, the service will be based on content: It may be based on its own content or manage complementary content, to that which it is based on; Thus, giving the user a new added value, as result of the new data. This principle can be demonstrated by viewing the Google search model, where the added
content lies in the indexing and ranking.

**Social media**

Social media technology provides the conduit and means for people to share their knowledge, insight and experience on their terms. It also provides a way for the individual to see and evaluate that knowledge based on the judgment of others. The emergence and impact of social media in the enterprise forces us to rethink knowledge management and creates completely new challenges.

Social media takes knowledge and makes it highly interactive. It creates content as a social object. That is, content is no longer a point in time, but something that is part of a social interaction, such as a discussion. It easily disassembles the pillars of structure as it evolves. As examples: content in a micro-blogging service can shift meaning as a discussion unfolds; conversations in enterprise social networks that link people and customer data can defy categorization; and internal blogs and their comments don't lend themselves to obvious taxonomy.

Social media is often cast as being at odds with enterprise initiatives such as knowledge management. There is a sense that as people embrace and use social media tools like Twitter, Facebook, LinkedIn, the enterprise loses control over their knowledge. There have always been and always will be opportunities and reasons to search the Internet verses searching the Intranet; for participating in an Internet discussion group vs. one in your enterprise community; and for leveraging external wisdom vs. known internal resources.

Social media and knowledge management aren’t at odds at all. In fact, the most successful knowledge management systems embrace social media, but with a business mindset. The smart KM implementations leverage blogs, subscriptions, communities, discussion forums, and member profiles. They tie it together with search in a single working environment. And they look for opportunities to tie in other tools to streamline knowledge sharing — everything from instant messaging (i.e. Face book).

A few of the comments that really stuck out in our discussion today bear this out. We were asked for tips on optimizing the integration between social media applications and intranets. Here are a few notable responses:

**Mobile phones in knowledge management**

Mobile phones are increasingly being used for exchange, collection and dissemination of information and knowledge. Mobile phones through its various functionalities such as messaging services and calling service facilitate a group to share and discuss lessons learned, best practices, current challenges, innovations, news, and other information and knowledge. What took days and weeks before wireless communication, now takes minutes and hours. With the development of internet enabled mobile phone and smart phones knowledge is easily shared between people in the remotest places, this is done through sharing experiences and problems which bring up new knowledge and ideas. Mobile telephony systems provides an immediate, transparent and multi-directional way for organizations and customers to manage existing problems and also better plan for the future. It allows for the development of data direct from the source. Mobile telephony builds on successful open-source
systems and open up multi-channel communication among organizations. Mobile telephony allows sharing of information and knowledge by creating Multi-directional communication, Community-driven list of issues.

**Intelligent agents**
These are software programs or code that accepts input in the form of a user profile indicating the information that is deemed significant in a particular job or in a specific working environment and produces the information in an easy-to-understand manner. Agents are rarely stand-alone programs; rather, they are embedded in other applications programs such as e-mails, word processors, or scheduling programs (Petter, 2000). A simple example of an agent is software that allows users to develop rules for automatically handling e-mail messages, based on subject matter, source, or other characteristics.

**Groupware**
Groupware is a software that supports collaborative work and sharing of information in the pursuit of company goals and objectives. Groupware such as the popular Lotus Notes, provide tools to enhance the communication between work groups and keeps everyone up to date on what has transpired (Vail Iii, 1999).

Groupware can provide an effective means to put the action into the definition of knowledge, which is, turning information into actionable knowledge.

**Electronic networking**, in this context, the KM needs to produce information, acquisition data at the source, transmit it to the data warehouse, analyze it with data mining, and finally transmit the information to the needed entities (Vail Iii, 1999). These knowledge management processes and activities are based on electronic networking architecture, including the Internet, intranet, and extranet, etc.

**Knowledge mapping**, Vail Iii (1999) defined a knowledge map as the visual display of relationships of acquisitioned information which will provide a vehicle for the communication of knowledge in an organization. This is a collection of relevant knowledge that is continuously evolving in all its forms (text, pictures, stories, data, and models) in an organization. There are two basic types of knowledge maps, static, and dynamic (Vail Iii, 1999) that can be used for acquisition of the organizational knowledge.

**Challenges:**
- Even with the modern tools, the process of knowledge transfer is inherently difficult, since those who have knowledge may not be conscious of what they know or how significant it is, or be able or willingly to share with others. Even when they are so willing the readiness to accept the wisdom of others is often not obvious.
- There are also many systems that are neither quick, easy- to- use, problem free in operation, or easy to maintain. The web, for example, frequently creates information overload.
- Cultural change to embrace formal education to acquire knowledge-intensive skills
The constitution is not encouraging knowledge sharing because of the governments secrecy Act

Cyber crime – banking frauds, MPESA frauds, immoral behavior, hacking and hacking of websites

Knowledge is too difficult to measure. Some people believe that the benefits of knowledge simply too difficult to measure without the ability to accurately measure the benefits, there is no way to know for sure whether or not the knowledge management system is truly adding value.

Conclusion and Recommendation

For an organization to stand at a position of gaining a competitive advantage, it has got a mandate to manage its information and knowledge. This can be achieved through the establishment of Information communication technology. While knowledge management must focus on supporting the sharing of knowledge between individuals, this cannot be done in isolation. Instead, knowledge management projects must recognize the importance of providing effective platforms for this dissemination of knowledge. A range of valuable technologies can be used to directly support KM goals, including: collaborative environments, weblogs and wikis, web 2.0 in many ways, the evolution of these tools is keeping pace with, or outstripping, the pace of innovation in the knowledge management field as a whole. These points to a future where a seamless knowledge management environment encompassing both the physical and online worlds will start to be a practical reality. ICT tools have a great potential in information and knowledge sharing and collaboration, although there is an immense challenge to use them in a meaningful and coherent way. It is also important to use technology that is economically feasible, in tune of information and knowledge management and that always priorities the ideas, hopes and motives of organizations in their context.

References


[7] Enterprise Information Management Vol. 7 Iss: 5, pp.30 - 35


