Knowledge Management and Information Technology: Enablers of E-Commerce Development

Muhammed A. Badamas
Morgan State University

Follow this and additional works at: https://scholarworks.lib.csusb.edu/ciima

Recommended Citation

This Article is brought to you for free and open access by CSUSB ScholarWorks. It has been accepted for inclusion in Communications of the IIMA by an authorized editor of CSUSB ScholarWorks. For more information, please contact scholarworks@csusb.edu.
Knowledge Management and Information Technology: Enablers of E-Commerce Development

Muhammed A. Badamas
Morgan State University
USA
Muhammed.Badamas@morgan.edu

ABSTRACT

Information and Communication Technologies provide the platform for development across economic and other sectors. Knowledge and information are interconnected. The effective use of information and knowledge, however, depend on the availability of an efficient information technology. This in turn will accelerate the establishment of e-commerce in developing economies. This paper examines the relationship between knowledge, information, information technology and how they can be enablers for the development of e-commerce in Africa.

INTRODUCTION

The economic development of African nations can be accelerated by improvements in Information and Communication Technologies (ICTs) infrastructure. The explosion in technology which ushered in the information age is the basis for defining power in the modern world. African countries economies can only thrive with an integral information technology and telecommunications infrastructure. Information and Communication Technologies provide the platform for development across economic and other sectors. ICT is not only an enabler of broad based social and economic development of education, health and governance, but also key enabler of sustainable human development in a more general sense.

Information and Communication Technology (ICT) represent an opportunity to address the challenges of development to reduce poverty, especially, by a combination of wealth and job creation, and building capacity within government and community organizations. In order for local needs to be effectively expressed and managed, the skills and capacities of both individuals and institutions need to be developed to build on the potential benefits of improved information and knowledge transfer. When information is shared, it multiplies. This multiplication poses serious management challenges (Ballantyne, Labelle, & Rudgard, 2000).

Knowledge and information are interconnected. This form the basis of the work of the Global Knowledge Partnership which “is rooted in the conviction that access to, and effective use of, knowledge and information are increasingly important factors in sustainable economic and social development for individuals, communities and nations; that the information revolution can be a positive force for empowering the world's poor; that effective action to assure the inclusion of the poorest individuals, communities and nations in the global information economy requires increased partnership and mutual learning among public, private and not-for-profit organizations” (Simmons, 2000). The effective use of information and knowledge, however, depend on the availability of an efficient information technology. This in turn accelerated the establishment of e-commerce in developing economies. This paper examines the relationship
between knowledge, information, information technology and how they accelerate the development of e-commerce in developing economies, especially in Africa.

LITERATURE REVIEW

Knowledge and knowledge management are complex and multi-faceted concepts. Alavi and Leidner (2001) provides a review and interpretation of knowledge management literatures in different fields, presenting a detailed process view of organizational knowledge management with a focus on the potential role of information technology in this process. Knowledge management is the process of creating, capturing and using knowledge to enhance organizational performance (Bassie, 1997). It involves the management of the information, knowledge and experience available to an organization – its creation, capture, storage, availability and utilization – in order that organizational activities built on what is already known (Mayo, 1998). On the national level, knowledge management is the process of capturing a nation’s collective expertise wherever it resides, and distributing it to wherever it can help produce the biggest benefits. Knowledge management is concerned with the exploitation and development of the knowledge assets of a country with a view to furthering the country’s objectives (Ng & Li, 2003). The knowledge to be managed includes both explicit, documented knowledge, and tacit, subjective knowledge (Davenport & Prusak, 1998).

Knowledge is the basis for sharing business information, maintaining business relationship and conducting appropriate business transactions. E-commerce is an electronic exchange of information or digital good, services and payments (Chen, 2001). Electronic commerce (E-commerce) is sharing business information, maintaining business relationships, and conducting business transactions by means of telecommunications networks. E-commerce is conducted with the use of information technologies centering on electronic data interchange (EDI). The Internet's World Wide Web has become the prime driver of contemporary E-commerce (Zwass, 1996).

A key distinction made by the majority of knowledge practitioners is the reformation of Polany’s distinction between tacit and explicit knowledge (Nonaka & Takeuchi, 1995). Among these technologies now being applied in some knowledge management solutions are those for electronic meetings, for text-based chat, for collaboration (both synchronous and asynchronous), for amassing judgments about quality, and for so-called expertise location. These technologies are in addition to those for handling documents, such as search and classification, which are already well established yet are still developing. (Marwick, 2001).

Information technology has enormous advantages in easing the delivery of information around the world, as well as the central role of information in the new global economy. This means that information technology will shape the dynamics of the new millennium. Some authors have stressed that technology, which is a part of knowledge management, cannot make organizations more “knowledgeable” (Davenport & Prusak, 1998). Some authors suggested that an ICT-driven knowledge management approach stresses only the codifiable, explicit aspects of knowledge while ignoring the tacit aspects. Much of the knowledge management literature is biased towards a technological agenda and away from wider organizational issues, thereby ignoring social and behavioral factors (Hendriks, 2001).

The role of ICT in knowledge management causes considerable controversy (Hendriks, 2001).
Ng (2003) did a critical review of the model of Hendriks and examine its suitability for the relationship of organizational knowledge management and information and communication technology (ICT). Knowledge management is vital to a country's success in this e-commerce era because the management of citizen’s knowledge is also becoming increasingly important. There are few studies that looked at how knowledge management mechanisms were employed in e-commerce (Nah, Siau, Tian, & Ling, 2002). Nah et al., (2002) presents a comprehensive analysis of the knowledge management mechanisms employed by e-commerce sites that were rated as being the best by an independent Internet quality. But there are none that have systematically investigated knowledge management in the e-commerce context. However, leading organizations are increasingly recognizing that in order to maintain or gain competitive advantages, organizational knowledge needs to be managed for and integrated with their corporate e-commerce systems. Organizational knowledge is a pivotal corporate asset, and organizations require an infrastructure to create, structure, disseminate, and apply the knowledge to the right e-commerce applications (Bose, 2002).

Knowledge is the basis for sharing business information, maintaining business relationship and conducting appropriate business transactions. E-commerce is an electronic exchange of information or digital good, services and payments (Chen, 2001). Electronic commerce (E-commerce) is sharing business information, maintaining business relationships, and conducting business transactions by means of telecommunications networks. E-commerce is conducted with the use of information technologies centering on electronic data interchange (EDI). The Internet's World Wide Web has become the prime driver of contemporary E-commerce (Zwass, 1996).

The principal aspects of e-commerce are in five domains: commerce, collaboration, communication, connection, and computation (Zwass, 2003). These aspects of e-commerce cannot be carried out without organizational knowledge. One of the tips for successful implementation of electronic commerce is the transfer of IT knowledge (Benjaminsen, 2000). E-commerce activities have shown a steady and rapid growth. The number of Internet users at the end of 2002 was estimated at 655 million. While the rate of increase in the developed countries have slowed down, the developing countries accounted for about a third of new Internet users in 2001 (Zwass, 2003). E-commerce is a transaction involving physical or digital products that are enabled by information technology (Surjadjaj, Gosh, & Antony, 2003).

The availability of technology at reasonable price for the internet is necessary to drive the growth of ecommerce. The growth of wide and local networks has resulted in communication possibilities that were not possible a few years ago. E-commerce challenges the achievements of the IS/IT function and is very prominent in the globalization of modern organizations.

Structural conditions such as physical, social and economic arrangements shape e-commerce business models and influence individual and organizational use of the Internet. Examples include geography (which affects the physical distribution of goods purchased online), space (which influences the choice of access technology for e-commerce). In the trend of globalization, African nations have to maintain effective knowledge management with the assistance of relevant ICT so as to remain relevant and competitive. While the importance of physically transferring people is especially important for the cross-border transfer of knowledge and expertise, information technology and advanced communication systems serve as the necessary environment (Bender & Fish, 2000).
The advanced economies are considered Knowledge-based societies. The enabler of competitive advantage is knowledge. When and where knowledge is created and used in large quantities enterprises may enjoy a competitive advantage. Africa countries must have access to global knowledge for its economic development (Ondari-Okemwa, 2004).

A knowledge-based economy has a well-developed ICTs used for the transfer, processing, preserving and dissemination of knowledge and information. In order for IT to be applied, knowledge and expertise must be readily accessible, understandable and retrievable. Tobin (1996) suggests that in a knowledge-based economy, an IT knowledge network should be built with components such as knowledge depository, directory of knowledge sources, directory of learning sources and groupware.

**DATA, INFORMATION AND KNOWLEDGE MANAGEMENT**

There is a relationship between data, information and knowledge. Knowledge is the “information that is relevant, actionable, and based at least partially on experience” (Leonard & Sensiper, 1998). Knowledge provides a structure for interpreting information by assimilating and explaining variations over time and space (Gordon & Gordon, 2004). Knowledge Management provides an integrated approach to identifying, capturing, retrieving, sharing, and evaluating enterprises information assets. These information assets include databases, documents, policies, procedures, as well as the tacit knowledge and experience stored in individual's heads.

Information is intelligence or knowledge that contributes to the social, economic, cultural and political well being of society irrespective of the form it is encrypted; irrespective of the mode of dissemination and the social activity that gave rise to it and the institutions that organize and disseminate it (Montivilloff, 1990). When data is processed, we have information. Knowledge can then be considered as a mixture of useful information collected over time based on experience and understanding. Information is the result of a human’s interpretation of data. Data consists of largely arbitrary symbols. Figure 1 shows the relationship between data, information and knowledge management.

**Figure 1: The Relationship between Data, Information and Knowledge**

![Figure 1: The Relationship between Data, Information and Knowledge](chart)

There is no evidence that Knowledge Management, in all these respects, is any different from other management initiatives (Applegate, Cash, & Mills, 1988) According to Lueg (2001), knowledge is often seen as information, with specific properties, which is viewed as a kind of preliminary stage to knowledge. This relationship of information and knowledge allows the application of computer-based information management techniques, such as information retrieval and information filtering, to the management of knowledge.
INFORMATION TECHNOLOGY AND AFRICA

The role of ICT in the world order is captured vividly in the declaration of principles issued at the end of the 2003 World Summit as follows:

We declare our common desire and commitment to build a people–centered, inclusive and development-oriented Information Society, where everyone can create, access, utilize and share information and knowledge, enabling individuals, communities and peoples to achieve their full potential in promoting their sustainable development and improving their quality of life, premised on the purposes and principles of the Charter of the United Nations and respecting fully and upholding the Universal Declaration of Human Rights (WSIS, 2003).

Information technology allows effective and efficient management of information and eases communication among people and organizations. Information technology includes computer hardware, software, and database management systems and data communication technologies. Information systems are a combination of information technology, data, procedures for processing data and the people who collect and use the data. The role of information technology (IT) in sharing knowledge has been debated greatly. Many investigators insisted that knowledge management (KM) initiatives could be successful without using IT tools (McDermott et al., 2001), and IT should be adopted only when it is necessary. Others argued that IT is strategically essential for global reach when organizations are geographically distributed (Duffy, 2000).

If properly used IT can accelerate knowledge-sharing capabilities in both time and space dimensions. Locality, timing, and relevancy factors determine the expediency and the strength of IT's role in KM initiatives. On the other hand, due to the difficulty of incorporating most of human behavior aspects in technology, IT cannot fully put into operation many of KM's humanistic features.

More specifically regarding IT's role, Baker, Thorns, and Dutnell (1997) concludes that technology is the obvious solution to assist communication. Nevertheless, technology alone is not a solution as stated by Terrett (1998). The mere existence of a particular type of technology does not turn a knowledge-hoarding organization into a knowledge-sharing one. Technology and cultural change must go hand-in-hand. Knowledge is human-driven and depends heavily on human relationships and community communication and interaction. The real challenge that faces IT proponents in developing economy and their roles in KM is to revolutionize the strategic objectives to select, develop and employ the appropriate technology that better serves KM.

Cleveland (1990) described a world increasingly “people-driven” as “knowledge” becomes accessible globally. This transition is directly facilitated by IT, which also assists in overcoming the cultural and linguistic barriers. However, the degree of cultural acceptance to these technological advances varies from one organization to another and from country to country. When technology intensive cultures use technology as an effective tool for its operations, there is often no choice for a KM initiative but to use technology in that particular environment. Stankosky and Baldanza (2000) have pursued this challenging philosophy. They report that
while the most cited major barriers to KM success is “culture”; the best approach is to work with the existing culture through various strategies.

Alema (1999) stresses the importance of New Information and Communication Technologies in Africa and provides an analysis of the opportunities and challenges facing African countries in their attempt to introduce and implement policies meant to encourage the use of these technologies. In most discussions of the digital divide, the emphasis is on assisting developing nations by facilitating the flow of information resources from the developed countries to the developing. The moral questions arising from the current state of information flow can be approached from an ethical perspective based on a specific moral framework. According to Britz and Lor (2003) these moral claims are the right of freedom of access to information, the right of freedom of expression, and the right of individuals and groups to control the information they have generated; the idea of a common good imposes an obligation to share information; and justice is the main tool that can be used to regulate the flow of information. In relation to knowledge management and developing nations, the exposition of Crouch, Enache and Supanc (2002) can be is modified to provide the following observations:

- Effective knowledge management systems must have specific users who demand specific data to take decisions for which they are held accountable.
- Incentives in developing countries to use objective information tend to be weak. Knowledge management system users tend to contribute and use information when there are rewards for doing so.
- There is often an overestimation of the client demand for knowledge management systems.
- Knowledge management system design tends to be burdened by unrealistic expectations about the degree of precision “required” without taking into account precision’s high costs.
- More information is collected than what can actually be analyzed and applied toward decision-making.
- Effective systems tend to build-off of existing databases, taking advantage of current data collection routines.
- Most knowledge management interventions, such as assessment, design, implementation, tend to focus on technical solutions and tend to overlook the organizational processes and institutional incentives that drive information use.
- Large-scale knowledge management efforts require consensus. New information tends to create “losers” who may actively resist implementation.
- Knowledge management systems tend to have the greatest impact on planning and policy support.

The activities that characterize knowledge work have been termed knowledge management processes (Lai & Chu, 2000; Shin, Holden, & Schmidt, 2001). There are four KM processes as described by Shin, et al. (2001). They are:

1. Knowledge creation/acquisition. This involves knowledge addition, replacement, or correction of existing knowledge. A knowledge-creating company, consistently
creates new business knowledge, disseminates it throughout the company, and builds in the new knowledge into its products and services.

2. **Knowledge transfer/sharing.** This involves conveying and diffusing knowledge throughout an organization to leverage the ways it can be used to solve problems and strengthen performance. Communication is a crucial element of knowledge sharing.

3. **Knowledge application/utilization.** This relates to the deployment of knowledge for the benefit of the organization, enabling members to use the knowledge they possess in practice and to establish the need for more.

4. **Knowledge storage.** Knowledge storage, organization, and retrieval are the last KM process considered.

Consistent with the interest in organizational knowledge and knowledge management, researchers began promoting a class of information systems, referred to as knowledge management systems. A knowledge management system can be considered as a socio-technical system that has as its objective the management and sharing of knowledge to support achievement of organizational goals. (Ng & Li, 2003). The objective is to support creation, transfer, and application of knowledge in organizations.

Most African countries are often referred to as “information have-nots” and Africa is considered as “the “lost continent” of information technology” (Odedra, Lawrie, Rennett, & Goodman, 1993). Literature on the impact of information and communication technology (ICT) in developing countries portrays ICT as generally supportive of the development process by making information and knowledge more accessible and more directly useful in many applications. (Bhatnagar, 2000; Jimba & Atinmo, 2000) The role of ICTs is considered crucial to the provision of people's basic needs, such as healthcare, food, and shelter, both in emergency situations and in the longer term, directly in social economic terms and indirectly by enabling research activities (Averyou, 1998). The implementation of computer networks in sub-Saharan Africa has been slowed by various infrastructural issues, which also curtail the possible benefits of ICTs (Barata, Kutznev, & Wamukoya, 2001; Darley, 2001). In sub-Saharan Africa, as of 2001, there were only 16 phone lines for every 1,000 inhabitants, compared to 583 phone lines in high-income countries (ITU, 1999).

The economies of Africa countries cannot be considered knowledge-based economies because a knowledge-based economy is an economy in which the production, distribution and use of knowledge are the main drivers of growth, wealth creation, and employment across all industries. The main feature of knowledge-based societies is the extent to which knowledge is accumulated, transmitted and used far from where it is created (Steinmueller, 2002). Computers make Internet connectivity possible. There cannot be Internet connection without computer. ICT makes global knowledge accessible. It has been proved that the nature of business is influenced by the level of e-commerce (Ayo & Babajide, 2006)

**E-COMMERCE DEVELOPMENT**

Broadly defined, electronic commerce is a modern business methodology that addresses the needs of organizations, merchants and consumers to cut cost while improving the quality of goods and services and increasing the speed of service delivery (Kalakota & Whinston, 1996). It also applies to the use of computer networks to search and retrieve information in support of
human and corporate decision making. According to Awad (2000), electronic commerce can be viewed and defined in several perspectives:

- From **interface** perspective, e-commerce involves information and transaction exchanges; business-to-business (B2B), business-to-consumer (B2C), consumer to-consumer (C2C).
- From a **communications** perspective, e-commerce is the ability to deliver products, services, information payments via networks such as the Internet.
- From a **business process** perspective, e-commerce includes activities that directly support commerce by means of networked connections.
- From an **online** perspective, e-commerce is an environment that makes it possible to buy and sell products, services and information on the Internet.
- From a **structural** perspective, e-commerce involves various media, data, text, web pages, Internet telephony and Internet desktop video.

E-commerce means connecting business systems directly to critical constituencies – customers, vendors and suppliers via the Internet, Extranets and Intranets. It means using electronic information to boost performance and create value by forming new relationships between and among businesses and customers (Adekunle & Tella, 2008).

Technological advancement has resulted in evolution and innovation of many products, services and business processes. One of them is the emergence of e-commerce. The Internet has resulted in the emergence of virtual markets with four primary distinctive characteristics, which are real time, shared, open and global. The application of Internet is divided into three major activities that are publishing corporate information, conducting electronic commerce and business transformation. E-commerce today is no longer technological issue, but is also a business issue. E-commerce involves a number of forms, varying level of cost and complexity, depending on business need. E-commerce gives information to the consumers (Mohammad, 2003).

Historically, there have been a number of technologies 'enabling' or facilitating knowledge management practices in the organization, including expert systems, knowledge bases, various types of Information Management, document management systems and other IT systems supporting organizational knowledge. Web-mining which is important for E-commerce depends on knowledge management (Ting, 2008). The value of web-mining techniques can be enhanced through applying them to real environments such as e-commerce and e-services (Ting, 2008). The advent of the Internet brought with it further enabling technologies. Each enabling technology can expand the level of inquiry available to customers and citizens, while providing a platform to achieve specific goals or actions. Since its adoption by the mainstream population and business community, the Internet has led to an increase in creative collaboration, learning and research, e-commerce, and instant information

E-commerce challenges the achievements of the information technology function and are very prominent in the globalization of modern organizations. To improve organizational performance and sustain a competitive advantage many African businesses must begin to embrace e-commerce. Application of E-commerce has evolved from technology driven to more users driven. E-commerce helps to exchange information and to conduct business among enterprises and individuals. It has a great impact on the business-to-business application, when it involves a
diverse group of enterprises in the decision making process. In addition, the combination of E-commerce and corporate strategy provides significant value for any business. There are three major impacts of E-commerce in business. E-commerce improves the value of the management developments; it increases shareholders’ value and lastly, it reduces, with great success, the time-cycle of research and application (Kanungo, 2004).

The promise of B2B e-commerce had led to an explosion in the number of e-marketplaces as firms adopted a “launch and learn” strategy (Rohm, Kashyap, Brashear, & Milne, 2004). With the growing importance of B2B e-commerce worldwide, African firms cannot ignore the competitive advantages that accrue by employing the Internet into their strategies.

CONCLUSION

Darley (2003), from a commercial point of view, proposes that to enhance information and facilitate e-commerce in Africa, the national governments and policy makers of the region must address the impediments to the introduction of information technology in the region. There is the need for a comprehensive Information Technology Policy by African countries that aspire to be part of the information age to help develop e-commerce. Specifically, a typical ICT policy should address:

- **Development of ICT infrastructure**: Public-Private-Partnership, telecom infrastructure, Internet connectivity, pro-poor Internet access, ICT networks, Computers and related equipment, etc. Access to infrastructure should lead to access to relevant content and services.
- **Enabling environment**: An enabling environment is critical to provide support for ICT empowerment while eliminating constraints. Legal, institutional and regulatory framework is required to ensure fair competition; to attract investment; to develop ICT infrastructure, solutions and applications; to provide tax and other incentives for ICT industry and investors; to support transfer of technology; to meet the needs, priorities, aspirations of various stakeholders; to provide legal infrastructure for intellectual property protection, digital contracting, privacy and data protection, and cyber crime.
- **E-government**: E-governance is for transparency in governmental operations, improving the quality of government’s service delivery, improving efficiency, accountability, financial management, information management, reducing bureaucracy, and delivery of public services in healthcare, education and environment.
- **Development and growth of the ICT industry**: The policy should facilitate the development of a local ICT industry that will reduce import dependence and enhance export opportunities. The ICT industry generates employment and creates wealth through the production, manufacturing, development, delivery, and distribution of ICT products and services.
- **ICT diffusion and increased ICT literacy**: Policies will deal with ICT diffusion, and ICT literacy, and awareness of the benefits of ICT, the creation of new economic and social opportunities for poverty eradication, job creation and empowerment.
• **Role of the private sector:** Policies should address how public-private partnership initiatives can be effective. It is particularly important for these initiatives to provide, support and use the information infrastructure, to encourage the deployment and use of ICT within the economy and society.

The policy should facilitate various aspects of e-business such as e-payments, e-commerce, secure transactions and the appropriate legislation. Rapid development of business-to-consumer (B2C), business-to-business (B2B) and business-to-government (B2G) e-business should be promoted. ICTs are increasingly playing a crucial role in developing countries’ capacities to produce, to provide access and apply information. For African countries, it is important to have a coherent and systematic information strategy. This paper attempts to bring out the need for information and knowledge management. A future study is to investigate the success or otherwise of the use of information and knowledge with information technology for development in some African countries. These successes shall be measured in greater length on the contribution of knowledge and IT to the development of e-commerce in Africa.

**REFERENCES**


