

Policies for Digital Libraries and Archives in Africa: Developing Strategies for Access to Knowledge for Development

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Abstract

This paper highlights the strategic role of regional and national policies for digital libraries and archives in promoting access to knowledge for development in Africa. It views regional/national information policies as general frameworks and contexts within which policies for digital libraries and archives are situated. It, however, recognizes the need to highlight the latter as instrument for effective access to and sharing of knowledge in the contemporary world in which increasing dependence on digital technology makes effective participation of digitally deficient nations virtually impossible. The paper provides an overview of the existing provisions in terms of laws, policies, agencies, institutions, facilities and such information/information and communication technologies (ICT) infrastructures that are supposed to be the basis for developing national and regional links for resource sharing. It identifies and analyses the dilemma in achieving the set objectives of African information policies. While this dilemma rooted in the political, economic and socio-cultural factors operating at different specific levels, they combine to constitute an obstacle to national and regional coordination and cooperation. Without coordination, effective resource sharing at global level is severely constrained. Hence, the paper suggests strategies for formulating and coordinating the implementation of comprehensive regional and national policies for the development of digital libraries and archives in Africa ensuring effective preservation of and access to African resources and enabling resource sharing between Africans as well as on the global scale. The paper concludes by stressing that neither the Millennium Development Goals (MDGs) nor the entire Africa's development agenda will be attainable without developing a strong and sustainable knowledge base by establishing a powerful and enduring backbone of information infrastructures capable of creating links for effective intra and inter-continental sharing of knowledge resources. The paper therefore recommends the setting up of a coordinating agency under the African Union (AU) to develop a policy framework on the basis of the various existing national policies, and to monitor and coordinate implementation at various levels.

Keywords: Africa, Digital Libraries, Digital Archives, Access to Knowledge.

Introduction

The truth of the "Digital Divide" manifests the deepening crisis that characterizes

access, processing, preservation and sharing of information/knowledge in Africa. Because knowledge is generally not given priority in Africa, instruments for its production, access, processing and preservation suffer serious neglect. Overall, Africa has one of the weakest information and communication infrastructures in the world, characterized by limited geographical coverage and bandwidth, poor interconnectivity among countries and low quality of services (ECA, 2005). According to International Telecommunications Union's (ITU's) survey between 2000 and 2006, Africa stands out with very low levels of access to ICT. By the end of 2007,... while broadband penetration stood at less than one percent in Africa, it had reached much higher levels in Europe (16%) and the Americas region (10%) (ITU, 2009). Moreover, the 2010 edition of the ITU Report, covering 2002-2008, shows the following:

a) Low (ICT Development Index (IDI) values between 0.79 and 2.04): This group is composed of countries with low levels of ICT access, usage and skills. It also accounts for one-third of the population covered by the IDI (36.1 per cent) and comprises 46 countries, 31 of which are African. It also includes Haiti from the Americas region, five Arab States, and nine countries from the Asia and the Pacific region (including India).

b) A regional comparison of prices for fixed broadband services highlights a striking disparity, mainly between Africa and the other regions. On average, a high-speed Internet connection represents 500 per cent of average monthly GNI per capita in Africa, making fixed broadband effectively inaccessible for most people in the region. (<http://www.itu.int/>)

Therefore, African knowledge institutions (Libraries, Archives, etc) logically suffer serious neglect, as a result of which they are still largely traditional despite the digital revolution that has transformed them and their functional roles elsewhere. How can African countries develop policies and strategies for bridging the digital gaps to enable their information institutions, specifically libraries and archives, provide effective access, sharing and preservation of knowledge for development?

That is why this paper attempts to examine:

(a) The provisions made in terms of laws, policies, agencies, institutions and infrastructures that serve as a basis for knowledge sharing in Africa;

(b) African information policies as general frameworks for policies on digital libraries and archives;

(c) The elements that constitute the dilemma in achieving the objectives of effective knowledge sharing in Africa, and the immense potentials that can be harnessed to tackle the challenge.

The paper further proposes how to formulate and coordinate the implementation of comprehensive policies and strategies for developing digital libraries and archives in Africa. It is imperative indeed to stress the inherent dangers in the attempt to realize the entire Africa's development agenda namely Millennium Development Goals (MDGs)

without a strong and sustainable knowledge-sharing base. Such a base is possible only when comprehensive, consistent and well articulated policies have been put in place. In view of all this, the paper recommends the establishment of a coordinating agency under the African Union (AU) to develop such a policy framework based on the existing policies, and to coordinate and monitor its implementation at all levels.

Overview of Current Provision and Infrastructure

Africa has great potentials to develop sound and sustainable knowledge base through accessible digital library and archival services throughout the continent. Diarra (2008), Microsoft Chairman for Africa, reported to the Second African ICT Best Practices Forum which took place in Ouagadougou, Burkina Faso on April 2008, that Microsoft has been investing millions of dollars in offices, training centres, education programs and e-government projects to help bring developing communities into the digital age. Microsoft recognises that it can and should make a substantial contribution, through partnership, towards enhancing Africa's capacity for development so that the continent can benefit from internally generated and sustainable development. The over-arching goal is to ensure that technology supports and accelerates progress towards the Millennium Development Goals and sustainable development in Africa. (www.africaictbestpractices.net)

Similarly, in his opening speech at the same Forum, the Chief Executive Officer of the Microsoft Corporation, Steve Ballmer, remarked that he was excited by Africa's incredible potent and its undeniable progress. He said that Africans had natural resources, of course. But more than that, they had an incredible richness in human resources. Nearly a billion people, almost two-thirds of them under the age of 30 and anxious for progress, opportunity and prosperity. For a company like Microsoft, it is impossible to look at these numbers without seeing huge opportunities for growth. (www.africaictbestpractices.net)

It was also reported by Reding in the same Forum that at the EU-Africa Summit in Lisbon on December 2007, the two parties agreed to develop a partnership through an eight point strategy. One element of the common strategy concerns science, space and the information society....the EU supports the development of infrastructures via the European Investment Bank, which granted during the last decade more than €270 million in loans in the field of telecommunications. The EU and its Member States in partnership with the EIB recently launched a Trust Fund to finance Infrastructure, which blends EC grants with the EIB's resources, as well as loans from the EIB-managed Investment Facility. The fund will soon finance the East Africa Submarine Cable System (EASSy). (www.africaictbestpractices.net)

All these are likely to significantly boost Africa's efforts towards continental interconnectivity and creating effective digital platform for effective information sharing. Despite these potentials, Africa's ability to develop effective information policy

instruments at national or regional level is seriously constrained. In most cases, such policy instruments are non-existent. Where they exist, they are mostly characterized by:

(a) Fragmentation (ECA, 2005) – disparate, uncoordinated policy instruments on ICTs, on telecommunications, on government information, etc, and absence of comprehensive framework for information production, management, transfer, access, utilization and infrastructure;

(b) Irrelevance/non-relevance – Mashinini (2008), who conducted a study on challenges of ICT policy in rural communities of South Africa, reported that the challenges ... include the capacity to develop policies, to consult with all the relevant stakeholders, and the communication process ... used. ... The policies being developed do not address the needs of the people. They are often seen as irrelevant to the society (Mashinini, 2008).

His conclusions are representative of Africa generally. While the degree of the situation varies from country to country, generally policies often address neither the actual short term development needs of the various segments of the people nor the long-term agenda for overall national or regional development. In most cases, rural communities that constitute the largest population in Africa are invariably neglected.

(c) Poor implementation mechanisms – poor logistics, poor allocation of resources (under-funding) and duplication of and conflict between implementation agencies. In this respect, Mashinini (2008) discovered lack of policy implementation. In the current situation, not all stakeholders are involved in the development of such policies. Therefore, both the policies themselves and their implementation are inadequate. Most of the projects thus fail in terms of clear deliverables, milestones, and associated risks and so on...Funding is limited, if not non-existent, especially for ICT projects (Mashinini, 2008).

In a similar manner, Schwabe observed that many factors are constraining the effective implementation of Spatial Data Infrastructures (SDI) in Africa including a lack of policy, poor management, the absence of institutional capacity and financial resources and limited access to appropriate technology (Schwabe, 2007).

(d) Lack of policy review instruments that are capable of responding to the changing environment and situations. Given that, evaluation is a precondition for review. Mashinini concluded that the last phase of the policy process is policy evaluation. Evaluation should be designed to measure and understand the impacts on policy of both internal and external elements such as changes in the political landscape, economic issues, social challenges, internal regulations, and so on. Owing to the fact that policies are not being effectively developed, implemented or monitored, no evaluation is taking place either (Mashinini, 2008).

Without evaluation the question of review does not arise. Therefore, policies are often outdated and hence unresponsive to the dynamic needs and more complex situations of society.

Despite this situation sound policies exist at regional and sub-regional levels; they may have some of the deficiencies mentioned above such as the lack of coordination and poor implementation, evaluation and review mechanisms. This only makes obvious the need to address these problems as a top priority. They have great potentials to be used as frameworks for comprehensive information policies for the continent. Such policies include the following:

(a) Broad based national information policies already developed by some African countries. Although such countries are few (Tanzania, Uganda, Ghana, with South Africa taking the lead), the policies can serve useful purposes in developing a continental framework. Depending on their level of development, different countries and regions have different priorities which are reflected in their policies; for instance, an analysis of the national information policies indicates that highly industrialized countries such as Japan, the United States of America, the United Kingdom and France address the need for information for research and development with great attention....while the countries in South America stress the role of libraries in the provision of information in general (ECA, 2005). Similarly, other countries that have announced their national policies and strategies for developing their IT capacities include India (IT 2000), Singapore (Singapore One) and Malaysia. Such policies address wide ranging issues that support IT development including curriculum development, changes in the education sector, soft and hardware, liberalization of the telecom industry, public sector reforms, and detailed development of a time frame (Olowu, 2004).

(b) African Regional Action Plan on the Knowledge Economy (ARAPKE) inclusive of the "Accra commitments for Tunis 2005" component (ECA, 2005): this is a framework for Action to galvanize African information environment and launch Africa into the information society. It was developed by the AU and coordinated by the Economic Commission for Africa (ECA). ARAPKE is a strategic and necessary reference tool for any information policy framework to be developed for Africa.

There are other contexts within which ARAPKE was developed, which include:

(a) African Information Society Initiative (AISI), which promises a sustainable information society in Africa by 2010 (Bahrul Islam, 2007). Many of the conditions stipulated for achieving the Initiative's objectives have not been met by the year 2010. The absence of monitoring and evaluation mechanisms makes it difficult to measure the level of implementation. However, given the 2010 edition of ITU Report in which virtually all the African countries (up to 2009) were still relatively far away from the Information Society, mostly characterized by low level of ICT access and use and low ICT skills, with majority falling in the Low IDI category (ITU 2010), AISI objectives are yet to be achieved. Probably, it was in realization of this and other failures that Nigeria has initiated a new project: Nigeria Vision 2020 Program, which aims at achieving the same objectives and

more. The National Technical Working Groups were scheduled to submit the Draft Vision Plan in September 2009 according to the Vision Program Plan (April 2009). The Draft has since been submitted. However, considering the failure of the previous plans – Vision 2010 and National Economic Empowerment and Development Strategy-1&2 (NEEDS-1&2) (2003-2007&2008-2011), etc. - which informed Vision 2020, it remains to be seen how the latter will turn out to be. In reference to policy planning in Nigeria, especially NEEDS, the Country Review Report of the African Peer Review Mechanism states that ...a number of stakeholders noted that development strategies, Plans and programs are perceived as political slogans that each administration brings in to gain some legitimacy, and not as genuine development initiatives for the betterment of the Nigerian people....There is also the general mismanagement and corruption including at the political leadership level, in program implementation. This has served to undermine effective program implementation (APRM, 2008).

(b) New Partnership for Africa's Development (NEPAD) under AU, which commits itself to ICT revolution in Africa, subsequent integration of Africa into the new information society (Schwabe, 2004). This is one of the Africa's externally initiated development program. Like all similar programs, NEPAD has been characterized by glaring non-inclusion of critical stakeholders, which raises their doubt and reservations about the sincerity and motives of the external development partners. APRM analyzed the trend historically; the approach to African development has been externally oriented. For the past four decades, the subcontinent has been negotiating its development with external partners. More often than not, this has meant that the process, instruments and outcomes of development have been determined by external partners, rather than by African societies and their leaders (APRM, 2008).

(c) World Summit on Information Society (WSIS) declaration that commits itself to creating an all- inclusive society where everyone can create, access, utilize and share information and knowledge (Girard & Siochru, 2003).The Committee on Development Information-Knowledge, Libraries & Information Services (CODI-KLIS) has also developed important guidelines and strategies which need to be incorporated in any comprehensive policies for developing knowledge networking and sharing in Africa. The sub-committee aims at proposing and advocating knowledge policies and strategies for Africa's development and ... raising of awareness of the value of libraries, knowledge and information in economic growth and human development, promotion of the development of national knowledge systems in member states, identifying priority issues in information and knowledge policies and institutions, examining and reviewing progress made by member states, facilitating capacity building with regard to development of systems and services for the Information Society and knowledge economy, reviewing recent and proven technical trends and status of knowledge and information practices in global context, developing and

supporting the establishment of national, regional and global networks and partnerships, and reviewing of ECA work program in the area (ECA, 2005).

In terms of information infrastructure, physical and virtual structures and facilities, Africa has made some modest progress, which with some resuscitation or upgrading, as the case may be, could easily be converted to serve as platforms for developing digital libraries and archives in Africa. They include:

(a) National Information and Communication Infrastructure (NICI), which has been completed in more than half of African countries with report of good progress in more than two-thirds of others (Azubuikwe, 2007). NICI has been established to facilitate the achievement of the Millennium Development Goals (MDGs), and launch Africa into the information society by providing comprehensive packages of information and communication infrastructure that promotes free and equal access to knowledge, promotion of knowledge management and dissemination, enhance e-government initiatives in Africa, and focusing on content in all its forms;

(b) The African Virtual Library and Information Network (AVLIN) - The ECA Library (ECA, 2005). Membership of AVLIN is open to all Africans free and its online services accessible globally;

(c) Regional Informatics Network for Africa (RINAF) developed by Intergovernmental Information Programs (IPP) of UNESCO to provide internet services to several African countries. According to the plan five regional and 10 national nodes were to be established, with the central African regional node located at NACETEM, Obafemi Awolowo University, Ile-Ife, in Nigeria (Filani, 2002);

(d) The satellite-based Cooperative Information Network (COPINE) INITIATIVE, which initially linked scientists in 12 African countries and selected hospitals, universities/institutions and documentation/information supply centers. COPINE's interactive capability enhances information sharing and collaboration among African scientists, researchers and professionals and offers "full and open access to the depository of libraries of regional and global scientific and technological information networks..." (Filani, 2002); and

(e) Pan Africa Development Information System's (PADIS's) CABECA (Capacity Building for Electronic Communication in Africa) - a UNECA project to promote computer networking throughout Africa (Filani, 2002).

There are many other conditions that favor Africa and help to facilitate the development of the above with positive implications for the economics of developing networking infrastructure and facilities in Africa. They include: (a) Geography/topography that permits easy mobility; (b) Abundant human and natural resources that can easily be harnessed and mobilized for development purposes. Adult literacy rates in sub-Saharan Africa range from 32.7 % in Chad to 93% in Equatorial Guinea (UNESCO, 2008) with

average rate of about 70%. Literacy rates for the youth, who constitute the most productive segment of the population, are higher – 45.1% for Chad and 99.1% for Equatorial Guinea (UNESCO, 2008) and about 77% average. The assertion here is that all these remain only potential – great potential – for Africa. The deployment of their productive energies and channelling them into projects for development purposes depends on some other variables, the key of which is good governance.

(c) Relatively stable / predictable weather/climatic conditions and relative freedom from natural disasters; and (d) diverse cultures with rich indigenous knowledge resources. Often, diversity in Africa becomes a source of friction and open conflict, mostly as a result of unhealthy rivalries for resources. While indeed this may constitute an impediment to development, with good governance and growing knowledge the situation is likely to continue to diminish.

The structural dilemma

Despite the immense potentials of Africa, the continent is generally riddled with problems that must be addressed in order to develop effective strategies for knowledge networking and sharing. These include: Socio-political and economic instability including poor governance, conflicts, weak civil society, low capacity utilization, underdeveloped economies, etc. APRM (2008) reported that...Nigeria reflects the communality of many African countries in that systemic governance problems, capacity constraints and ineffective implementation of laws have led to limited economic growth and transformation. The...economy is highly uncompetitive and characterized by, among others, a large informal economy, high levels of unemployment, high cost of doing business and significant idle capacity. Despite its rich mineral resource base, Nigeria hosts the third largest concentration of poor people in the world (APRM, 2008)

- Poor education system - under funding, poor policies, high illiteracy rates, low research capacity, declining quality of learning, poor facilities;

- Poor ICT culture - general lack of capacity to use and adapt to local needs, poor application/poor local content development, low internet access capacity (low speed/broadband penetration).The comparison of broadband subscription between the continents, as provided by the International Telecommunication Union (ITU, 2007) below, is both illustrative and instructive.

- Africa - 0.5%
- Oceania - 1.6%
- Americas - 30.5%
- Europe - 33.7%
- Asia - 38.3%

- Lack of coordination at all levels (ECA, 2005) - local, national, regional, etc.

characterized by:

- Duplication of institutions, agencies, policies and infrastructures;
- Fragmentation of similar or same functions and responsibilities into different structures;
- Conflicting legislations; and
- General lack of institutional collaboration/linkages, networking and resource sharing.
 - Underdeveloped information environment characterized by:
 - Poorly funded information institutions (libraries, archives, etc) (ECA, 2003);
 - Low information mobility - poor transportation, power and telecommunication systems, poorly and irregularly organized interactive forums (debates, symposia, conferences, discussions, Rallies, seminars, etc);
 - Poor reading and information-seeking culture, low literacy rates (according to UNESCO average adult literacy rate was about 70% , much lower in many countries); and
 - Generally Unfavorable government attitude to development information.
 - Neglect of the under-privileged groups (the physically challenged, the inmates, the elderly, the rural communities, the urban poor, etc) in terms of information provision.

The above elements are the factors that necessarily inform the conception, formulation, implementation and review of policies on digital libraries and archives in Africa.

Strategies and policies for digital libraries and archives

Based on the above discussions, it is imperative to assess Africa's strengths, weaknesses, opportunities and threats (SWOT analysis) as the first step in developing strategies and policies. In this respect, each of the SWOT elements can be analyzed as follows:

- The strengths of the continent lie in its existing infrastructure, natural resources, good terrains, good climate and trainable manpower;
- The weaknesses include lack of coordination, poor resource management, poor information environment, and poor ICT culture;
- The opportunities include abundant human and mineral resource potentials; and
- The threats are rooted in political and economic instability, poor governance and high illiteracy rates.

Based on this conceptualization and the thorough analysis of all the elements involved, especially the human elements (information needs and seeking behaviors, demographic profiling, and human resource and institutional capacity), the proposed agency set up by the AU should formulate a comprehensive, consistent and well articulated policy on digital libraries and archives for the continent, taking cognizance of the following as the necessary consideration, assessment and provision to be made for all-inclusive framework.

a) Level of infrastructures required: This requires a definition of, and decision on the types and level of infrastructure for access, in terms of ICT connectivity in libraries and archives, and in both public and private institutions. This entails telecom infrastructure – backbones, network and transmission systems (telephone/Dial up , DSL/fiber optics, digital radio/WLL, satellite (VSAT/Subscription satellite), LAN, bandwidth size (fixed broadband Internet, mobile broadband, fixed and mobile broadband cellular telephony, etc.), nodes, internet Exchange Points, ISPs, ICT Parks, digital transaction and security, ICT training, hardware and software development and Research & Development infrastructures, end user facility – intranet systems, PCs, peripherals, cyber cafes, etc.

b) Existing infrastructures to be used: The policy process regarding this should begin with an audit, mapping and assessment exercise to determine the existing, i.e. the already available, infrastructure and to use that to inform the decision above. This will provide significant insights regarding the areas of deficiency that need to be rectified and areas of strength that need to be used as a basis further development.

c) Location and spread of infrastructures for accessibility: It is necessary to identify the appropriate locations and spread of infrastructures – nodes, wireless equipment, exchange points, even databases/servers, etc. – for effective access across the region and sub regions.

d) Connectivity to different institutions across the continent: For effective access, priority institutions such as institutions of learning, public libraries, research institutes, government agencies, media houses, etc. should be identified for interconnectivity. While this is a responsibility of individual countries, a regional policy should provide a framework to ensure inter operability, consistency and seamless sharing of knowledge.

e) Characteristics of different categories of personnel required: The framework should define the nature and characteristics of personnel (including educators, trainers etc.), education and training requirements, training institutions, and different skill and competency levels for effective implementation of the program.

f) Diversity of cultures, languages, literacy level and other demographic characteristics across the continent: Africa's diversity calls for special planning. Culture, language and literacy level are critical in knowledge sharing. The nature of provisions made on these elements in the policy document and the extent of their implementation will determine, to a large extent, the level of the project's acceptance and success.

g) Funding levels required (initial and sustained investments): The quantum of resources required for the initial takeoff of the project should be estimated based on realistic assessment of the dimension of the project, its context and the prevailing market situation. There should also be unequivocal provisions on the quantum of investment required on some regular and continuous basis to support the project.

h) Sustainability of the project/roles of member countries: The policy instrument should provide mechanisms for the sustainability of the project. Responsibilities should be

clearly defined and appropriately shared between all the member states.

i) Relevant agencies/institutions/organizations to be involved: For effective coordination and facilitation, the policy instrument should identify all agencies, institutions and organizations whose services, expertise, support or assistance are required at any stage of the project. It should also clearly state the level and nature of their involvement.

j) Take off of the project and timeline – when? How? Both the starting and terminal points of every phase of the policy, i.e. the timeframe within which a set of objectives are to be achieved, should be clearly stated in terms of specific dates, when to start a phase and when to end with articulated timeline programs, logically sequenced. It is important to make provision on how the project takes off, demanding for transparency and accountability with information about project cost, capability, resources, funding, management, etc.

k) Nature of services to be provided and conditions for access: This is one of the key issues to be clearly articulated in the policy plan. Questions of resources and services to cater for the diversity of user community – nature of the resources and services, language consideration (translation, transcription and transliteration), resources and services for rural communities, illiterates, etc. What should be the terms of access?

l) General and sector implementation procedures, strategies and schedule/time frame: General implementation procedures and strategies, to do mostly with infrastructure, have to be developed and clearly stated with timeframe for set targets. This equally applies to sector implementation, which has to do with resources and services. Because of the varying needs of the user community - individuals, institutions, departments, agencies, etc. - procedures and strategies are necessarily informed by this segmentation in order to address specific sector needs as they arise.

m) Policy implementation, monitoring and evaluation, review modalities and procedures and schedule/ time frame: This entails strategies and provision for Implementation Committee that is sufficiently representative of the entire region, for fund mobilization, for effective monitoring and evaluation mechanisms, and for both periodic and timeline review. To ensure logical implementation process and orderly achievement of the policy objectives, strategies should take cognizance of sector peculiarities.

n) Publicity and sensitization: The policy process must ensure elaborate provisions on strategies for adequate sensitization, mobilization and involvement of all stakeholders of all stakeholders. Adequate publicity mechanisms should be provided to ensure that sufficient information is provided about the project through interactive forums, linkages and judicious use of the mass media.

o) Legislation: There must be legal instrument to support all the policy provisions above. In fact, the entire policy document must be contextualized within the different legal systems that exist in various member states. The content of the policy document should be

structured based on the elements below:

- i) Vision, mission and objectives of the project must be clearly stated.
- ii) Identification of the various communities to benefit from the services
- iii) Scope and limitation of the project
- iv) The composition of the implementation monitoring and coordinating agency
- v) Review process

Conclusion

This paper has outlined the processes of developing a comprehensive policy framework and strategies for digital libraries and archives in Africa. It is only a comprehensive outline the details of which could produce a comprehensive policy document for the region. At least, the outline is comprehensive enough as to cover every conceivable element required for policy development. Developing such a policy and strategies at continental level is one way of addressing the challenges of the “Digital Divide” and poor access to and sharing of information, especially development information, which confronts the African continent. The paper recognizes the need to address policy issue at a continental level as the most effective strategy to face up to this challenge comprehensively. In order to ensure the effectiveness of the policy instrument in both content and operation, the paper recommends:

(a) That an agency be set up by the African Union (AU) to develop a comprehensive policy framework for digital libraries and archives for the African continent and to coordinate, monitor and evaluate its implementation in member states;

(b) that it is imperative to emphasize in the policy instrument the necessity of democratizing access to knowledge/information by developing mechanisms for, and ensuring effective collaboration, networking and vigorous publicity and public sensitization;

(c) the upgrading of AVLIN so that it serves as the central node given its strategic position and the structures it already has in place;

(d) that African nations should recognize the strategic importance of adopting the continental policy instrument as a basis for their national information policy frameworks, especially where such policies do not exist; and

(e) the recognition of the necessity to emphasize the dissemination of development information and indigenous knowledge produced in Africa and elsewhere.

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Higher Education and Knowledge Management

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Abstract

In this paper we argue about Knowledge Management (KM) and its implications for academic productivity with focus on models of changes in knowledge production posited by Gibbons et al and community model of knowledge management, especially in a transitional society as Iran. Based on the above argument, we have discussed the relationships between research and teaching productivity, briefly. Because of the significance of Higher Education and its relevant institutions (university and related communities) in knowledge management, we have raised some questions about reform in higher education and its relationship with knowledge management. Finally, knowledge is considered as culture or wisdom. In this approach, it is important to pay serious attention to the cultural aspect of knowledge especially in wisdom.

Keywords: Knowledge Management, Knowledge Production, Higher Education, Academic Productivity, Community Model, Wisdom.

Introduction

Types of knowledge

Knowledge can have various meanings. As Weert put it, there is common sense or ordinary knowledge which anybody may have and there are practically-oriented and technical and scientific types of knowledge. Common distinctions are made between universal and local knowledge and between explicit or codified and tacit implicit experiential or reflective knowledge. Others define knowledge as that which is acknowledged only within specific scientific paradigms or academic communities.

(Weert, 1999). Also different types of knowledge can be categorized in terms of know-what (related to facts), know-why (related to causes & effects), know-how (related to skills), know – who (related to social relations and contexts). One of the classical distinctions, which became central for knowledge in organizations, is the differentiation of implicit and explicit knowledge of the Michael Polanyi. According to Polanyi (1958), implicit knowledge refers to that knowledge of a person, which has to do with his or her personal experiences, his or her biography and others learning processes in the meaning of

an individual know-how We know more than we know how to say (Krings, 2006). On the contrary, explicit knowledge is a formal and documented knowledge, an individual knowledge, which is markedly conscious and functional.

The Concept of Academic Productivity

The concept of academic productivity may be understood as a creative, original activity, academic vitality and so on Higher Education. In the scientific community, the term scientific productivity was originally used by Merton (1938) in the *Sociology of Science*, focusing on the natural sciences as an indicator of level of activity within the scientific community.

According to Arimoto (2006), The term academic productivity was introduced into the field of Higher Education research in Japan, in 1973, by Michiya Sinbori, as a modified concept of scientific productivity—with a focus not only on the Natural Sciences but also on the Humanities and Social Science. This concept was introduced into the sociological study of education in the author's original definition of this concept in the Shin-Kyoikushakaigaku Jiten (Japan Society of Educational Sociology): an indication to know the creative activity outcome made by scientists involved in attempting to make new discoveries and inventions of social theory, law, concept, material, etc.

This new concept of academic productivity is still focused on research activity related to knowledge. In the present Arimoto's view, this concept is not only adaptable to research but also to all functions of knowledge, and hence academic productivity is thought to apply to research, teaching and service productivity. This concept is a total indicator of the level of activity of academic community while both scientific community and academic community share the concept of research productivity (Arimoto, 2006).

Definition of the Wisdom

According to Oxford Companion to Philosophy, wisdom is a form of understanding that unites of reflective attitude and a practical concern. The aim of attitude is to understand the fundamental nature of reality and its significance for having a good life. The object of practical concern is to form a reasonable concern for good life. .. and to evaluate the situations in which they have to make decisions and acts from its point of view (Hondrech, 1995). Actually, wisdom as a type of knowledge accords to categories mentioned in types of knowledge that related to know- what and know-Why.

Social Development and Community Model in knowledge management

The university as a place of inquiry and production of knowledge is keenly related to social development. Social development defines the university and vice versa. University's nature has gradually changed in accordance with social development; in particular, present

society faces an age of huge structural change, which affects (among others) university and knowledge (Arimoto, 2006).

Some scholars have studied the process of shifting in accordance with management of knowledge or mode of knowledge production. The change is, from analog to digital, from formal knowledge to tacit knowledge and so on.

Definitions of KM abound, but its core features focus on intensifying the exploitation of knowledge to improve organizational performance. Bassi pointed out that KM is the process of creating, capturing, and using knowledge to enhance organizational performance (Scarborough, 2001).

For reaching to this plan, it is necessary to transform the mode of knowledge production in universities. Va "limaa and Hoffman (2008) say that a radical metamorphosis is taking place in the relationship between knowledge production and university, as an institution. Authors like Gibbons et al. (1994), Nowotny et al. (2001) and Etzkowitz et al. (2000) propose that governments have promoted national prosperity by supporting new lucrative technologies together with the universities which become engines of their regions. Gibbons et al (1994), argue that a new form of knowledge production 'Mode 2' is replacing the traditional one, Mode 1. 'Mode 1 knowledge' has been produced within autonomous disciplinary contexts governed mainly by academic interests of a specific community whereas ' Mode 2 knowledge' is produced within the context of its application. 'Mode 2 knowledge' is transdisciplinary research characterized by heterogeneity and more socially accountable and reflexive than 'Mode 1 knowledge '. In addition, the proponents of the concept argue that universities are losing the monopoly of knowledge production because knowledge may be produced in a variety of organizations and institutions (Va"limaa & Hoffman, 2008).

However, we argue terms of the emergence of a new 'mode of knowledge production'. This analysis suggests that the focus of knowledge production in Knowledge Management is increasingly shifting away from the 'Mode 1' (university-based, science-push) to a 'Mode 2' (where knowledge is produced at the point of application). Table 1 summarizes the characteristic features of these different modes.

Table 1

The Two Modes of Knowledge Production

Mode 1	Mode 2
Problems defined by academic community Knowledge	Produced in the context of its application
Disciplinary knowledge	Transdisciplinary knowledge
Homogeneity of skills and knowledge production sites	Heterogeneity of skills and knowledge sites
Hierarchical and stable organizations	Heterarchical and transient organizations

Mode 1	Mode 2
Quality control by the invisible college	Socially accountable and reflexive

(Adapted from Gibbons et al in Scarbrough, 2001).

An important notion about new meaning of knowledge is located in 'mode 2' production of knowledge. For this reason we present Table 2. In this table community model in knowledge management equals with the new meaning of knowledge in Higher Education. Scarbrough has mentioned that the cognitive position aligns with the emphasis on the use of IT, which is an important characteristic of much of the KM literature. .. Conversely, the community view emphasizes a rather different set of management practices to do with the social and organizational context in which knowledge sharing takes place (Scarbrough, 2001).

Table 2

Competing Models of Knowledge Management

Cognitive model	Community model
Knowledge is equated with objectively defined concepts and facts	Knowledge is socially constructed and based on experience
Knowledge can be codified and transferred through text: information systems have a crucial role gains from knowledge management include exploitation through the recycling of existing knowledge	Knowledge can be tacit and is transferred through story-telling within social networks gains from knowledge management include exploration through the sharing of knowledge among different social groups
The primary function of knowledge management is to codify and capture knowledge	The primary function of knowledge management is to encourage knowledge-sharing through networking
The critical success factor is technology	The critical success factor is trust and collaboration
The dominant metaphors focus on the physical extraction and storage of knowledge-e.g. data mining, data warehouses	The dominant metaphors focus on the human community

Source: (Swan et al., 1999 in Scarbrough, 2001)

As Table 2 indicates, there are a number of important differences between the cognitive and community models of KM, deriving from radically different understandings of the nature of knowledge and its creation. At the same time, however, we need to recognize that these are differences within the broader discourse of KM. Thus, both cognitive and community models alike take as axiomatic the need to 'capture' knowledge for the benefit of the organization. While their preferred means may differ (codification of knowledge on

one hand, story-telling practices on the other) both approaches share a common interest in this intensification of knowledge work. In sum, a number of the features of the discourse and practice of KM correspond to the Mode 2 characterization of knowledge production that is useful for social development.

Applying the Community Model of Knowledge Management Necessary Reform in Higher Education for Transitional Society

This community model, which stresses knowledge and culture, is taken from the academic concern and process of social development mainly related to the field of Sociology Of Science, and new Sociology Of Knowledge (Swidler & Ardit, 1994; Zammito, 2007). But as Prpic (2007) pointed out: What would be the most fruitful sociological approach for empirical studies of the changes of social and intellectual organization of science, especially scientific production and productivity? It appears that the most relevant sociological theories of scientific fields (organizations) that bridged the gap between the traditional and constructivist views of science. Prpic has also mentioned five traditional models of scientific fields e.g. post-academic science (Ziman, 1996), the new mode of knowledge production (Gibbons et al., 1997), triple helix (Etzkowitz & Leydesdorf, 1998), academic capitalism (Slaughter & Leslie, 1997) and science in the agora (Nowotny et al., 2003) and highlights that these can not be suitable theoretical frameworks for studies in Sociology Of Science, especially research systems in transitional societies because of two reasons :

The first concerns the clear demarcation of the traditional and new mode of scientific production in the models, as well as their insufficient theoretical elaboration. Regardless of whether they explicitly mention Mode 2 or mention it not at all, researchers will at best find a combination of old and new knowledge production modes. The identified modes of knowledge production in sociology and economics do not speak in favor of Mode 2, despite the differences in the level of instrumentalization of knowledge among these disciplines.

The second and most important reason why the said models were inappropriate for analyzing transitional societies lies in the nature of the social context in which these changes in knowledge production were identified. This context was the world's most developed countries with powerful economies and technological and scientific potential, massive investments in R&D and competitive research systems (perpic, 2007).

Considering such background, the paper intends to make some agreements with regards to the themes "knowledge" and " culture" that inevitably have a great deal of impact on Higher Education reform.

Importance of Academic Productivity

The university is by nature a knowledge-based association, an organization whose

foundation is knowledge. Because the relationship between knowledge and the reform in Higher Education is tight, the community model focuses on knowledge assuming knowledge as the major determinant of university structure and operation. This approach emphasizes that academic work is basically knowledge, or application of knowledge both as stuff and means. In other words, we need to pay much attention to the nature of knowledge, of scientific knowledge. In this context, the term scientific productivity as well as academic productivity are used in the field of Sociology Of Science (Arimoto, 2006). Academic productivity dealt with the Humanities and Social Sciences, in addition to Natural Sciences. Moreover, Arimoto (2006) thought of the theoretical possibility of academic productivity - including teaching, service, administration and management productivity. Among these, he also pointed out the importance of both "research productivity" and "teaching productivity" paying much attention and consideration. Higher Education reforms are needed in terms of intentional integration of two separated orientation, as shown in Table 3. Concretely, systematic improvement in academic productivity related to academic organization, faculty and students. Faculty development (FD) in particular is an important and identifiable activity for realizing this purpose. The extent of institutionalization of (FD) into universities and college provides a kind of barometer to estimate realization of the propose and practice of academic productivity (Arimoto, 2006).

Table 3

Integration of Research and Teaching Orientation for Academic Productivity

Separating and Integration	Teaching	Research
Separating	1.Teaching orientation	2.Research orientation
Integration	3.Teaching-centered integration	4.Research-centered integration

Importance of Integration Knowledge with Culture and Wisdom

For presenting a critical view to the concept of information in Higher Education and Knowledge Management, especially in community model and its relation with the culture and society, serious attention must be paid to the meaning of wisdom and ethics. Considering that Wisdom lies in raising questions about knowledge, Sheth (2005) raised some question about knowledge in order to achieve wisdom and ethic." What do we do with the knowledge we have? What are its alternative uses? How do we make choices in the use of knowledge in a given situation? How do we assess and discriminate between the shades of use, misuse, abuse, overuse, underuse? (Sheth, 2005).

Finally he has discussed that Wisdom is thus based on the ideas of right and wrong behavior, that is, on ethics and crisis of ethic in current society, because the Ethics basically

comprises the conduct of a person or group in relation to others in support of crucial collective goals such as social stability, integrity, well being and progress.

Considering the above, the unprecedented advances made during last debates in the Information sciences has led to the emphasis on information gathering rather than understanding of what that information is about; especially in cognitive model of Knowledge Management in which information and emphasis on the use of IT has been dominated. Mary Midgley has said that when knowledge is. .. equated with information, understanding is pushed to the background and the notion of the wisdom is quiet forgotten (Midgley, 1991 in Golshani, M ,2008).

Several theorists of modernity have argued that information term will move to knowledge concept and the knowledge should be equipped with wisdom in order to face the challenges in a new situation (especially in Higher Education). Knowledge is a deliberate utilization of information. Wisdom means to behave according to a shared knowledge in order to enhance the well- being of everybody in the awareness that personal actions have a social consequence, that today each part of the world is connected to the others. If we want to contribute to the actualization ' wisdom ' in which there is a deliberate use of knowledge, it is necessary to develop in each person, in a well balanced way, different dimensions of his/her being, i.e. the knowledge and economic dimensions together with the creative and spiritual dimensions. Each person should be aware of the responsibility to fully exploit his/her own potentialities and at the same time, to act as a member of a society. In other words, everyone has to understand the consciousness of the social impact of his/her actions. If these are the real frames and the most likely perspective of our society, it is very important to educate and train people for living and acting properly in a dynamic and more and more complex society of the global context (Blasi, 2004).

On the other hand Delanty (2001) believes that most important crises of university originate from culture. He uses a power title for his view: the university is the place where knowledge, culture and society interconnect. For more comment about Higher Education and its connection to culture, we outline some points regarding Delanty's arguments:

- I. Universities are dominant and emerging cultural models of society.
- II. University should not focus merely on knowledge as information or as science, but on deeper conceptions.

The demise of universities in developing countries especially in Islamic countries may be worse than that of western countries. Golshani (2007) pointed out that in addition to western university, unfortunately, the universities of the Islamic world including those of Iran, have focused merely on the education of science tending to neglect the three main basics of culture which are philosophy, metaphysics and divine insights .

In addition many different studies have talked about the role of culture in Higher Education and Planning for its future perspectives. We have mentioned some of this in the following:

- Opie (2001) in his report about New Zealand (*Knowledge, innovation and creativity: designing a knowledge society for small democratic country*), pays attention to the importance of Cultural knowledge, defining it as a nation's whole stock of knowledge (including science and technology) that is shaped by values, beliefs and tradition, as well as the knowledge created by artists and people in the ordinary processes of social living.

- Swedish Institute for Studies in Education and Research (SISTER) in a grant research project (*Culture in knowledge society*) and some sub projects in 2001-2003 has complimented: cultural life, cultural politics and democracy - Labour markets, professions, and life styles of the new cultural society - cultural and creative places in knowledge society and culture in the new economy. In programme area (*Cultural and creative places in knowledge society*) Maria Wikhall and Carolina Sigfridsoon indicate in their project, (*Arts in Universities: A study of higher education in Sweden*), that universities are facing important challenges, their traditional role of pursuing academic goals and striving for international excellence are continuously being challenged by their role as national and regional boosters of wealth and prosperity. Universities are also to an increasing extent competing with knowledge producers and educational organizations at an international arena. They therefore have to develop explicit strategies to meet rapidly changing demands and preconditions of the surrounding society. The aim of this project is to consider the role of culture for universities in a broader sense and to illustrate and analyze this role empirically by investigating the growth and development of Higher Education directed towards the cultural domain or the experience industry. The empirical part of the study shows that there is an increasing number of interdisciplinary educational programmes integrating art with subject from other disciplines (Sister, 2004).

- There are multiple drivers of the accelerating change many of them are now referred to as futurists. They include rapid economic and cultural globalization, a shift from an energy-based industrial economy to a service and knowledge economy, the emergence of the knowledge society, dazzling technological innovation as a consequence of the confluence of the GRIN technologies (Genomics, Robotics, Informatics and Nanotechnology), accelerating urbanization, shifting age demographics, radical changes in geopolitics, the end of the cold war, disintegration of the old Soviet Union, and the emergence of an enlarged European Union and environmental pressures including climate change.

To adequately prepare people and communities for new condition, revolutionary changes are required in university's mission, curriculum content, pedagogy and modes of inquiry.

Conclusion

In this paper we paid attention to two modes of knowledge production in Knowledge Management and Higher Education and their facing challenges. We propose that if Higher Education and Knowledge Management want to recover from their demise or crises, they must move toward wisdom or culture. Finally, some directions have been proposed for the future of Higher Education in 21 century. This process also includes Knowledge Management. As International Institute for Sustainable Development (2005) has used the definition of post- modern knowledge management as the recognition of informal paths of communications and relationships that cannot be systematized or managed but instead need to be fostered; attempts to find tools that can begin to merge formal and informal channels: blogs, mining e-mails, etc.

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