Original Paper

Transformation of Institutional Repositories and the Knowledge Economy: The Imperatives of Knowledge Management in Libraries

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Abstract

There is mutual intercourse between traditional roles of libraries and knowledge management practices which are concerned with how organisations track, measure, evaluate, share and make use of both tangible and intangible assets to meet their institutional or organizational demands. The establishment of institutional or knowledge repositories is a response to the demands and realities of acquiring , deploying and using new technologies and strategies to create , document , store , disseminate and reuse information to advance organizational objectives and mission. This paper discusses concepts of transformation, knowledge, knowledge management and the knowledge economy. It also touches on how knowledge is managed, paying specific attention to the role of libraries and librarians in knowledge management. Critical factor of IT/IT-based skills and funding are discussed as vital in achieving its success.

Keywords

transformation, libraries, institutional repositories, knowledge, knowledge economy, knowledge management

1. Introduction

Knowledge repositories are a product of advances in information and communication technologies (ICTs) and their exploitation by libraries in delivering information services. Communication is increasingly being seen as fundamental to knowledge flow (Wikipedia, 2015). Libraries have become interconnected, interoperating and collaborative in acquiring, transferring and sharing information and knowledge. The importance of information and knowledge permeates all aspects of human endeavour

such as educational, political, social and economic spheres. Knowledge is needed to not only transform individuals but also the society as a whole.

The paper focusses on the transformation of institutional repositories to meet the demands of the new knowledge economy. Institutional repositories are seen as agents of change and transformation and this can be achieved through planning, gathering, strategizing and implementing set services by deploying relevant technologies in the new digital and online environment

2. Transformation

Several definitions of the term abound. The Cambridge dictionary defines it as a complete change in the appearance or character of something or someone, especially so that that thing or person is improved. Rapid advances in IT have transformed our lives in both industry and society. Organisations and institutions are not left out. In an organisational context, transformation is a process of profound and radical change that orients an organisation in a new direction and takes it into an entirely different level of effectiveness. It connotes using cutting-edged technologies to achieve more purposeful results. Suleiman (2011) sees transformation as a complete change from one situation to another, a total departure from the old to a new one.

We can therefore perceive transformation in knowledge repositories as the activities and processes of creating and implementing the acquisition of new knowledge in order to meet dynamic needs of our users by deploying appropriate personnel and technologies to facilitate more efficient services.

2.1 Information as what?

The world greatest gift and asset of the 21st century is information. Contemporarily, it is one of the most priced assets indeed. Relevant information is highly revered because it has the power to do two great things, (i)it must add to the stock of our knowledge and (ii) it should bring about some behavioural change or propel us to take action.

In this information age, information is taking the central position in all sphere of endeavour: education, business, politics and social life. The term information has semantic and conceptual perspectives, meaning different things to different people. To some it's all about news; to others it maybe facts and yet to others still, it is data. For data to become information, it must be contextualized, categorised, organised, interpreted and condensed. By so doing, data becomes relevant and purposeful having undergone some degree of processing.

Essentially, information is found in answers to questions that begin with words such as who, what, where, when and how. Today, Information and Communication Technologies (ICTs) have become inestimable in their capacity of turning data into information, particularly in large firms, institution and organisations that generate large amount of data across multiple departments and functions. Information is not independent of our social practices. Its overriding importance lies in it as a basis for adequate and successful choices and behaviours in all sphere of human activity.

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3. Knowledge

Knowledge is a mix of framed experiences, values, contextual information and expert insights (Davenport & Prusack, 1998). Knowledge comprises strategies, practices, methods and approaches (how). It is closely linked to doing (action) and implies 'know-how' and understanding. The knowledge possessed by an individual is a product of experience as well as continuous thirst for more information. Nnadozie (2015) describes knowledge as information that is relevant and contextual having evolved from experience gained over a period of time. Knowledge is highly valued because it is closer to action while information on its own does not make decisions. It is emphasised that it is the transfer of information in to people's knowledge base that leads to decision-making and thereby into action. Thus knowledge is information with direction which leads to appropriate actions. Simply put, knowledge is information put into action. Scholars in the field have identified two dimensions of knowledge-Explicit knowledge and Tacit knowledge.

Explicit knowledge is formalised or codified knowledge. It is easy to identify, store and retrieve. It is sometimes referred to as "know what". It is effective and facilitate the storage, retrieval and modification of documents and texts. 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. It is considered simpler in nature and does not contain the rich experience-based "know-how" that can generate lasting competitive advantage. KM initiatives driven by technologies have often had the flaw of focussing almost exclusively on this type of knowledge. Explicit knowledge is found in books, journals, memos, notes, reference sources, electronic databases and the likes. It should be noted that unless deliberate efforts are made to convert tacit knowledge to explicit knowledge, it will not be possible to reflect upon, study and discuss and share it within the organisation (institution) Since it will remain hidden and inaccessible inside the heads of the persons that have it (Uriate, 2008).

On the other hand tacit knowledge also described as "know-how" refers to intuitive, hard-to-define knowledge that is largely experience-based. It is context-dependent and personal in nature. Tacit knowledge is regarded as the most valuable source of knowledge and the most likely to lead to breakthrough in organisations. In daily practice, it is near impossible to convey our intuitive understanding acquired from years of experience and intuition. Thus it will be quite impossible for an auto-engineer or pilot to codify their knowledge into a document that could convey their "know-how" to a beginner. This is one reason why experience in a particular field is so highly regarded in the job market. Since tacit knowledge is so individualised, the degree and facility by which it can be shared depends to a great extent on the ability and willingness of the person possessing it to make it available to others. Tacit knowledge is crucial to getting things done and creating value for the organisation. Tacit knowledge can be shared and communicated through various social, official or professional activities that facilitate exchange such as conversations, workshops, conferences and on the job training. Therefore, it is important for organisations and institutions to discover, propagate and utilize the tacit knowledge of its employees in order to optimize the use of its own intellectual capital. Tacit knowledge

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can only be seen through application and that is why it is difficult to capture, exploit and diffuse among organisation members.

3.1 Knowledge Economy

Knowledge economy as a phrase was popularized by Peter Drunker (1969). He described the difference between manual workers and knowledge workers. The manual worker according to him works with his or hers hands to produce goods and services while a knowledge worker works with his or her head, not hands, and produces ideas, knowledge and information. He opined that information and knowledge can be shared and actually grow through application.

The term knowledge economy is conceived by researchers to indicate and underline the pivotal role of knowledge in modern economic activities and relationships. Investopedia (2015) states that knowledge economy is a system of consumption and production that is based on intellectual capital. It arose out of the increasing complexity of Information and Communication Technology (ICTs) which have made production activities dependent on higher level of skills and knowledge capabilities. Brinkley (2006) stressed that participants or operators in the knowledge economy must not only possess multi-tasking skills but should also be technology-driven.

In a knowledge economy, a significant part of an organization or a company's values consist of intangible assets, such as the value of its workers' knowledge (i.e., intellectual capital). A knowledge economy does not emerge or exist in a vacuum. Azubuike (2007) describe 4 major pre-conditions that must be met before knowledge economy can take off. These are:-

- An economic and institutional regime which provides incentives for efficient use of the existing and new knowledge and the flourishing of entrepreneurship.

- An educated and skilled population, which creates, shares and uses knowledge to innovate and create economic value.

- A dynamic information infrastructure to facilitate the effective communication, dissemination and processing of information and

- An efficient innovation system of firms, research centres, universities and other organizations.

Economic success is increasingly being based on unhindered sharing and effective utilization of intangible assets such as knowledge, skills and innovative potentials, which are the key resources for competitive advantage (Brinkley, 2006). The three main driving forces behind knowledge economy are (i) globalization of labour, market forces and products across distant locations, (ii) information/knowledge explosion where efficient production relies significantly on knowledge that use more of the heads than hands and (iii) networking and connectivity developments such as the internet which has made the world a global village.

Some major indicators or hallmarks that distinguish knowledge economy from traditional economy show that;

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- The effect of location is diminished: they use appropriate technologies and methods, virtual market places and virtual organisations that offer benefits of speed and ability, of round the clock operation and of global reach

- Human capital competencies (intellectual asset) are emphasized as key components of value in knowledge-based companies (skyrme, 2008).

- The knowledge economy organizations re-organize workers to allow them handle, store and share information through knowledge management practices

- knowledge economy has a high and growing intensity of ICT use by educated knowledge workers and

- A growing share of gross domestic products (GDP) is devoted to knowledge intangibles.

3.2 Knowledge Management and Knowledge Management Activities

The concept and idea of knowledge economy accelerated the growth and development of knowledge management (KM). The term has attracted various definitions from scholars in different fields. However, any comprehensives attempt at its definition must take into account the two types of knowledge (explicit and tacit).

Ajiferuke (2003)'s definition therefore suffices. According to him, knowledge management involves the management of explicit knowledge, that is, knowledge that has been codified in documents, databases, webpages etcetera, and the provision of an enabling environment for the development, nurturing, utilization, and sharing of employer's tacit knowledge, that is "know-how", skills and expertise.

KM is a systematic process of taking advantage of intellectual capital and knowledge assets in order to promote organizational success. Knowledge management practices in general describes how organizations track, measure, share and make use of intangible assets such as an employer's ability to think and react quickly in crises. The key management practices are creating knowledge sharing culture, providing incentive policy to retain employees and alliances for acquiring knowledge and written knowledge managements policy. Neilson (2006) draws attention to the connection between different knowledge management activities like knowledge creation, acquisition, capturing, assembling, sharing, integration, leverage and exploitation. Through these activities organizations discover new knowledge within the organization as well as from outside the organization that not only enhance knowledge capabilities but also enrich the entire organizational knowledge assets.

Neilson (2006) further identified 3 dynamic capabilities of (i) knowledge development (ii) knowledge (re)combination and (iii) knowledge use. It is the interplay of these dynamic activities starting from creating or acquiring new knowledge, sharing /exchange and ending with its exploitation/reuse that propel and guarantee innovation and transformation in organization and institutions.

From here, let us attempt to situate libraries and their institutional repositories in the KM process to see how they are positioned to capture, store, preserve, exchange, and share and use knowledge to create value in the knowledge economy continuum.

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3.3 Libraries/Institutional Repositories and the Knowledge Economy

The fundamental questions or issues here are how do we define and situate library repositories to meet the demands of the knowledge economy. Put differently, what roles do libraries/institutional repositories play to enhance and sustain knowledge economies of their organizations or institutions? Our concern is with institutional repositories that have emerged and which have the dual mandate of not only serving their specific institutions but also other organisations that own and use them to achieve their mission and goals. Fundamentally, both industries and societies are end beneficiaries of the skills and expertise acquired from knowledge repositories. This therefore justify the role knowledge repositories play in the knowledge economy enterprise.

Libraries of today, out of necessity have become hybrid as they now combine both print collections and electronic or digital ones. Libraries are also increasingly not being seen as isolated institutions outside their environment but active constituent of a world network of information sources. It is a product of inter-thematic and inter-sectoral approach of collaboration among libraries and people transcending geographic and other materials or mid frontiers (Tsimpolou, 2017).

Knowledge management has become the buzzword in key part of modern libraries. Libraries are seen as integral in the knowledge ecosystem strategies. A library' status is no longer being defined by the collection it houses but extended to include online and seamless access to information resources packaged in institutional repositories. Thus institutional repositories have become the nexus of managing information in libraries.

3.4 Institutional Repositories in Libraries

An institutional repository (IR) can be defined as the digital preservation of the intellectual output of scholars in an institution that is accessible to inquirers and researchers worldwide. It is online, interactive and has capacity for growth. Westrienen and Lynch (2005) assert that IR is most essentially an organizational commitment to the stewardship of the digital materials, including long-term preservation and facilitating access to digital asset. Drake (2004) states that IR are created to manage, preserve and maintain the digital resources, intellectual output and histories of institutions.

Essentially libraries and librarians in this era as in the past are faced with the problem of how to use emerging technologies to manage information resources acquired or created for optimum use to the benefit of their institutions and fulfilling their roles as experts in collecting, describing, preserving and disseminating information resources. These traditional roles of libraries are today redefined and strengthened by the establishment of institutional repositories Akintunde (2010) summarize the 4 main objectives of IR to include:-

✓   To create global visibility for institutions scholarly research.

✓   To collect content in a single location.

✓   To provide open access to institutional research output by self-achieving and.

✓   To store and preserve other institutional digital assets, including unpublished or otherwise easily lost (grey) literature (e.g., theses, technical reports, etc.).

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3.5 Role of Librarians in Knowledge Repositories Management

Librarians will continue to serve their traditional roles of acquiring, processing, organizing**,** disseminating and storing both print and non-print materials. What roles will they play in a new or changing and incessantly networked information environment? To build an effective technology driven library it is imperative that the librarian must collaborate more with personnel from other departments of the institution. He must be a part of the wider institutional infrastructure committed to furthering new educational and learning approaches.

Urhiewhu, Okeke and Ejedafiru (2015) Summaries roles and skills of librarians for knowledge management to include:-

- ✓ Developing programme for library user of all ages and background
- ✓ Building collections to respond to changing community needs or demands.
- ✓ Creating pathfinders.
- ✓ Digitizing collections for online access.
- ✓ Managing access to electronic information resources etc.

In addition to organizational and interpersonal skills, new librarians requires.

- ✓ Strong IT skills and familiarity with the use of databases and the internet.
- ✓ Team working and management skills.
- ✓ Assessment of resource and library users need.
- ✓ Presentation and verbal communication skills.
- ✓ Subject-specific knowledge or expertise in a particular function, e.g. ICT resources or resource ordering.

3.6 Critical Factors in Managing Knowledge Repositories

3.6.1 Human Capital

This is a very critical factor in organizational knowledge. Human capital consists of competencies, skills, and knowledge and information possessed by the workers of any organization or institution. The role of human capital is not only limited to the idea generation but rather its role is also important during the distinctive idea execution to deliver the innovative product and service to customers (Akran, Siddiqui, Nawaz, Ghauri, & Cheew, 2011). People according to Edwards (2011) constitute 70% of the entire component of KM. It is important that they are guided and coordinated effectively to enhance institutional performance. Knowledge sharing forms the basis of any knowledge management programs and activities.

Nonaka and Takeuchi (1995) stressed that knowledge increases when it is shared. Thus organizations and (Institutions) seeking performance gains must consider dedicating a significant amount of efforts towards fostering employees learning and sharing behavior. Igwebuike, Oyekweodire and Agbo (2015) identified three major approaches to enhance employee knowledge sharing within organization as:-

- A Technology based approach in which technologies are considered the facilitators of knowledge sharing practices within organizations.

- An incentive-based approach in which momentary and non-momentary reward promote knowledge sharing practice and

- An organizational-based approach in which structures, processes and management style simplify the application of knowledge sharing practice (Hsu, 2006).

Bartlett (2016) sums it up when he states:-

"Book, journal, and technology are key components of any modern library, but a library' most valuable asset is its staff. Providing platforms that can capture the knowledge and expertise of your staff and facilitate communication and professional development among them, is an investment that will build in value over the years".

4. The Information Technology (IT) and Infrastructure Factor

Technology tools are indispensable and constitute the major driver of all processes in the knowledge management cycle starting from the creation, organization, storage, exchange, sharing, dissemination and preservation. Computers and internet connectivity are an unavoidable essential in KM implementation in every organization.

A number of platforms have been created to support institutional repositories. The availability of open source software (OSS) has accelerated their development. Some software packages for creating repositories include:- FEDORA, E-prints.org, DSpace, ARCHIMEDE, Mycore and I-Tor. From my clime, DSpace developed by MIT libraries and HB Labs has remained the most preferred. Other relevant software for creating knowledge bases cited by Bartlett (2016) include-Google Drive, Wiki Software, WordPress, Microsoft Sharepoint and Springshare's LibAnswers.

Kuwari and Narasimhaiah (2016) citing Maier (2002) classify other IT tools used in knowledge management based on the functions they serve in the knowledge system. These are:-

- The input function of publication, structuring and linking as well as integration of knowledge from external sources-publication, classification and cross reference.

- The output oriented function which include search and retrieval as well as presentation of knowledge. These groups are supported by infrastructure functions categories as communication/cooperation and administration and

- Imparting knowledge which mainly consists of e-learning and related concepts.

Issa, Sadiku, Olarongbe and Igwe (2015) on their part categorized these support technologies into 2 groups as (i) Asynchronous Groupware:- Email, Newsgroups and mailing list, Workflow systems, Hypertext, Group calendar and Collaborative writing system and (2) Synchronous or real time groupware:- shared Whiteboard, Video Communication Systems, Chat systems, and Multi-player game. Groupware after significant advantage over simple user system because they support larger collaboration, enable telecommunicating, form group with common internet, safe time and facilitate group problem-solving among other.

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4.1 Funding

This is the bedrock of every organization. Funds are required for the procurement of IT infrastructure, equipment and services. Payment for wages, training and retraining programme for staff. Funds are also needed to sustain operational cost, for upgrading and maintenance of equipment and facilities. New models found in open source initiatives and networking/ consortia arrangements and other alternative sources of self-help have become compelling options.

4.2 Key Issues in Knowledge Management in Repositories

The challenges confronting the development and maintenance of institutional repositories are legion. Modern libraries are dependent on technologies which are diversified in product and services. It is difficult if not near impossible to keep track with new advances and development in the field. The problems of keeping pace with or how to overcome technological obsolescence is real. This challenge is compounded by the ever scarce and dwindling resources available to cater for growing resources required, infrastructure and services. Developing and low income nations especially face critical challenges such as:-

- Lack of funds to equip and maintain hybrid libraries

- Lack of institutional and administrative support for staff training and development especially in ICT-based skills.

- Lack of basic infrastructure such as regular electricity supply, computers, internet connectivity.

- Disproportionately high cost of bandwidth which makes it difficult to connect and sustain internet connectivity, expensive IT equipment.

- Poor communication equipment/infrastructure

- Ignorance of consortia and other cooperative networks benefits

- Lack of skilled and trained man power.

- Digital illiteracy and underutilization of existing technologies etc.

5. Conclusion

We have attempted to define the concepts of transformation, information, knowledge, knowledge economy and knowledge management systems. The place of knowledge repositories especially in Libraries as critical agents in the knowledge management activities was underscored. Critical factors in running repositories as well as basic issues in their management were equally touched. To facilitate the implementation of knowledge repositories, a well-defined operational policy and management system must be put in place taking into consideration the realities of high cost of technologies and skilled personnel since human factors are vital in diffusing knowledge in institutions/organizations. Limited by funds, technologies, personnel and space, libraries must analyze and prioritize their need and seek to develop cooperative acquisition plans and as well take full advantage of open source initiatives.

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