



Digital Archiving Concepts, Social Context, Principles, Processes and Technologies: A Review of Literature

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Abstract

Digital archiving which emerged fully in the 21st century has become a compulsory support for digital recordkeeping in governments and digital publication in the academia. The importance of digital archiving in this era among archivists, librarians and information scientists cannot be overemphasized as it is yet to gain the required attention in this era's professionals' discuss. It is against this backdrop that this paper delves into the literature review of digital archiving concepts, its social context, principles, processes and technologies associated with this phenomenon. Some of the processes of digital archiving discussed include: selection, acquisition, description, preservation, reference and access, infrastructure. Under technological platforms, Lots of Copies Keep Stuff Safe (LOCKSS) and archival images formats such as Tagged Image Format (TIF) Portable Network Graphics (PNG) are explained. Challenges of electronic data preservation were brought to the fore as well. The paper concluded with emphasis on the importance of digital archiving and the need for libraries to acquire the pre-requisite infrastructure and skills for application and effective service delivery.

Keywords: Digital Archiving, Libraries, Archival Resources, Electronic Data, Preservation Technologies

1.0 Introduction

The term 'archives' is a plural word that refers to both a type of repository and the written materials held there. Technically, these are the records of enduring value of an institution, but the phrase has also come to embrace manuscript collections of personal papers. Digital archiving, according to Galloway (2010), is the practice of preserving (long-term or indefinitely) authentic digital

cultural objects for present and future use, is based theoretically in archival science but draws its technological support from many areas of the computer and information sciences. The concepts that inform digital archiving are drawn from multiple fields, but central to the practice those of archival science. Digital archiving is not worth very much if the objects archived cannot be trusted for their genuineness. Archival science bases

its concept of authenticity on the requirement to know the provenance or source of an object, analyzing documents and collections using the diplomatic questions who, what, in what manner, with what support, why, where, and when – in other words, establishing the context of creation and the subsequent history of the object itself, including its history while in archival custody (Lavoie 2004).

For digital archiving, some researchers have been trying to reframe these concepts in terms of automated metadata creation and harvestings, which has led to the assertion that archiving a suitably authentic record requires archival intervention in the design of record keeping systems. But clearly the digital archives are charged with retaining the original bitstreams of digital objects unchanged since they were committed to archival custody or supervision. Digital archiving carries with it also the necessity for preserving and providing usable forms of digital objects so as to present to future users at least the significant properties or affordances of the original object that have been judged important to the object's character. Hence in addition to the original bitstream derivative use, copies are often created for digital archiving. It is based on this background that this paper seeks to review the basic concepts, social contexts, processes and technologies associated with digital archiving.

1.1 Objective of Digital Archiving

Digital archiving is different from traditional archiving. Traditional archiving practice seeks to preserve physical objects (e.g., artefacts, samples, paper, photographs, microfilm) that carry information. Digital archiving seeks to preserve the information regardless of the media on which that information is stored. Computer disks and other magnetic and optical media degrade, and the information on them is lost unless it

has been moved to other media. Software and hardware change rapidly: the physical media on which digital data are stored are impermanent. Other methods are necessary to ensure wide access to and long-term preservation of digital data. Hence, the overall goals of digital archiving include:

- Permit easy and wide access to digital archaeological data for cultural, educational, and scientific purposes.

- Ensure the long-term preservation of digital data so that it remains accessible for appropriate uses in the future.

Digital archiving has become synonymous with digital preservation. No wonder Feather and Sturges (2003) asserted that digital archiving is the preservation of digital documents for future use. They stressed that digital media are dependent on the availability of software and hardware through which the content can be read, so long-term preservation is now conceived in terms of continuous refreshment of selected files so that they are compatible with currently available equipment and systems.

2.0 Literature Review

2.1 Social Contexts of Digital Archiving

Archiving tends to be an institutionalized and large-scale practice, situated under the control of social institutions like governments, educational institutions, and religions, the only kinds of institutions with enough power, funding, and motivation to guarantee persistence over a significant period of time. Investigation of digital archiving has therefore so far been undertaken primarily by governments and educational institutions. The transition to computer-supported work and communication in the 1980s made paper record keeping insufficient to support the accomplishment of government

aims and educational institutions' needs to preserve research materials and interest in opportunities for research into the archiving process itself. But as a 2007 report for the Dutch Koninklijke Bibliotheek points out, the internationalization of scientific publication and communication points to the future likelihood that digital archiving may become an internationalized cooperative effort (Hoorens, Rothenberg, van Orange, van der Mandele and Levitt2007). That report also mentions possible risk that dependence upon a large-scale but restricted set of digital repositories, controlled by governments and perhaps outsourced to private contractors, might call the trustworthiness of digital archiving into question.

According to Galloway (2010) efforts so far toward digital archiving have been differently focused depending on which of the institutions of memory aims to undertake it. Libraries primarily hold published materials that exist in many places in multiple copies. As they moved to digitize their non-digital holdings, their concerns were initially for access together with preservation of the original physical object. Hence many of the same features as digital archives, have been less concerned with provenance (which the digitizer after all controls) and the long-term preservation of the digitized bitstream. As libraries increasingly acquire digital-original materials like books and journals, however, it must be archived in order to perpetuate its research value. At a minimum, digital libraries must at least provide some sets on which scholars significantly depend. Archives' holdings, on the other hand, have always consisted of unpublished, unique objects, so they are primarily concerned to preserve original objects for as long as their remit demands – in many cases.

Digital archiving thus represents a superset of digital librarianship, but both librarianship and archival science have supported important work has contributing to

digital archiving its traditional concentration on discovery and access and its broad influence in literate countries. Significant national library initiatives have been undertaken by the National Library of Australia; by the British Library and related organizations in the United Kingdom; by the KoninklijkeBibliotheek in the Netherlands; by the Library of Congress in the United States; and by the European Union as a whole. The strengths of the archival world in this effort lie some cases over millennia and their very long term perspective. National initiatives in the archival field, clearly accountability of government digital recordkeeping, have been carried out by Archives Canada; by the National Archives and Records Administration in the United States; and by the British National Archives.

The importance of a combined view including both library and archival perspectives cannot be overstated. Considering the move to mass digitizing by both in order together with the fact that both research libraries and archives now receive into their holdings digital-only materials that cannot have a non-digital representation, it is fields in some way. At present it seems that the library field is still concerned with preservation in the short and medium terms only (Kenney, Entlich, Hirtle, McGovern and Buckley 2006). However, while most archives other than governmental ones are still primarily concerned with looming backlogs of non-digital materials.

2.2 The Principles of Archiving Digital Data

The points below raised by Niven & Thompson (2011) present an outline of the key issues to be considered when creating a digital archive.

Ensure that existing digital data are safeguarded and deposited in an appropriate digital archive.

When creating a new digital archive, ensure that it conforms to existing standards and guidelines on how data should be structured, preserved and accessed.

All digital archives should ideally be deposited in a digital archiving facility or collections repository where they can be properly accessed, curated, and maintained for the future.

The key to successful digital archiving is thorough documentation of the data, how they were collected, what standards were used to describe them and how they have been managed since collection.

If there are concerns that some data (e.g., specific site location information) needs to be kept confidential (as required by the Archaeological Resource Protection Act (ARPA) in the US), a means of easily separating these data from non-confidential data must be developed for reports, analytical datasets, and for displaying site locations on maps. It is also essential that this process is documented and deposited as part of the archive.

There is generally no need to preserve interim versions of final digital files. Exceptions to this include interim datasets where either data or text is subsequently discarded or decimated to final publication.

Data already held safely in paper archives do not need to be digitised, except to provide a digital security copy or online access to the data. When digitising or scanning from paper records, do not automatically discard the paper originals when complete. Offer them to relevant documentary archives.

Although the digital, paper and archaeological resource archives may be dispersed, the integrity of the complete

archive must be ensured by cross-referencing between physical collections and digital records.

In accordance with the principles presented above, digital archives should at least provide an index to archaeological sites, finds and paper archives and at best provide access to digital records of data, material, documentation, interpretation and analyses. It is recommended that the collection or creation of digital datasets be planned at the outset of a project and incorporated into project scopes of work and specifications. It is recognized that funding agencies must acknowledge such requirements if widespread implementation is ever to be achieved.

2.3 Digital Archiving Processes

It is worthy of note that the Open Archival Information System (OAIS), which is the reference model for a trusted digital repository worked out by the National Space Science Data Center), became ISO standard 14721 in 2002. According to Consultative Committee for Space Data Systems (2002) the OAIS reference model frames the functions that such a repository should support; these include ingest process, data management, archival storage, administration, preservation planning, and access, and each of these is further subdivided to include subtasks. In addition, the model envisions an environment in which both the “producers” of materials to be archived and the “designated user community” for whom they are being archived will be explicitly considered by the overall management of the repository.

According to Lavoie (2004) the reference model is not a repository itself, but a kind of boundary object which has become a basic reference point for discussions of digital archiving by most library and archives communities, including those interested in preserving scientific data, business assets, government recordkeeping, and cultural

resources. Several repository software systems have been developed that adhere to its features, in both the open-source arena (DSpace, Fedora, DAITSS) and commercially (IBM's DIAS). Additional efforts beyond the original reference model document have included a substantial document detailing the ingest process and an ongoing project to define the requirements for certification of compliance both to the OAIS requirements and to further requirements for a "trusted digital repository" (Ambacher 2007). The mandatory responsibilities outlined in the OAIS model, listed below, clearly mirror in significant ways the basic archiving steps recognized by the archival community as core responsibilities, added in square brackets. These steps are highlighted by Lavoie (2012) as follows:

1. Negotiate for and accept appropriate information from information producers [appraisal and selection].
2. Obtain sufficient control of the information to meet long-term preservation objectives [acquisition].
3. Determine the scope of the archive's user community [management].
4. Ensure that the preserved information is independently understandable to the user community, in the sense that the information can be understood by users without the assistance of the information producer [arrangement and description].
5. Follow documented policies and procedures to ensure that the information is preserved against all reasonable contingencies, and to enable dissemination in its original form, or in a form traceable to the original [preservation]
6. Make the preserved information available to the user community [reference and access].

In fact the authors of the OAIS model have indicated that there is no reason that the model

cannot support physical archives as well as a digital one – or indeed a museum containing non-textual objects. At the same time, the details practice to fit digital affordances that non-digital objects lack, and as such they have challenged archival thinking significantly, as witness a 2006 assertion by the president of the Society of American Archivists, Richard Pearce-Moses, that the tasks performed by archivists remain the same in spirit, but how they are done must change with respect to digital records (Peace-Moses, 2006).

2.4 Selection of Digital Objects

Whereas it seems fairly straightforward to apply traditional archival practices to the selection of digital objects that look and apparently behave like paper ones, the situation is not nearly so clear when it comes to objects whose affordances cannot be rendered on paper. E-mail can certainly be printed out, but in doing so much of its metadata and all of its manipulability will be lost. Static Web sites consisting of multiple pages, each of which contains all of the material to be displayed, can also be captured after a fashion through screenshots and source code, but this no longer the case with dynamic Web sites that may draw materials from many servers and whose content may primarily come from a dynamic database that is constantly updated. Finally, to move to the extreme end of the spectrum of complexity, persistent virtual worlds like those of videogames and collaboration spaces consist not only of visible structures and programmed characters or functions, but of the activity of players or participants interacting with one another, and none of this can be rendered to any useful degree on paper (Botticelli, 2000).

Just as it is extremely useful in the physical world to have people with subject expertise help select materials in those topics, it is also very useful to have people who can be considered experts help select digital resources. The Web is only a delivery

mechanism, so it makes no more sense to have systems personnel or low-level staff choose electronic resources than it does to have them select paper journals and books in subjects they lack expertise on.

2.5 Acquisition Process of Digital Materials

The acquisition process for digital materials follows several by now well-defined general steps, modeled to some degree on conventional archival practice. As a result of an appraisal process that a set of digital materials is desirable; the digital archives must arrange to negotiate with the creating entity what will be transferred, how it will be formatted, and what kind of metadata will come with it; in OAIS terms, this is negotiation of a Submission Information Package (SIP) agreement. It assumes that as has been the accessioning of the materials into the digital archives.

There is another approach which has been instantiated in so-called institutional repositories, digital libraries, or archives created initially by universities to capture and highlight the intellectual output of their faculties. Thus although adhering to the OAIS framework, the DSpace repository software was intended by Massachusetts Institute of Technology (MIT) to serve it as an institutional repository for the digital materials produced by its academic departments and research institutes. It was assumed that each of these units would have self-archive their materials, while the university library would attend to cataloguing and more complex technical tasks.

The process of ingest was very simply described in the original OAIS document, which left preprocessing steps to the records creators. The results of the deployment of institutional repositories have shown that digital self-archiving, in the absence of built-in repository software that adds ideal metadata on creation and ingest processes that

automatically vet the materials submitted, still requires additional activity by digital archivists to deal with these issues. Research is ongoing to move the automated interface between repository and creator closer to the creator.

2.6 Description of Archival Materials

As Galloway (2010) observed, where the materials in question are textual, it is possible to know in far great detail than describers of paper records could what exactly is to be found in the records themselves. What this means for digital archiving is that although the digital archivist does take care to recover the arrangement of the materials in their native system context as seen and used by the creator (by recovering, e.g., a record of the original file system listing of the files – itself of course a virtual view), it is not necessary to preserve the digital materials in their original order as long as that order can be reconstructed for use. It is even possible to do what archivists could not do without copying whole collections, and that of a collection to enhance its research use. In addition, search engines are already being used to allow users to drill down into collections to find just what they want, without concerning themselves with the overview of collection-level metadata unless they wish to do so.

Traditional archival descriptive practice has resisted these ideas until recently. In order to draw attention to paper collections, archivists in the 1980s began to create a markup convention, Encoded Archival Description (EAD), for the online presentation of finding aids (Piti & Duff, 2002). Although EAD is as extensible as its XML substrate allows and can well point directly to digital archival objects at the lowest level of its traditional hierarchical presentation, it is still seldom used to describe digital collections except where an existing institutional practice is in place. The fact is that even in the case of paper records, the

artisanal process of archival description of unique collections using a controlled descriptive practice as instantiated in one of the myriad standards such as Manual of Archival Description (MAD), UK; Rules for Archival Description (RAD), Canada; General International Standard Archival Description (ISAD(G)), etc. cannot benefit from collective cataloguing as books can, and this has been a major factor in the cost of accessioning archival collections.

2.7 Preservation of Archived Objects

Preservation of digitally archived objects has received much of the attention and project-based experimentation of archivists since the threat of a “Digital Dark Age” began to be apprehended. From the beginning archivists presumed that it was crucial to determine whether their duty to the preservation of public memory in digital form could even be carried out at all over the long term. In 2003, Spindler (2003) provided a list of seven challenges of “electronic record” preservation:

1. Physical degradation of storage media.
2. Physical obsolescence of storage media.
3. Incompatibility/noninteroperability of storage media.
4. Software, operating system, or encoding incompatibility/noninteroperability.
5. Human error/vandalism.
6. Backups and snapshots.
7. Metadata.

Although all of these challenges are still recognized, Rosenthal (2007) notes that numbers 1, 2, 4, and 5 above have been set aside as eminently solvable (and even solved) by existing information technology practices, while the remaining two, version incompatibility and metadata, have moved to the centre of preservation concerns (if not those of technology specialists).

Galloway (2010) further explained that since digital objects are mediated by

technology, changes in the technology can make them unavailable, and that fact is at the heart of the most intractable problem of digital preservation: the ability to render a digital object and make it available in the future beyond paradigm shifts in software and hardware function. Digital objects, whether logically conceived as arrays (text), matrices of arrays (tables), irregularly bounded arrays (sound, still and moving image), complex objects (complex objects with a temporally changing makeup), nevertheless are digitally represented as a sequence of bits, some of which (metadata, markup) may be used to indicate the nature of the object (s) so represented. With no indication of what the bits represent or how they are to be arranged to render the object, it is impossible to recover the object without extremely complex cryptographic techniques and the possibility of assuming that the object itself comes from a culture whose representational conventions are understood. For this reason proprietary and constantly changing software encoding schemes are the bane of the digital archivist, and obtaining at least limited access to them for archival purposes is considered compulsory in the long term.

2.8 Reference and Access

Regarding reference and access to digital archives Nguyen and Le (2007) observed that in physical archives, where patrons seek access to physical materials, archivists have traditionally considered that the finding aid must of necessity be reinforced by the expertise of the reference archivist. For this reason, apart from marking up finding aids in EAD to put them online, many archivists have tended to believe that they need to do more. Others, however, have learned from libraries grappling with the Internet and have moved to adopt both more uniform library-style cataloguing and, in the case of digital materials, have begun to experiment with providing greatly amplified

access to the resources themselves. Aggregating metadata from multiple repositories is being made easier and more detailed by the further development of the Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH) to support aggregations, and this work [Open Archives Initiative Object Reuse and Exchange (OAI-ORE)] is likely to have great usefulness for the fonds-based aggregates that digital archives are likely to produce (Van de Sompel, et al 206).

3.0 Technologies involved in Digital Archiving

Digital archiving depends on a broad range of information technologies, simply because it foresees preserving digital objects ranging in size and affordances from single files to entire systems and from simple ASCII encoding to complex dynamic multimedia objects. Because of the enormous size of the potential digital archiving task, it will be dependent on petabyte-scale storage management schemes, pioneered by the San Diego Supercomputer Center (Moore, et al 1996). Because of the need to identify and manage digital objects individually, automated metadata harvesting rather than handmade description is required for archival files. Since it is recognized that large-scale digital archiving will probably require significant redundancy in the face of potential risks, technologies like polled peer-to-peer integrity-checking among mirrored repositories are already being used by the Controlled LOCKSS consortium to guarantee the authenticity of replicated holdings (Reich and Rosenthal 2001).

3.1 Lots of Copies Keep Stuff Safe.

The acronym LOCKSS stands for Lots of Copies Keep Stuff Safe. The challenges of file size may be somewhat mitigated though the use of lossless data compression schemes, but once compressed,

resource discovery for text is dependent upon prior automated indexing, while indexing of images will be dependent on automated pattern recognition techniques. It is anticipated that new developments in digital technologies like information retrieval, data mining, and social network mapping will be used to find and reflect both original and emergent knowledge structures in digital archival collections.

The idea behind LOCKSS is simple – multiple copies of documents are stored at different libraries. Documents that have been modified can easily be detected and repaired because copies at the different libraries are constantly compared. If a discrepancy is found the different LOCKSS servers vote to figure out which copy is correct and the damage is automatically repaired. Because LOCKSS retains multiple copies of documents, backups are not necessary. LOCKSS has the support from major publishers and many libraries. However, LOCKSS is designed to ensure access to content that a library has purchased, and then it can only be used if the publisher has granted explicit permission.

3.2 Archival Image Technical Formats

Digital repository managers must understand the basic issues surrounding image resolution in order to make informed decisions about how digital resources will be captured. A number of digital archival formats can be utilized but fortunately, a great deal has been written about them over the past few years. A number of the resources discussing formats are listed later in the chapter, and these should be consulted for a fuller understanding of what image formats and techniques are available. A basic description of image formats is provided. There are two image formats used primarily for archival purposes and four image formats used primarily for displaying digital data. Reese and Banerjee (2008) describe image formats

for archiving purposes thus:

i). *Tagged Image Format (TIF)* – The TIF image format represents the current de facto digital file format for archival images. The TIF has become the digital archival master-image format of choice. In practice, the TIF file format is used almost universally by digital library projects around the world. A quick sampling of current projects like the Library of Congress, the U.S. National Archival Records Administration (NARA), the California Digital Library, and Stanford University all require the TIF format for all master images. In part, this choice comes from the technical make-up of the file format itself. The TIF file format is a 24-bit, lossless file format commonly used by nearly all image editors. This makes the format ideal for archival image digitization since the saved file always provides an exact digital representation of the digital artifact.

ii). *Portable Network Graphics (PNG)* – like the TIF format capable of creating archival images. Few use PNG as an archival image format, in part because the image format was designed primarily as replacement to the Graphics Interchange Format (GIF) image format. PNG was developed primarily in response to Unisys's decision to enforce a patent related to the compression format within the GIF image format. PNG was developed by the open-source community to provide a standards-based image format, superior to the GIF image format, but meeting the same need. As an archival format, the PNG image format is a lossless image format, but it is not widely supported as the TIF image format. As a result, the PNG image format is used primarily for the creation of display quality images.

3.3 Infrastructure for Digital Archiving

Generally, Information Technology (IT) infrastructure consists of a set of physical

devices and software applications that are required to operate the entire enterprise. But IT infrastructure is also a set of firmwide services budgeted by management and comprising both human and technical capabilities (Laudon and Laudon 2010). The infrastructure that must be provided for digital archiving will be managed locally but for effective use must be interoperable. The repositories themselves will likely not be based upon the same software for reasons of risk, but they must respond to the same standards, including those required for managing Internet Protocols (IP) commitments, authentication for access, and certification of such interoperability. IP commitments are not the only requirement for which metadata standards must be supported by repository architecture; metadata standards are needed, as we have seen, to support resource discovery, complex digital object structure, provenance/context, preservation, and even usage records (Lavoie & Gartner, 2007).

Conclusion

The process of acquiring archival materials is much simpler if the desired resource in question is a single document, even if all that is needed is an individual document stored or archived in a normalized format. Especially for resources consisting of many files, written detailed procedures will be needed as to allow staff have the ability to normalize and ingest materials into the collection. This normalization and ingestion process may be automated, but some materials may need to be downloaded, reformatted, or have other procedures performed on them manually.

From the discussions, it is clear that Digital Archiving is a growing trend in the archival, library and information services today. It has brought about access to resources that were inaccessible because of their original manual nature. Libraries can latch on

to the global trend by carefully studying the practices, processes and technologies associated with digital archiving. The challenge, however, may be the lack of adequate infrastructure as well as lack of necessary skilled human resources to support the technology that digital archiving requires.

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Managing Generational Diversity in the Workplace: Implications for the Digital Era University Library Management

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Abstract

For the first time in recorded history, four generations are working side by side in the workplace: the Matures, Baby Boomers, Generation X and Generation Y. While having a generational mix adds diversity to the workforce, it can also set the stage for potential conflict and complications. Because each of these generations is at a different stage in their life cycles, they have very different needs, values, and attitudes. Organisations, including university libraries, often view generational differences as inevitable, unavoidable, and abstract; but research shows that in the 21st century, organisations that proactively address these issues will be more successful than those that do not. It can also give them competitive advantage by ensuring a transfer of knowledge. Good working relationships between older and younger employees will help make sure that this knowledge is not lost. This paper therefore discusses the four main generations that make up the workforce of the University Library, highlights their individual differences and unique characteristics and suggests ways in which university libraries can motivate and manage these very different age groups in the workplace. The paper concludes that managers of university libraries should leverage the significant shift in societal demographics to build better and more relevant products, create more attractive work environments, and recruit better talent. This would lead directly to customer satisfaction, and then to societal appreciation of the unique position of the university library in current digital era.

Keywords: Generational Diversity, Management, University Library, Workplace, Digital Era.

1.0 Introduction

The workplace has always represented a melting pot of ages and life stages. It is

nothing new to find different types of employees in the workplace with conflicting communication styles, opposing values, and

preferred ways of doing business working shoulder to shoulder. The face of diversity today in the workplace is multi-faceted (Crampton & Hodge, 2009). Today's workforce is more diverse than ever, and more complex to manage. Walking into any contemporary work environment, one is likely to find multi-generations working side by side. What is new, however, is that this represents the first time that we have four distinct generations — Veterans (born pre-1946), Baby Boomers (1946-1964), Generation X (1965-1980), and Generation Y (born post-1980) — in the office simultaneously. This phenomenon cuts across the different sectors and professional groups in the society.

It is therefore not surprising that in recent times, generational workforce in the workplace has become a topical issue among university library professionals and other scholars in Library and Information Science (LIS). With an age gap of about 65-70 years between the oldest and youngest employees in some organisations, there is a broad range of perspectives, needs and attitudes floating around the workplace. Today's workplace therefore is most definitely a multi-generational one – and each generation has its own set of expectations, needs, values and working styles. **A posting in an online database revealed that sociologists, psychologists, and everyday managers have identified important differences between these generations in the way they approach work, work/life balance, employee loyalty, authority, and other important issues** (<http://www.multiculturaladvantage.com/recruit/group/mature/Generational-Diversity-in-Workplace.asp>).

2.0 Literature Review

2.1 Definitional Concepts of Generations

Hanna (2009) defines generations as cohorts with similar values and beliefs which

affect the way they communicate. A generation, according to Notter & Cagner (2005), is a group of people defined by age boundaries—those who were born during a certain era. For Dupree (2009), a generation is a group of people defined by age boundaries who were born during a certain era and share similar experiences and social dynamics when growing up. They share similar experiences growing up and their values and attitudes, particularly about work-related topics, tend to be similar, based on their shared experiences during their formative years.

The Traditional generation is the oldest generation in the workplace, although most are either retired or preparing to do so. Matures or Veterans are those workers who were born before 1946, and they respond best to managers who respect their experiences and knowledge as well as their place in the organisation's hierarchy. The next generation is referred to as the Baby Boomer, because of the extra seventeen million babies born during that period relative to previous census figures (O'Bannon, 2001). They were born roughly between 1945/6 and 1964, can be motivated with flexible work schedules and opportunities to learn new skills. On the one hand, Generation Xers represent those who were born approximately between 1965 and 1980. The term Generation X spread into popular parlance following the publication of Douglas Coupland's book about a generation of individuals who would come of age at the end of the 20th century. This generation was also called the 'baby bust generation', because of its small size relative to the generation that preceded it, the Baby Boom generation. Often, they prefer managers who allow them work independently, and they tend to place a high value on their personal lives. On the other hand, Millennials are those born after 1980. The lower limit for Millennials may be as low as 1978, while the upper limit may be as high as 2002, depending on the source (Campton & Hodge, 2006). In general, they share many of

the characteristics of Generation Xers. However, they like to have frequent feedback, often work best in teams, and tend to enjoy working with the latest technologies. The workplace being discussed in this paper is the university library.

2.2 Dealing with Diversities in the University Libraries

Dealing with diversity in the university libraries means, in part, understanding and relating effectively with people who have different backgrounds and idiosyncrasies. University library managers know that now, more than ever before, one management style does not fit all the sub-sets and circumstances. Each generation has different characteristics, traits, motivating factors, ambitions and work styles. The success of the university library is becoming increasingly dependent on the ability of the management to deal with differences along these identity lines. There is one particular aspect of diversity, however, that has been getting considerably more attention over the last several years. It is known as generational diversity. Beyond mere life stages, generational differences are based on broad variations in values that developed based on the contrasting environment and social dynamics each generation experienced as they were coming of age and becoming adults. In the workplace, these differences seem to be generating clashes around work/ life balance, employee loyalty, authority and other important issues. While generational diversity in the workforce promotes, as Collier (n.d.) suggests, a broader range of talent, it can often mean conflicting ideas and stereotyping – the Baby Boomers think Generation X needs a stronger work ethic, Gen X sees the Boomers as self-absorbed workaholics – and everyone thinks Generation Y is selfish and self-entitled. Predictions of generational conflict in the workplace are often based on anecdotal information. Organizations must come to the

realization that the workforce is becoming increasingly heterogeneous, and they must learn to manage a diverse pool of workers. In addition, organizations remained challenged in managing diversity at the individual and group levels as employees from different generational backgrounds remain uneasy with each other's values.

Workplaces such as university libraries are also finding themselves dealing with upside-down hierarchies in which Millennials and Gen Xers are managing older workers who perhaps because of stagnation or plateauing on one rank or those who may have rejoined the workforce after retiring on contract or beginning a new job or career after a layoff. This type of upside-down hierarchy can cause additional frictions. On the other hand, the blend of generations in the workplace can be a tremendous advantage. Blending Veterans' experiences and knowledge with Millennials' veracity, vitality, optimism and technical/ technological savvy can greatly enhance corporate bottom lines. However, in order to capitalize on these opportunities, management must first of all, learn to be “multilingual,” speaking the language of each generation, and finding out what they value, what motivates them and what their strengths and weaknesses are. The collective response to these has been a wave of research investigations. Researchers and experts in generational matters have explored ways and means of helping to educate management about who these generations really are and how they can recruit, retain, manage, fire, reward, and discipline them. An increase in the age and generational diversity in the workplace has prompted the exploration of the ways in which employees co-exist and function. In today's university libraries, the dilemma of generational diversity appears to be centered on:

- (a) Baby Boomers retiring sooner or later,
- (b) Lack of effective intergenerational communication, and,
- (c) Intergenerational contrasting

characteristics and distinctive experiences.

In Nigeria, employment and retention of new and young workforce is problematic when older workers are not retiring or in any hurry to retire. This group of workers as Streeter (2007) opines, hangs on tenaciously to their positions by not yielding an inch in their place in the workforce, and planning to do so for years. In virtually all sectors of the country's workplace, Baby Boomers currently make up the majority of the workforce and this limits openings and promotion opportunities for younger employees. As a result, a situation like this is bound to create discouraging and negative attitudes between generations working together (Dychtwald, Erickson & Morison, 2006).

Ideally, an age-diverse workforce as **Maddell (2015) observes**, would result in improved collaboration, creativity, and decision-making. Yet, this ideal is far from reality in many workplaces. At the crux of the workplace generation gap lies widely divergent communication styles and preferences. One reason for this is differing experiences with technologies. Veterans and Boomers came of age in a world without computers, while Gen Xers got caught in the transition to workplace technology and Gen Y grew up fluent in it. These varying levels of technological savvy create various communication styles and workplace experiences that distinguish each generation. This can lead to negative impacts on workplace etiquette and communication and ultimately lead to conflict - which affects corporate harmony, productivity and profitability. With four generations working together and a present lack of understanding of generational diversity in today's workforce, there is bound to be disharmony within the rank and file. This situation may create dissent and tension and in the workplace.

There is, therefore, no doubt that intergenerational communication misunderstandings affect employee morale, commitment, productivity and staff turn-over. As more generations coexist in the workplace, there is a need for strategies that help them communicate more effectively.

Unquestionably, as DiRomualdo (2006) states, there are real differences, misunderstandings, and tensions among workers born in different eras. According to McNamara (2005), each generation has distinctive experiences and contrasting characteristics that impact on their values in the workplace, and each has complex cultural variations. Recognizing and understanding generational differences can help everyone learn to work together more effectively and transform the workplace from a generation war zone to an age-diverse and productive team. There is not much on current research that discusses strategies for harnessing the strengths, talents and creativity of the intergenerational diversity in the workplace. There is therefore, a need for more research on leveraging generational diversity in order for university libraries to run as smoothly and efficiently as possible. This paper has become imperative to address managing generational diversity in the university library as a pre-emptive measure rather than reactionary approach to the issue.

2.3 Generations in the University Libraries and Their Uniqueness

*Perhaps, for the first time in recorded history, organizations and labour markets in the 21st century are comprised of members of **four generations**. Known as Veterans, Baby Boomers, Generation Xers and Millennials, these generations have distinct characteristics, motivators, and values that influence their role in the workplace. This situation, according to Hornbostel, Kumar & Smith (2011) presents very real challenges – and opportunities - to university libraries and*

how they address issues of talent engagement, leadership development and people (i.e. human resource) management. To have a full understanding of the four generations that share our workplaces of which the university libraries is a part, it is important to discuss each generation and their characteristics.

i. Veterans (born between 1922 - 1945)

Veterans (also referred to as Matures) are people **born approximately between 1922 and 1943** or before 1945. They did not typically go to post-secondary school. Instead, they began working immediately after secondary school or military service with the express intent of finding lucrative positions to support their families. They grew up in tough economic times during the Great Depression and World War II. Veterans tend to value hard work. They are dedicated, not just to doing a good job or making themselves look good, but also to helping the library succeed and getting for customers/users what they need. Salaries and wages from a stable university management, not necessarily personal fulfillment, was the driving force for the Veterans. They came of age in an era in which it was typical for a person to work for a single organization until retirement. Loyalty to their university library is a prime value for Veterans. Their characteristics are listed as follows:

- loyal to employers,
- respect chain of command
- value experience in others and in themselves
- believe in the status quo
- have respect for authority figures.
- believe in the intrinsic value of hard work
- have a work ethic that hinges on loyalty,
- appreciate dedication,
- depend at a 'stick to it' mentality.
- are great team players and carry their weight and do not let others down.
- They obtain job satisfaction from the

work itself and from doing a job well and do not necessarily need the work to have particular meaning.

ii. Baby Boomers (born between 1946 – 1964)

Baby Boomers were born between 1946 and 1964. The Baby Boom generation has also been referred to as the “pig-in-the-python” (Callanan & Greenhaus, 2008). This generation is referred to as the Baby Boom, because of the extra seventeen million babies born during that period relative to previous census figures (O'Bannon, 2001). As the Boomers matured during the late 1970s and 1980s, they became known for prioritizing their careers and experiencing a high degree of stress in their personal lives as a result. They did not experience the same difficulties as their parents. They grew up during a time of great economic growth and prosperity. Their lives were influenced by the civil rights movement, women's liberation, the space program, the Cold War, and the Vietnam War. They place a high value on youth, health, personal gratification, and material wealth. Baby Boomers are optimistic and believe their generation changed the world. They grew up during an era of economic prosperity and experienced the tumult of the 1960s at an impressionable age. They are work-driven, love challenge and build stellar careers. Because they have had to contest with each other at every step of their careers, they can be highly competitive. Their children were the first generation of “latch-key kids” who had two parents working outside the home. Boomers tend to value personal connections among coworkers, put a lot of time and effort into their work, and expect their subordinates to do the same. Unlike Veterans, Boomers are not opposed to job-hopping if it serves their interests

The major characteristics of Baby Boomers can be summarized as follows:

- ✓ committed,
- ✓ hard working and career-focused – which

has caused them to be tagged as workaholics by Gen X and Gen Y;

- ✓ work ethic characterised by dedication, loyalty and a willingness to stay in the same job for a long time;
- ✓ have a lot to offer businesses with their work and life experience, skills and knowledge that many younger people can't offer;
- ✓ work longer hours – and respect is paramount when managing a Baby Boomer;
- ✓ regard 'career' as a linear series of upward moves;
- ✓ Seek status and feel success is important;
- ✓ largely employer-controlled and do not understand job-hopping;
- ✓ Have already achieved many of their career goals; and
- ✓ respond well to traditional methods of career development and to formal career advancement schemes linked to pay.

iii. Generation X (born between 1960 – 1981)

Gen X is sometimes referred to as the misunderstood generation. They are the product of self-centered, work-driven Baby Boomer parents. They encompass the lucky group of individuals born in the 60s but before the 80s really got underway. They were the first generation of workers to embrace the personal computer and the Internet. They welcome diversity, are motivated by money, believe in balance in their lives, are self-reliant, and value free time and having fun. Raised in an era of two-earner households, many of them got a child's-eye view of work-centric parenting. They represent the pop culture of the 70s and are often referred to as 'latch-key' kids (often left alone at home because both parents were working) – which explains their independent, resourceful and adaptable approach to work. Other noticeable

attributes of the Gen-Xers include:

- possess an entrepreneurial spirit, a do-it-yourself attitude;
- embrace change in the workplace;
- career-oriented but place a strong emphasis on family time and strive for a good work–life balance;
- enjoy freedom and autonomy – they work to live rather than live to work;
- flexible workplace is a must for a Gen-Xer;
- value constructive feedback – which both need to be taken into consideration when managing Gen X;
- seen to be in the best position in the job market at the moment as they are set to step up to the plate and fill the leadership roles when the boomers retire;
- Highly educated and have the qualifications to go with it;
- Brought up in an era of technological and social change;
- technologically savvy, open to change and eager to learn new skills;
- possess a different work ethic to the boomers;
- constantly assessing how their careers are progressing and place a premium on learning opportunities; and
- thrives on diversity, challenge, responsibility, honesty and creative input, compared to the boomers' preference for a more rigid, work-centric approach.

iv. Generation Y (born between 1980 and 2000)

As the newest generation of workers blazes a trail into university libraries, so has a new lexicon hit newspapers, boardrooms, and dinner tables to characterize the Millennials (also known as Gen Y) and describe their impact on workplace dynamics. There are many labels associated with this generation. Presently, according to Tolbize (2008), they

are identified as Millennials, Nexters, Generation www, the Digital generation, Generation E, Echo Boomers, N-Gens and the Net Generation. On their part, members of the generation have labeled themselves as the Non-Nuclear Family generation, the Nothing-Is-Sacred Generation, the Wannabees, the Feel-Good Generation, Cyberkids, the Do-or-Die Generation, and the Searching-for-an-Identity Generation. Practically born with a mobile phone strapped to their ear and a laptop in their cradle, this generation is totally comfortable with digital technology. Excellent multi-taskers – they have had to juggle school, soccer training, dance class, computer games and other social interests, all whilst sending text messages – they are impatient and require instant gratification as they have always had all the information they need at their fingertips via the Internet. These new employees are seen as “special, sheltered, confident, team-oriented, conventional, pressured and achieving”. Accordingly, Howe & Strauss (2000) - who coined the term “Millennial”, in addition described them to be “high maintenance and high risk” and can also be “high output”. They want to work in an environment where differences are respected and valued, where people are judged by their contributions and where talent matters. Their characteristics include:

- ❖ Shaped by parental excesses, computers and dramatic technological advances;
- ❖ Comfortable with technology. Shares many of the characteristics of Xers;
- ❖ Value team work and collective action;
- ❖ embrace diversity and are always optimistic;
- ❖ adaptable to change and don't expect to stay in a job too long;
- ❖ seek flexibility and independent and require frequent feedback;
- ❖ desire a more balanced life and want clearly stated goals;
- ❖ multi-taskers and want state-of-the-art

technology;

- ❖ the most highly educated generation;
- ❖ value training and want to be challenged;
- ❖ Expect close and frequent contact with supervisor;
- ❖ demanding and as the most confident generation;
- ❖ Expect to be paid for what they do, not how much time spent;
- ❖ Want to be at top of chain right away; and
- ❖ Like Xers, they are also entrepreneurial, and less process focused.

Each generation brings different needs, behavioural traits, values and perspectives to the workplace. This in turn impacts what they need to be satisfied, loyal, aligned and involved with their organizations – and ultimately, how they can be encouraged to contribute new ideas and to embrace an innovative culture.

3.1 Managerial Challenges of Generational Uniqueness

When it comes to managing cross-generational groups, each new generation has taken its turn as the workplace whipping boy. Veterans criticized Boomers as “anti-establishment,” but when Xers entered the workforce, Boomers labeled them “slackers.” Now, previous generations point to Gen Y as the problem, labeling them “divas” - who have a sense of entitlement. Nicole Lipkin, author of *Y in the Workplace: Managing the “Me First” Generation* has coined this type of complaining “**gencentristism**,” which she believes is the most negative outcome of a multigenerational workforce. In defense of its group, each generation in turn claims the labels are unfair and inaccurate. The most recent defense comes from Gen Y proponents, including Gen Xer Shannon Kelley, co-author

of *Undecided: How to Ditch the Endless Quest for Perfect and Find the Career — and Life — That's Right for You*. According to Kelley, “what older generations might call entitlement, I would call bewilderment. They are used to getting gold stars just for showing up, and are baffled when a workplace does not hand them out.”

3.2 Challenges of a Multigenerational Workforce

A multigenerational workforce is not without its challenges. Each sector or establishment contends with its set of challenges arising from the generational distribution of its workforce. In the University Library, many challenges confront management in getting all four generations to understand the different ways they approach the workload. For instance, it is fashionable for younger workers like Gen Y to walk into the library with ear piece/buds glued to their ears. They care less about dress code for workers in a service industry. Sometimes, they tuck their hands into their side pockets while talking to their supervisors. Management has to deal with these directly since the ear buds, irregular dressing and their mannerism could inflame the veterans or boomers who cannot embrace or even tolerate ear buds to work or engage in multi-tasking. Similarly, another challenge lies in library management finding ways to set collective norms based on values that transcend generations. Each generation has, among others, different contexts with how library meetings will be run, what work schedules will be adhered to, and how decisions will be made. If the university library cannot identify common grounds, frustration among generations is inevitable. Even in recruitment of new workers, an unfair hiring practice is also an area of intergenerational challenge. When in a hiring role, Gen Xers look to those they are comfortable with in age and

background. This is a generality, but reflects the common theme that is becoming apparent by out-of-work Boomers. For library managers responding to generational differences and conflicts requires the same skills needed to deal with other diversity issues such as: awareness, communication and ability to manage conflict productively.

Young people, especially Generation X and Y - described by Prensky (2001) as *Digital Natives – may be newcomers to the world of work, but it is their bosses- Veterans and Baby Boomers* also described by Prensky (2001) as *Digital Immigrants, who are new into the digital world, argues Rainie (2006)*. In the workplace, it is normal to find Generation *X and Y* today who have high speed Internet access at home, access to all manners of computers, laptops or note books, tablets of their own, a variety of cellular telephones (capable of texting and taking photos and short movies) such as I-Pad, Android, Blackberry, Samsung Galaxy and an I-Pod or other MP3 player. Morgan (2012) posits that these new generation workers by their nature possess a number of common traits that can be tough to manage, especially if management's exposure to this generation is limited. If, for instance, Baby Boomers find themselves supervising *Generation X and Y* in the library workplace, such as a team of web developers or internet marketers, then the common traits prevalent among them that management need to be aware of include:

Generation X and Y exhibit a sense of entitlement and are not used to having to wait for what they want, the digital generation can exhibit what feels like a sense of entitlement that is less common in preceding generations. This can make expectation of library management difficult.

Generation X and Y have trouble accepting authority, especially, from digital immigrants going by the fact that they display superior

capabilities and knowledge in their field of expertise when compared to their managers, many **Generation X and Y** struggle to accept the authority of their managers.

Generation X and Y find any imposed limits or constraints difficult to accept – whether it is working 8-4, highly structured tasks or simply being told 'no', digital natives will often push against any constraints they perceive as unfair.

Generation X and Y are always impatient with managers as they live in the 'here and now' situation and they are used to getting what they want when they want it; fuelled by a digital environment where information is just a click away. These young librarians will struggle to adapt to long term goals and will often have expectations or requests that are commercially unrealistic. This may sound impossible. But how would library managers confront this? Weg and Martin (2011) state that **Generation X and Y** want their library work situations to be like entrepreneurial projects, want **Veterans and Baby Boomers** - mostly their library supervisors - to **hands-off supervision, have access across the library as well as have cross-library collaboration**. So, how can library managers cope with these situations?

With regard to managing the younger workforce, a huge engagement challenge for university libraries lies in missing out on opportunities to nurture future leaders. One of the biggest historical challenges in the technological workplace is effectively motivating and engaging top young talent. Human Resources (HRs) play a huge role in bringing this talent in but engaging and developing it is a responsibility all employees share. Gen Y and Gen X are the current and near term future leaders. Library managers need to invest in efforts to engage these future leaders in a positive way, at the risk of losing them and their influence on their peers. In the library workplace, the other thing

library managers must accept in order to manage **Generation X and Y** is that they do indeed to know more than they do in the digital world, at a tactical level, at least. As a way out, library managers should not try to compete with them in this their innate culture and they should not expect to have all the answers. The key to managing **Generation X and Y** lies in leveraging their very nature. Due to their absorption in digital channels and the instant gratification they receive as a result, they often struggle to comprehend the bigger picture. Instead, they become completely absorbed in the task at hand. This is where the manager adds value to the relationship offering a more overarching, long term structure for the **Generation X and Y** to work within. In conjunction with this, **Generation X and Y** also suffer, as most specialists do, in developing behavioural competencies. This is where **Veterans and Baby Boomers** as managers should focus most of their efforts - on behavioural rather than functional competencies. The **Veterans and Baby Boomers** should define what constitutes 'competence' from their unique, holistic perspective. This will provide the **Generation X and Y** with goals and development opportunities that they may not be able to perceive themselves. This allows the **Veterans and Baby Boomers** as managers to guide the **Generation X and Y** towards being a more rounded team contributor. The table below provides a guide on generational management as follows:

S/N	Generations	Managing the generations for Good Job Performance
1	Veterans	Respect them for their experiences, knowledge, and know-how. Motivate them with extra benefits, like an increase in health insurance. Respect their place in the company's hierarchy and the chain of command. Value politeness and punctuality.
2	Baby Boomers	Motivate them with flexible work schedules and extra time off to care for children and aging parents. Offer them opportunities to learn new skills and add to their personal marketability. Encourage them to work collaboratively and talk problems through with co-workers.
3	Generation X	Offer them opportunities to work independently and multitask. Not requiring them to attend too many meetings. Offer them guidelines for their work rather than micromanaging them. Recognize that they appreciate candor and delivering any criticism plainly and directly.
4	Millennials	Give them frequent feedback about their work, both positive and negative. Provide them with detailed instructions for tasks. Remember that Millennials tend to value their personal lives more than their jobs and that, unlike Boomers, they have no trouble letting their bosses know this. Taking advantage of how much they value their parents' wisdom and experience by matching them with older, experienced mentors. Make sure they have the opportunity to work with the latest technology.

Source: Adapted from EBSCO Corporate Learning Watch (2013).

4.1 Implications for Management

The next generation of managers, comprising many Millennials, will be more adept at managing in a changing, global, and networked environment. They will do it with a greater emphasis on teamwork; facility for the use of technology, and sensitivity to needs for work/life balance (Heskitt, 2007) Management is aware and as research has demonstrated that happiness directly relates to productivity (Sheahan, 2005); to keep the best employees, managers must keep them happy

which means making the employees' work environment fun. According to Hsieh (2010), creating a fun culture for employees boosts productivity and employee retention. Stereotypes and biases about generational characteristics that persist in the workplace as Fraone, Hartmann, & McNally, (2007) opine, sometimes prevent employees from recognizing the valuable contributions other people can offer. As a result, university libraries need to help their staff to learn to work more effectively across generations in

order to dispel many of the generalizations that can interfere with industrial harmony and team productivity.

To address this dilemma, organisations have discovered a new way out. According to Fraone, Hartmann, & McNally (2007), it is called '*generational competence*' - a term that describes the adaptations that organizations must make in order to meet the diverse needs of the four generations in today's workforce (Seitel, 2005). While it is true that Veterans, Boomers, Gen Xers and Millennials bring a variety of priorities and expectations to the workplace, management must recognize what motivates each generation and develop effective communication tools to minimize conflict, progressive human resources and work-life strategies to attract and retain key talent, and management practices to enhance productivity. According to Giancola (2006), "even though the generations are different, it does not necessarily mean they hold divisive values and attitudes that will affect their ability to work well together". Instead, organizations are reaping the benefits of the diversity provided by workers of different generations collaborating effectively and learning from one another.

4.2 Perspectives on Work

Many university library managers feel that their librarians should adapt to the library workplace on their own. As a result, these library administrators fail to consider making the required adjustments to address the needs of younger and older workers. However, librarians do have differences in their work perspectives, values (social responsibility and volunteerism), motivations (compensation, flexibility, intellectual rewards), and working styles. These variations in the disposition of employees can constitute a challenge for library managers to address. Librarians of different generations define success in different ways. For Gen Xers and Millennials,

no longer is moving up the career structure the ultimate goal. These groups of workers may care less about advancement than about work-life balance, and may be less willing to make sacrifices in terms of overtime or overnight travel (Fraone, Hartmann, & McNally, 2007).

4.3 Best Practices for University Library Management

It is important for library leaders and managers to be aware of and understand the different attitudes and expectations of an intergenerational workforce and how to manage them effectively. These managers should equally develop the competence to manage the potential clash points that may arise such as work ethics, managing change, and others. University library managers should avoid micro-managing as a style of leadership. Micromanaging is when a manager or leader assigns the work, tells capable employees exactly how to do it, monitors them excessively, and often takes over when work is not done exactly as the manager wanted. Therefore, instead of micromanaging, managers should act as coach or mentor and "be willing to allow for a coaching approach that creates dialogues rather than monologues" (Gavatorta, 2012). Best practices such as good communication and flexible leadership styles will increase the likelihood of successfully managing a productive workforce and meet the expectations and needs of individuals, as well as those of the entire organization. The following are practical solutions and best practices for creating a friendly intergenerational organization.

1. Accommodate employee differences—This means treating the other employees with the same politeness as they do their customers. The management should strive to identify and accommodate their employees' preferences such as work-life balance, flextime and scheduling options to

accommodate a diverse workforce.

2. Create workplace choices— Library managers should allow the workplace to shape itself around the work being done, customers being served, and people who do the work. This translates to decreased bureaucracy, casual dress code, shorter chain of command, a relaxed and informal environment, and having fun.

3. Operate from sophisticated management style—Library leaders and managers should be direct but tactful; and effectively articulate the bigger vision, specific goals, and measures. They provide autonomy to do the work and reward performance. Seven key attributes that characterize their level of flexibility are:

Their supervisory style is not fixed. Direct reports are managed by individual track record and personal preferences.

Their leadership style is situationally-varied.

They depend less on position power and more on personal power.

They know when and how to make policy exceptions for people.

They are thoughtful when matching individuals to a team assignment.

They balance concern for tasks and for people.

They understand the elements of trust, and work to gain it from their employees (fair, inclusive, good communicators, competent).

4. Respect competence and initiative— Library executives assume the best of their people. They hire carefully to assure a good match between the person and the job.

5. Nourish retention—They are concerned and focused on retention—offering lots of training, one to-one coaching, and re-training opportunities. They encourage regular parallel movement between jobs with broadened assignments.

Knowledge Transfer: As many Veterans and Baby Boomers retire from service or reach retirement age, the issue of knowledge transfer has become critical to libraries. It will be necessary to pass on the “intellectual capital” of experienced workers to those who will be the new leaders. This will require a focus on communication, documentation, and the formation of relationships that will facilitate the transfer of this critical knowledge. Human resources manager Glennis Hanley, from Monash University's Department of Management, believes that Baby Boomers are vital to the workforce today and should be encouraged to stay in the labour game as long as they can. The reason for this, he further states, is that 'businesses need to employ the broad-based business experiences of Baby Boomers to foster and transfer cross-generational knowledge.' Library managers must be in tune with how to work best with their staffs and encourage their teams to listen and to respect each others' experience and skills (Fraone, Hartmann & McNally, 2007).

Flexibility: Baby Boomers may be caring for their aging parents and require flexibility and support in order to maintain productivity at work and work-life effectiveness. Parents of young children and Millennials seeking personal challenges outside of work appreciate flexible work arrangements so that they can meet their life and work commitments. Generation X was the first to demand work-life balance as they became dual-income parents and were determined to be more involved in their children's lives than their often absent fathers. Especially, for the younger generations, time is often more important than money (Fraone, Hartmann, & McNally, 2007).

Mentoring: Pairing less-experienced library staff with more tenured professionals can help multiple generations develop a better

understanding of one another and the unique qualities they bring to the university library. Mentoring and 'reverse-mentoring' programmes also help develop new leaders in the organization and facilitate the transfer of knowledge from one generation to the next. Mentoring programmes can include: traditional one-on-one mentoring sessions, group mentoring programmes, or discussion panels where presenters provide information to a group of participants (Fraone, Hartmann & McNally, 2007).

Library Values and Culture: University libraries must refine their cultures so that the library values resonate with workers from all generations. Millennials, who value social responsibility and activism, are attracted to values-based libraries. Volunteer opportunities can be one way of showing the library's commitment to others, while also allowing all four generations to work together toward a goal outside of their work responsibilities.

Recruitment and Retention: University libraries need to determine what attracts talent to their workplaces and what needs to be done to retain this talent. Using traditional media, as well as new technology (especially, the social media) such as Monster.com, LinkedIn and MySpace, library managers can broaden their search for new workers. By conducting surveys and focus groups, managers of university libraries can find out what each generation expects and needs in order to stay engaged and productive. Librarians' daily nourishment provides one example. While Veterans were content to bring bag lunches from home, many organizations are now offering gourmet (and sometimes free) on-site food choices to keep workers engaged and energized (Fraone, Hartmann & McNally, 2007).

Recognizing and Appreciating Differences: Acknowledging and accepting differences among the generations' remains one of the most significant approaches in effectively managing the multi-generational workforce in a university library. As the Veteran and Boomer generations are working longer both by personal choice and financial impetus and as organizations become flatter, employees in all generations are interacting more than ever before. Linda Duxbury (2006), a professor at Carleton University in Canada notes, "Recognizing the diversity that these generations represent and understanding the different career paths and consequent career hurdles faced by each generation will help improve the work atmosphere". Making an active effort to diversify teams can help bring new perspectives and approaches to initiatives. Using multiple modes of communication to effectively reach employees, including memos, e-mails, newsletters and the company intranet honors style differences.

Training and Development Programmes: Managers of university libraries need information on how to effectively supervise and motivate a multi-generational workforce. They also need assistance in developing the strong interpersonal skills required to function effectively in a multigenerational workstation. While all employees should be expected to uphold the same standard of work performance, today's most successful leaders find ways to let every generation be heard (Forman & Carlin, 2005 cited by (Fraone, Hartmann & McNally, 2007)). This means that administrators of university libraries need to be in tune with the preferred working styles of the different generations and how they receive and react to feedback, especially with Millennials who react more positively to coaching than traditional constructive criticism. Employees need training on the value of diversity and how to work together

effectively.

Inter-Generational Communication:

Communication issues can present considerable obstacles to productive cross-generational relationship. A technology gap often exists between the mature and younger generations. As the older generation grew up with computers as a constant in their lives, Millennials prefer to use email, texting, and Instant Messaging over face-to-face meetings, memos and other more formal communication techniques. Baby Boomers may misinterpret this as disrespectful or avoidant behavior, while the younger generation may simply see it as a way to expedite work and maximize productivity (Fraone, Hartmann, & McNally 2007).

Younger Managers: One of the most dramatic changes that this demographic shift brings with is the increase in younger bosses managing much older workers in university libraries. Traditionally, the more experienced move up in their career structure and manage those with less experience. The societal demographics and rapid increase in the pace of work brought on by technological change has led to a growth in instances of younger librarians managing librarians much older than themselves. Another reason could be located in a deliberate policy shift by some university library managements to bring in younger employees to drive changes and innovation. Such changes in policy, naturally, lead to the recruitment of relatively young librarians with higher academic qualifications. Most of the times, these newly-employed library workers are given offices and responsibilities over and above their older colleagues in the hierarchy of the university library. This type of upside-down hierarchy is a potential cause of additional friction in libraries.

Conclusions and Recommendations

Mainly due to education, research and

technology, societies are changing rapidly into new age cultures of unrestricted communication and instant gratification (Jonsen and Martin, 2011). Administrators and management of university libraries must be mindful of this and strive to change with the times. New democracies are being shaped under these rules and new ways of working, living, socializing and doing business are emerging as a result of time compression. Librarians in university libraries are fully aware of the changes taking place in their workplace, but Generation X and Y have never lived in a world without technology. They are the epitome of the societal changes that have taken place during their lifetimes. Now, we have a reversal of the normal situation, where young people migrate into a workplace manned by seasoned Generations X and Y. Instead, in this digitalized age, 21-year-olds and their peers are showing up as Generations X and Y in the university library world dominated by Baby Boomers – that is, elders who often feel less at ease with new technologies (Rainie, 2006). The university libraries that fully understand and appreciate the power of Generations X and Y will have the competitive edge in the future. To achieve this, managers of university libraries have to use new and often subtle methods and behaviors when dealing with this generation. This does not mean that all that the university libraries have done in the past to attract and retain competent staff is obsolete. However, library managers and their management teams need to galvanize and oil their toolboxes as well as make some changes to their mindsets and work cultures. The Weberian construct of command and control has become anachronistic as a lever for managing these generational types. The future of the university libraries is about collaborating across all kinds of borders, including across generational borders. Focus should be more on behavioural rather than functional competencies to create development

opportunities. There is, therefore, need to invest time in understanding generational differences. The power base, as it were, is beginning to shift from Baby Boomers, and the libraries can learn as much from Generations X and Y as they can learn from Baby Boomers. Of course, Generations X and Y want to learn and collaborate, preferably, all the time. In conclusion, individuals—across all generations—as *Wright (2013) states*, need to feel satisfied, aligned, involved and loyal before they will give their best to their employer. Leaders and administrators in university libraries need to understand the requirements and expectations of each of their employees in order to provide the opportunities that will keep them engaged and inspire innovation. By being aware of generational differences in the university library workplace and adjusting management techniques cross-generationally, library managers can hope to be more successful in achieving the results they desire. Therefore, they will leverage the significant shift in societal demographics to build better and more relevant products, create more attractive work environments, and recruit better talent – leading directly to customer satisfaction, and then to societal appreciation.

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The Role of Information Technology in the Professional Development of Librarians and Adult Educators in Nigeria

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Abstract

*Professional Development (PD) is inevitable and a continuum for efficient and effective service delivery in all professionals including librarians and adult educators. It is on this backdrop that this paper seeks to explore the challenges facing Librarians and Adult Educators' professional development and examines the roles of ICTs and libraries for effective professional development and practice. The paper also presents the PD activities of the **National Adult Education Professional Development Consortium (NAEPDC)** of the United States. A brief history of professional development in the field Information Science is presented. Also Jesse H. Shera and Gerald Salton's educational models of information science curriculum are briefly highlighted. Based on the perceived underutilization of ICTs tools by Librarians and Adult educators, authors recommends several strategies for improvement which include that **National Adult Education Professional Development Consortium (NAEPDC)** be established in Nigeria by Adult Educators. Librarians and Adult Educators' curricula should be improved to reflect ICTs pedagogies.*

Keywords: Librarians, Adult educators, professional development, Information Science, ICTs.

1.0 Introduction

Professional development is an important vehicle to identify gaps in knowledge that can be addressed in future professional-development workshops. As with all initiatives involving educational strategies that are new to teachers, improved understanding among those expected to implement strategies requires well-planned professional learning workshops and adequate time for implementation to ensuring

success (Ferguson, 2006). Information science education began slowly in the 1950s and 1960s. Two educational models evolved over time and were followed for decades to come. They were pioneered by Shera and Salton. Both models have strengths and weaknesses. A third model is presently emerging, under the label of i-Schools. Adult Educators must understand the concepts in processing professional development and what it means to education. Montiel-Overall

& Hernández (2012) observed that in workplaces, **professional development** refers to the acquisition of skills and knowledge, both for personal development and for career advancement. Professional Development (PD) encompasses all types of facilitated learning opportunities, ranging from college degrees to formal coursework, conferences and informal learning opportunities situated in practice.

It is against this background that this paper tends to discuss the concept of professional development and the role information communication technologies play in the librarians' and educators professional development in Nigeria.

2.1 Literature Review

Writing about adult education curriculum, Ihejirika & Mbalisi (2014) believe that the curriculum of adult and non-formal education in Nigeria needs to be repositioned, redirected and re-engineered to make way for proper development and training of both would-be and working adult educators and practitioners. The reengineering of the curriculum is necessary to maximally equip adult educators and practitioners with appropriate skills, knowledge, attitudes, commitment and motivations required for effective and efficient design and implementation of problem-specific programmes. They further reiterated thus:

“There should be a mixture of methodology used in training future adult educators and practitioners. Unconventional methods such as excursion, field trips, case study, action projects, etc. should always be combined with conventional methods such as lecturing, discussion and so on. Efforts should be made to identify and collaborate with governmental and non-governmental agencies with adult education programmes in priority areas. Collaborating with these agencies will go a long way in changing the orientation of

lecturers, students, educators and practitioners towards adult education”.

This means that adult education should have a paradigm shift from traditional classroom teaching and learning to outreaches that involves the special groups of learners. It is obvious that adult educator should be involved in professional development activities from time to time. This study therefore aims to identify factors that inhibit full participation in PD activities and strategies for overcoming them. Information and Communication Technologies and Libraries have roles to play in order to make this a reality.

2.1 National Adult Education Professional Development Consortium (NAEPDC)

The **National Adult Education Professional Development Consortium (NAEPDC)** was incorporated in 1990 to fulfill a desire of state adult education staff to enhance their professional development. Organized by state directors of adult education, NAEPDC has five main purposes:

- i. To coordinate, develop, and conduct programs of professional development for state adult education staffs;
- ii. To serve as a catalyst for public policy review and development related to adult education;
- iii. To disseminate information on the field of adult education;
- iv. To maintain a visible presence for the state adult education program in our nation's capitol; and
- v. To coordinate the development of national and/or international adult education initiatives and link those initiatives to state programs.

Since its inception, the National Adult Education Professional Development Consortium (NAEPDC) has established itself

as a major force in the adult education community. More than 50 states in the US and territories are members. NAEPDC works with the Department of Education (Office of Vocational and Adult Education), the National Institute for Literacy, the National Center for the Study of Adult Learning and Literacy, the National Center for Adult Literacy, the National Coalition for Literacy, and other national adult education organizations in planning for programs and activities to support adult learning initiatives.

The National Adult Education Professional Development Consortium (NAEPDC) responds to the needs of its member states through a variety of activities, such as:

- i. Training activities geared to specific needs of state staff
- ii. Publications which provide promising practices and strategies for fostering effective state leadership;
- iii. A wealth of online resources to provide state policy and procedure models and options; and
- iv. Specialized services for new state directors to support their leadership and management skills. (NAEPDC, 2011).

2.2 Impact of Librarians and Libraries in Professional Development

The role of the librarian remains fundamentally unchanged. Bains (2013) noted that the consequences of the web have been enormous, and the pace of change shows little sign of slowing. But, fundamentally, librarians' role remains what it always has been - to support our institutions in the delivery of their research and learning strategies. This implies that what librarians need to do to achieve this, though, is radically different from what it was before the explosion in networked digital information. Recognition of this fact and readiness to adapt with paradigm shift will make librarians and the information professionals become more

relevant to their academic colleagues and students.

Libraries are becoming about supporting study, not storing books

The assumption that librarians might cease to require library buildings as we move towards digital collections has not been borne out. There is huge demand for space from students, but librarians are becoming people spaces instead of book spaces.

Librarians need to become effective marketers

In the past, there has been no need. We have been the gatekeepers of knowledge, and our users have had no choice but to engage with us. Now they do have a choice, they can access knowledge online, so we must engage more effectively than we have in the past. Having said that, I think librarians are effective strategists, and we are good at developing plans, services and business cases to position libraries in new ways. But we must think from the user's point of view, understand their needs, create services which are meaningful to them, and be effective in promoting them.

Similarly, there are several Library and Information Science Consortia that librarians in Nigeria are not fully utilizing professional development opportunities being offered. Librarians should, through their professional affiliations, (like Nigerian Library Association and Librarians' Registration Council of Nigeria) acquaint themselves with professional skills that will enhance their professional practice.

2.3 Professional Development in the field of Information Science

The late 1990s and early 2000s saw a movement to broaden and reorient information science education, spearheaded by a number of deans of schools with strong information science schools were renamed into Information Schools or i-schools. An

informal i-School Caucus was formed in 2005. By 2008, the Causes included over 20 schools quite diverse in origin. They include schools of: information; library and information science; information systems; informatics; public policy and management; information and computer sciences; and computing. The i-Schools are primarily interested in educational and research programmes addressing the relationship between information, technology, and people and understanding the role of information in human endeavours (Saracervic 2010).

While the i-School movement was originally restricted to the United States, some schools outside the United States are joining. The movement is attracting wide international interest. The i-Schools represent an innovative, new approach to information science education, with some true interdisciplinary connections. As the millennial decade draws toward an end, it is also signifying a new direction to information science education.

3.1 Strength and Weakness of Shera and Salton Educational Models

The strength of the Shera model is that it posits education within a service framework, connects the education to professional practice and a broader and user-oriented frame of a number of other information services, and relates it to a great diversity of information resources. The weakness is a lack of a broader theoretical framework, and a lack of teaching of formalism related to systems, such as the development and understanding of algorithms. A majority of researchers in the human information behaviour and user-centred approach are associated with this educational environment. Out of this was born the current and widely used designation *library and information science* (Saracervic 2010). The strength and weakness of Salton's Model are presented in the table below:

Table 1: Strength and Weakness of Salton's Model

S/N	The Strength of Salton's model	The Weakness of Salton's model
1	Starts from a base of a firm grounding in formal mathematical and other methods	Ignores the broader aspects of information science, as well as any other disciplines and approaches dealing with the human aspects, that have great relevance to both outcomes of Information Retrieval Research and research itself; and
2	Relates directly to research.	Does not incorporate professional practice where these systems are realized and used. It loses users.

Source: Tabulation authors'

Consequently, this is successful, but narrowly concentrated education in IR as a specialty of computer science, rather than in information science. Not surprisingly, the researchers in the systems-centred approach came out of this tradition (Saracervic 2010).

3.2 The role of ICTs in Professional Development

The use of Information and Communications Technologies (ICTs) has expanded in the context of educational, documentation and library and information services employed by grassroots movements and village associations, even as market forces are exploiting them to transform education into a commodity. These same technologies have been put to work as tools for self-expression providing new opportunities for creative expression. They have also facilitated the free exchange of information, ideas and products through innovations such as open-source software, peer-to-peer sharing and even email, contributing to an affirmative culture of knowledge sharing and interactive learning (Hinzen, 2003). Writing about the importance of ICTs for training teachers, (Fal 2004) asserts that “information and communication technologies offer huge potential for the training of trainers, the rapid production of teaching materials and, above all, wide dissemination of knowledge, etc. In other words, both librarians and educators should owe it as an obligation to leverage the information technology tools in their professional development and services delivery within and outside their institutional/working environment.

Conclusion and Recommendation

Researchers in this review paper have identified adult education professional development challenges. They have also ascertained the role of ICTs for effective professional development programme for

both librarians and adult educators. Equally the role of libraries in professional development has been examined.

Adult education as a profession has to do with equipping adult learners and adult educators with worthwhile knowledge for better practice. It appears, however, that in Nigerian educational institutions adult educators are not adequately equipped with knowledge and skill to carry out their teaching function better. It also appears that Adult Educators are not fully and or frequently involved in professional development programmes. Compared to developed countries which have established consortium for the nation, such as the National Adult Education Professional Development Consortium (NAEPDC) of United States Nigeria is yet to come up with such establishment. Librarians and Adult Educators seem to be under utilizing ICTs tools to enhance their profession.

It is recommended that librarians and adult educators should always associate with their professional organizations through workshops and conference attendance in order to be more equipped for professional practice their educational, library and information science service delivery in Nigeria. Inasmuch as the base or core courses that students are taking rest in the traditional library and adult education curricula, teachers of both disciplines should rearticulate curricula to include modern trends (involving ICTs aspect of the disciplines. In other words there should be technologically based education for students; while workshop and conference themes for workers should include ICTs. This will ultimately enhance academic performance and professional practice.

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Use of Internet for Knowledge Communication in Political, Social and Economic Development of a Society: Challenges and the Role of Librarians and Information Managers

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Abstract

The paper examines the use of Internet for knowledge communication in political, social and economic Development of a society using descriptive survey research method. It defined the concept of the Internet, discussed the impact of Internet in social, economic and political development of a society across the globe. It also identified insecurity of businesses, reduction in the chances for development of relationships, copy right issues, development of incompatible relationships, adoption of foreign culture and tendency for incitement of public riot as some of the challenges associated with knowledge acquisition using the Internet. The paper also proffered solutions to the challenges inherent, ranging from the use of encryption and decryption method to transform text or messages, use of digital certificates, digital signatures and scrupulous monitoring of children and adolescent on their activities and what they watch on the net considering their ages. The roles librarians should play in order to curtail abuse on the Internet especially within the electronic resources section of the library are briefly highlighted. This paper concludes with recommendations that librarians and information scientists/managers should play key roles in ensuring proper use of the Internet to the utmost advantage of all categories of users including teenagers and children who have access to the Internet.

Keywords: Internet Technology, Socio-Political Development, Knowledge Communication, Librarians.

1.0 Introduction

Internet plays a very crucial role in knowledge communication the world over. Not only in knowledge communication; it has also brought political cum socio economic development to societies across the globe. It empowers people and organizations through the provision of quick and easy access to

information, as in the saying “information is power”. Before the advent of Internet technology, sharing of information was very difficult and the access was restricted to limited people or area. Maheswarapper and Ebanza (2003) identified Internet as the largest single source of information at global level covering all aspects of human

endeavours, be it education, health, economic, social, political e.tc. For example, in education, Lumambono and Nane (2004) assert that Internet gives scholars the opportunity to globally disseminate information to a wider audience within the shortest possible time. This assertion was further corroborated by Madhusudhan (2007) whose study on Internet use by research scholars revealed that most researchers use the Internet to locate relevant information.

This paper is therefore going to define the concept of Internet technology, examine the importance of the Internet in knowledge communication in social, political and economic development of a society using descriptive survey reach method. It will also identify the challenges associated with the role Internet play in knowledge communication across the globe and proffer solutions to the identified challenges. Librarians' roles in ensuring proper use of the Internet are also highlighted.

1.1 Origin and Definitional Concept of the Internet

Internet is a computer system that allows millions of computer users around the world exchange information on the net. The idea of Internet began with the development of APRANET which was the first network to use the internet protocol by the US Department of Defence around 1950s and the 1960s. The online Cambridge Dictionary defined Internet as “a large system of connected computers around the world that allows people to share information and communicate with each other”. Daniel (1999) sees Internet as “a meta-network, a constantly changing collection of thousands of individual networks intercommunicating with a common protocol”. Moreover, Madu and Ezeani (2010) defined Internet as, a” communication system which creates room for interconnecting of millions of individuals from millions of places”.

2.0 Literature Review

2.1 Importance of Internet in the Political Development

Politically, the Internet has had an unquestionable impact in the 21st century. It has significantly influenced our channels of communication and forms of interaction. The impact of internet on politics can be seen through the lances of political campaigns and rallies for various social issues. The internet and other media like radio and television have always been used to educate, inform and persuade. For example, many political analysts agree that John F. Kennedy won the 1960 elections by taking advantage of television network.

According to the report by Fair Observer (2015), President Barack Obama used the internet to win the presidential elections by communicating his messages to voters over YouTube, Facebook, and Twitter. (www.fairobserver.com/region/north_america). Still in America, Democrats succeeded in gathering millions of volunteers and small donations through internet campaigns. The contemporary times political campaigns, social movements and web revolutions are indicators that the internet is already changing politics in terms of communication, participation and mobilization. According to Margetts (2013) “the Internet is contributing to increased popular control and hence to democracy”, so also in both democratic and authoritarian states by enabling political participation and civil engagement”. According to her, not social media such as YouTube, Twitter, Flicker, Facebook, Tumblr and others are used for political activities, but there is evidence to suggest that using the internet makes one more likely to vote or participate politically.

In some countries where democracy is weakened or threatened especially where the

traditional media are directly or indirectly controlled by the government, the internet serves as a medium of expression for opposition and protests which is outside government control such as mockery of political figures through fake photos, wordplay e.tc., which can be disseminated more widely through social network. Clark (2013) explained that “Reduced barriers to identifying and co-ordinating like-minded individuals in forums, blogs and via Twitter hashtags not only enable even the most niche groups of individuals to build thriving on-line communities, but also, for these communities to host inconspicuous “every day politics”.

The internet now lies at the heart of democratic society. It has enabled citizens to group to mobilize and hold government and politicians accountable unlike before. It has also expanded public participation in democratic processes. Social media in particular can reconnect citizens with their democratic institutions in new and dynamic ways.

2.2 Importance of the Internet in Economic Development

Recently, the World Development Report examined the role of knowledge in promoting socio-economic development. It began with the realization that economies are not only built through the accumulation of physical capital and human skills, but on a foundation of information, learning and adaption. It is therefore necessary for societies to understand how they acquire and use knowledge in various dimensions of development. This assertion was evident in a study by Press (1997), which showed a positive correlation between the number of internet hosts in a country and the UNDP Human Development Index. The internet now appears to have opened up new options for socio-economic development. Press further posited that internet connections for economic purposes is the fastest-growing

sector of the internet as more and more companies are establishing links with customers. Almost every business now has a web-site and business partners. Vendors establish contacts through the internet.

Internet increases marketing opportunities i.e. manufacturers take advantage of the internet because they use it to post information and market their businesses. For example, in product design, companies can share information and improve their successes according to Lexis-Nexis (2000). The Internet allows business men and women to import and export in partnership with foreign countries. In some instances meetings are held between corporation on-line in the form of “virtual meetings”, in so doing relevant information is being passed to society. It allows manufacturers to discuss business without travel which is another dimension of economic value of the internet.

Businesses that take advantage of the internet's numerous features, find it highly beneficial to the success of their company. In another development, internet increases advertising opportunities. There are new types of software that automatically arrange data to be published on the web. Through the internet companies advertise their goods or services much quicker than they could, when using tangible documents. According to Internet Indicators (2000) files from the internet serve a variety of purposes such as, “hosting on-line meetings, accessing design information from the world wide design community, and dragging content from manufacturer's websites and dropping into drawings.

On the other hand, the Internet takes the place of unnecessary labour and reduces costs. Previously, companies spend thousands of dollars hiring receptionists, secretaries etc. companies can now save money and spend more time planning marketing strategies thereby reducing costs. That not with understanding, labour still needs

to be employed to supply the demands of consumers. The Internet provides worldwide economic opportunities as a result of having access to the worldwide web. Many companies specifically those with high rates of poverty now have the opportunity to use the net and possibly create business negotiations with wealthier countries. Once there is interaction, countries may offer economic assistance.

2.3 Importance of Internet in Social Development

There has been an increasing recognition that suitable and more equitable forms of human development does not only depend on the existence of Internet connections alone, but on the acquisition and usage of information and knowledge gained through the internet as put by Rogerson and Itoh (1998) and Mansel (1998). Harnessing the Internet to deliver benefits especially in developing countries means ensuring that those facilities are responsive to the poorest and most disadvantaged communities. Internet communication brings people from two or more different parts of the world together to interact and use knowledge in various aspect of social development. It assists in management of crises, poverty alleviation and wealth benefit e.tc. An example of such is the Greater Horn of Africa Electronic Communication Network project founded by the United States Agency for International Development (USAID) which helped to link member states of the region in order to exchange crises related information.

Another area of potential/social benefit of the internet is in the application of electronic network to problem of food insecurity in Africa, which led to competition for local resources between groups which could have led to civil war. However, with electronic network, such problems were ameliorated. In farming, Internet delivers critical information to farmers, extension

workers and researchers without which there could have been problem for farmers fighting crises as asserted by Adam (1996) and Panos (1998). In terms of poverty alleviation, Grameen Communications (1998) posit that village internet programme in Bangledash was aimed at reducing migration from villages, creating IT-related job opportunities for the rural poor and creating familiarity with computers among the rural population of the country.

In the same vein, another remarkable social importance of the internet is the role it plays in establishing relationships between individuals who had not known each other. In some instances, such relationships which started on twitters and other social media even resulted to successful marriages. The Internet is also a tool for empowerment of marginalized groups. It offers opportunity for direct communication between developing countries and many activist and non-governmental organizations (NGOs) that share political goals through the web. There are many examples of activists who have used the net to help empower marginalized groups throughout the world. The internet is also used for posting debates and policies on bulletin boards in order to solicit responses and organize protests. Citing another example, NGO women group charities used e-mail to keep in touch with women in Bosnia. It was difficult to make phone calls to find out what they needed, but e-mails kept on trying until according to Annis (1994) and Frederick (1994) it found its route to deliver the message. The Internet has become more accessible to all people, regardless of age, income or level of computer literacy.

Internet increases marketing opportunities i.e. manufacturers take advantage of the internet because they use it to post information and market their business. The Internet provides worldwide economic opportunities as a result of having access to the worldwide web. Many companies

specifically those with high rates of poverty now have the opportunity to use the net and possibly create business negotiations with wealthier countries. Once there is interaction, countries are ready to offer economic assistance.

3.1 Challenges Associated with the use of Internet in Knowledge Communication

The following challenges emanating from the use of Internet have been identified as having adverse effect on the political, social and economic development of a society:

(i). Insecurity of Business

The advent of the use of internet in business transactions has increased the chances of bringing companies the risk of being defraud. Unfortunately, many small companies or home business owners do not realize that they are also likely to be targeted as any large company. As consequences of existing in the digital age, almost everyone is vulnerable to breaches of security. Jenkins (2000) has it that, “if your business relies on computer or Internet technology, you need to be prepared to deal with security issues”. This shows that all businesses that solely depend on internet are prone to attacks ranging from that of theft, loss or unauthorized access. With the constantly evolving nature of the internet, it is vital that users continuously protect themselves and their information.

(ii) Reduction in the Chances for Developing Relationship

Doing business on the Internet can open markets for entrepreneurs all over the world. That notwithstanding, it can be more difficult to develop on-going business relationships. If a business entrepreneur is in Nigeria for example, chances are he would not have the opportunity to meet face-face with a customer in Japan or United State, while Technologies such as video conferencing, Skype etc., allow

an individual to see his or her business partner via computer screen, it lacks the personal contact or relationship that could have been established on meeting someone in person.

(iii) Copyrights Issues

Due to the ubiquitous nature of the internet, copyrights issues infringements are difficult to control. With the internet covering the entire universe developing a set of uniform copyright law is virtually impossible. If a business is successfully developed over the internet, it will be difficult preventing someone from copying the business model and using it for his or her own benefit.

(iv) Development of Incompatible Relationships

Many instances are heard of relationships developed via the internet social media, some even led to marriages but on coming together physically, the two parties realize that they cannot stand one another either due to natural hate or incompatibility etc.

(v) Adoption of Foreign Culture

Cultures differ from one country to another and even within the same country; cultures differ between one social or ethic group and another. The advent of internet has globalized the whole world making it very easy for people from any part of the globe to adopt cultures that are alien to them. This factor has greater influence on children, especially adolescents. They easily get carried away by things they see on the internet, they watch porno films, see and read thing they ordinarily should not be seeing and reading at their ages. This syndrome has negative effect on the moral upbringing of children. Even though certain things and behaviours may not look offensive in some societies, to some they are highly offensive.

(vi) Inciting Public Riot

Due to availability of easy means of communication among people through internet, it is now easy to incite public riots by any aggrieved group in the society. For example, a political group can easily disseminate provoking or inciting information which may or may not be true, through internet social media to heat up a polity thereby bringing instability in a country. Before the advent of the internet technology, it was difficult or almost impossible for a person or group of persons to disseminate information to people in a big town talk-less of state or country as a whole. Today this can be done throughout the world in a matter of seconds!

4.1 Solutions to the Identified Problems of Internet Use

Electronic business systems have higher risks of insecurity than do traditional business systems. Hackers are one of the greatest threats to security of e-business affecting customers and businesses. Confidentiality, authenticity and the integrity of the data needs security measure to check the menace of hackers, data storage, data transmission and the use of anti-virus software is necessary. Other measures include the use of firewalls and encryption i.e. transforming texts or messages to code restricted access to private networks, as well as public networks that a company may use. The firewall can also log attempts into the network and provide warning when unauthorized attempts are taking place. For businesses that use Wi-fi, they need to consider different forms of protection because it is easier to access. Such businesses should look for protected access, virtual private networks or internet protocol security. Another option is the use of an intrusion detection system that alerts when there are possible intrusions.

(i) Encryption

Encryption transforms texts or messages into a code which is unreadable. The messages have to be decrypted. This usually has two keys used, one for public and the other for private. The public key is used for encryption while the private key is used for decryption. The level of the encryption can be adjusted and should be based on information which could be just a slide of letters or random mix-up of letter.

(ii) Use of Digital Certificates

Digital Certificate is used to identifying the owner of a document. By so doing, the receiver will know that a document coming to him is an authentic one. This can be used in different ways by a company. It can be used as a replacement for user name and passwords. This helps to assure authenticity of documents as well as the confidentiality of such documents and data integrity.

(iii) Use of Digital Signatures

If a document has a digital signature on it, another person cannot edit the information without being detected. For an individual to use digital signature, he must use a combination of cryptography and a message digest. The message digest will be used to give the document a unique value encrypted with the sender's private key.

(iv) Social and Business Relationships

For the development at incompatible relationships, individuals concerned should ensure that before a relationship goes to the extent of contracting marriages, the concerned individuals should ensure that a physical contact is initiated to avoid regrets in the long run. Also in terms of business relationships, efforts should always be made to meet each other physically to ensure compatibility. Osagie (2015) posit that relationship on-line by chatting and exchanging telephone numbers before

physically meeting is a probability which is good to someone and bad to another. He suggested that parents should come close to their children to know their problems and know what they are into, to protect them from having on-line relationships at an early age.

4.2 The role of the Librarians and Information Scientists

Librarians and Information scientists have a role to play in curbing the menace of Internet abuse. They could do this by purchasing books, pamphlets, magazines and other resources that discuss disadvantages of the Internet. They should displace such materials in the library where they will catch the attention of the users. This strategy will particularly apply in the teenagers and children libraries. Also printing beautifully designed and attractive inscriptions and placed in strategic places of both adult and children libraries on the Dangers of Pornography and giving ones' account number or ATM pin number to some people met in the Internet.

Librarians and Information Scientists including ICT experts, they all have significant role to play in order to minimize the use of the Internet facilities installed in the electronic libraries of their institutions. They can as well boldly print the inscriptions that using certain Web sites are prohibited; and mention the punishable consequences. Also they can restrict users from accessing other Websites other than the databases already subscribed by the organization or institution mainly for research activities.

Conclusion and Recommendations

Knowledge communication has become so easy in contemporary times as a result of the advent of the internet technology and its application in execution of duties, responsibilities and business transactions. As a result, one could say that, the use of internet has brought about enormous developments in

politic-social-economic development of all nations. However, the development and the positive impacts have to be taken with caution, because the disadvantages could be destructive in one way or the other. It is therefore left to the beneficiaries of the development to be able to separate the grains from the chaff.

To address the challenge of adoption of foreign culture especially in the youths, parents should try as much as possible to monitor what their children are watching on the Internet. Librarians and information scientists should play their roles in campaigning against unethical use of the Internet. They should device means of restricting access to only online databases mainly for teaching, learning and research activities.

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