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## Implementation of Digital Library in Oil and Gas Polytechnics in Nigeria

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**Abstract** Technology in the 21<sup>st</sup> century has brought about immense and unquantifiable ease of actualizing purposes and producing effective communication means which cuts across all walks of life. The growth of every sector in Nigeria is highly attributed to the impact of technological advancement. The advent of Information Communication Technology (ICT) has now placed huge demands on librarians and library managers in ensuring that they are not left behind in this fast moving train of technology innovation. Educational improvement and development in Nigerian higher institutions of learning is proportional to the implementation of digital library in such higher institutions of learning. This paper unravels the factors such as regular power supply, low budgetary funding amongst others negating the implementation of a digital library in Oil and Gas Polytechnics and other oil and gas related institutions located in the Niger Delta region of Nigeria. Recommendations are made on appropriate improvement of digital libraries in oil and gas polytechnics such as increased budgetary funding, adequate training and re-training and joint digital library development. The authors conclude by emphasizing the need for digital library in oil and gas polytechnics.

**Keywords** Digital library, Education, Library, Niger Delta, Technology

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### Introduction

The education policy on Higher Education in Nigeria over the years has been reviewed time and again by the Ministry of Education to achieve proper standard in the education sector. Higher education is expected to develop, grow and train manpower in various fields to bring about economic growth and advancement. Yakubu, [1] Observed that the principal aim for the establishment of Polytechnics in Nigeria is to turnout the middle level manpower needed for industrial and technological development of the country. No meaningful national development could be achieved by any nation without sound and qualitative technical education. Polytechnic education in Nigeria under the direct monitoring of the National Board for Technical Education (NBTE) has increased in recent times due to wide acceptance of the curriculum. Specifically, there is high rise in the number of polytechnics both private owned and government established institutions.

According to the NBTE, [2] statistics, there are 25 federal government owned polytechnics, 45 state governments owned polytechnics and 42 private polytechnics in Nigeria. This puts the total of polytechnic institutions in Nigeria at 102 as at December, 2016. In 2016 alone, eleven private polytechnics were approved in Nigeria. This goes to show that mid-level manpower such as technologists and technicians are in high demand by the Nigerian economy as a result of their acquired knowledge, self-reliant and entrepreneurial skills.

The idea to establish Oil and Gas institutions was conceived by the federal government during a Niger Delta stakeholders' meeting in 2006. This idea was to institutionalize oil and gas polytechnics in specified states of the Niger Delta region of Nigeria viz: Bayelsa, Rivers and Delta states. The federal government mandated Petroleum Trust Development Fund (PTDF) to arbitrate in the setting up of these oil and gas institutions with



well-furnished facilities [3]. To actualize this mandate, the PTDF began massive re-construction of the site location for the oil and gas polytechnic in Ekowe, Bayelsa State from 2006 which was formerly a Government Technical College. The PTDF also began to develop the site in Bonny Island, Rivers State for the oil and gas polytechnic and with the already existing Petroleum Training Institute, Efurun, in Delta state.

The federal government aims to produce effective manpower in the field of oil and gas to encourage local content participation of indigenous people in the oil and gas sector of the Nigerian economy. The project was conceived to provide specialized oil and gas training for the development of middle-level manpower requirement of the petroleum sector. For proximity to oil exploration and exploitation in upstream and downstream operations [4]. This initiative became laudable and commendable as it has opened the door of opportunity to the people of the Niger Delta region which has witnessed so much limitation and neglect.

Information is crucial to the growth and the development of these middle-level manpower. The availability and accessibility of information to international best practices in the established oil and gas institutions in the Niger Delta becomes a fulcrum on which the pendulum of high standard and performance of the institutions rest. It is very possible that information seekers and users may not know about the resources available but providing the needed information in the form of library acquisition of non-book materials (digital collections) go a long way to raise the standards of the oil and gas institutions across the Niger Delta. The role of libraries has not always been made clear to information seekers, particularly in developing countries. Ologbonsaiye (1994) cited in Ugah, [5] observed that some libraries and librarians have concentrated on traditional resources and services, which may in itself be an obstacle to information access and use. Information access and use can only flourish in a society that appreciates the need for it and where government recognizes that information is the key to national growth and prosperity.

The library in an academic institution is created to bridge the information gap and to enable users' have access to knowledge in the area of study. It is no doubt that an academic library is known to be the repository of knowledge and information which is well-revered by students and the entire education community. It is unlikely to find an educational institution without a library. The very essences of education are rightly embedded in an academic library. Jubb and Green (2007) cited in Yusuf & Iwu, [6] observes that academic libraries have for centuries played critically important roles in supporting research in all subjects and disciplines within their host universities or colleges.

As knowledge advances in various human fields on daily basis, literatures, textbooks journals are being updated for relevant and up-to-date information. The library must be equipped with the capabilities to keep up with trends because the world we live in today is fast moving from the analog means of accessing information to a high scale digital mode of information accessibility. Therefore, to meet the dire needs and satisfaction of library users, academic institutions have no other option than for their libraries to fully go digital in providing and making information available to users' which include students, lecturers and the polytechnic community at large. According to Etebu [7] advances in ICT, electronic information in the form of electronic books, electronic journals, and the internet have launched the world into an information age. No institution or organization can still solely rely on only traditional printed information resource to perform effectively and efficiently.

To librarians, ICT is a significant development that provides tools for managing the avalanche of information generated by modern society. Through the use of digital library, library users can access millions of books, journals and periodicals at the click of the mouse. Storage of materials are enhanced against theft, rodent and pest. Furthermore, library users can access these materials from any location on campus.

### **What is digital Library?**

Defining Digital library can be said to be a herculean task for some reasons which are clearly justifiable. One of such reasons is that over the years as technology keeps evolving, librarians and library researchers have given different names or phrases to refer to the same purpose and function. These include "library-without-walls", "virtual library", "e-library" and so on. All these terms have been used in the library interchangeably as meaning one and the same thing. However, these phrases are no longer frequently used which eventually has given room for the term "digital library". It is only recently that "digital library" assumed the center stage of most conferences, journal publications and researches.



Another cogent reason as identified by Gary [8] in his paper to the Digital Library Federation is the fact that there are so many things professionals from various fields refer to as digital library but to a typical librarian or library researcher, they are not digital library. This brings about confusion and further beclouds the definition of digital library. Some examples of such things as listed by Gary [8] are:

1. For computer scientists and software developers collections of computer algorithms or software programs are digital libraries.
2. For database vendors or commercial document suppliers, their databases and electronic document delivery services and digital libraries.
3. For large corporations, a digital library is the document management systems that control their business documents in electronic form.
4. For a publisher, it may be an online version of a catalogue.
5. and for at least one very large software company, a digital library is the collection of whatever it can buy the rights to, and then charge people for using.

Tella [9] Citing Lynch (1997:52) buttressed this point further:

*One sometimes hears the Internet characterized as the world's library for the digital age. This description does not stand up under even casual examination. The Internet--and particularly its collection of multimedia resources known as the World Wide Web--was not designed to support the organized publication and retrieval of information as libraries are. It has evolved into what might be thought of as a chaotic repository for the collective output of the world's digital "printing presses.".... In short, the Net is not a digital library. Pg.52*

So, to define digital library, it is very pertinent to first understand or know what digital library is not:

- The internet is not digital library and vice versa
- Digital library cannot be all encompassing but rather specific to a group of people.

Clearly, the digital library federation defines it as "Organizations that provide the resources, including the specialized staff, to select, structure, offer intellectual access to, interpret, distribute, preserve the integrity of, and ensure the persistence over time of collections of digital works so that they are readily available for use by a defined community or set of communities" [10]. Lynch (1994) cited in Bamgbade et al., [11] reveals that "digital Libraries [provide] users with coherent success to a very large, organized repository of information and knowledge". Through the implementation of digital libraries, the library users in the various oil and gas institutions in the Niger Delta Region of Nigeria can gain access to lots of digital materials that will aid them to improve their knowledge and also increase the amount of shared contents with others and further facilitating the expansion of education in Nigeria.

With the advent of digital library, institutions can reduce the challenges faced with traditional libraries such as limited space for collection of printed materials since books consume lots of space, digital library overcome this limitation and hence the internet and cloud storage technology can accommodate billions of digital materials in terabytes and petabytes at a reduced cost. Another major challenge digital library resolve is to provide accessibility to materials anywhere round-the-clock otherwise called "library-without-walls" and can also be accessed by multiple users at the same time. Thirdly, with digital library deterioration caused by rodents and pests become less worrisome.

### Factors to Consider for Establishment of Digital Library

To be able to provide services to library users, digital library requires the following resource to be adequately provided:

1. **Technological infrastructure** – The backbone of a successful digital library is the availability of technological infrastructure which includes
  - ✓ Server Systems either local server (localhost) or online dedicated server;
  - ✓ Database (online or offline) of digital contents accessed over the network;
  - ✓ Computer systems and backup computer systems in case of system failure;



- ✓ Network infrastructure either by WAN or LAN to provide intranet or internet facility to the server system;
  - ✓ High bandwidth internet connectivity;
  - ✓ Digitization or optical character recognition (OCR) equipment meant for scanning and conversion of book materials to non-book materials eg. Scanner and;
  - ✓ Power supply and backup power such as solar or inverter.
2. **Software** – There are various software in the world which provides usability in digital library. support for different documents formats, metadata support, online/batch content updating, indexing and storage, search and retrieval (metadata, full-text), multi-lingual support, interoperability support, access and usage management, collection administration, and support for standards like Dublin Core, Unicode and XML [12]. Digital library softwares are available both as paid (commercial version) or open source (free version) all over the internet, the commonest being fedora. On the other hand, ICT support staff could also recommend to design digital library software for the digital library. Another software necessary for consideration is the OCR software such as free OCR, Fine Reader etc. which are also available either as paid or free version.
  3. **Personnel Infrastructure** – This is another crucial asset needed to be considered for a successful digital library. The role of the technical and ICT staff cannot be over-emphasized because they function not just at first installment of the digital library but also continuously for maintenance and effective operations. It is important to assign personnel with right skills and attitude to handle various tasks associated with the digital project [12]. It is expected that all the university libraries should have ICT experienced fulltime Librarians, Full time ICT professional to look after the ICT activities' ICT advisory committee having the members of ICT experts and clearly written ICT policy for proper development and use of ICT in library activities [13].
  4. **Funding** – The overall aim of the digital library project in the Niger Delta can be defeated if it suffers lack of adequate funding both in the implementation stage and the operational stage. Adequate funding for this project should be built into the budget of the benefitting institutions annually in order to ensure that there is no breakage in the operations of the digital library. Various means of funding could be employed to provide stronger support for the digital libraries which includes grants from international bodies such as The United Nations Educational, Scientific and Cultural Organization (UNESCO), World Bank or local bodies such as the Petroleum Trust Development Fund (PTDF) as the intervention body for the oil and gas institutions in the Niger Delta, National Information Technology Development Agency (NITDA), Nigerian Communications Commission (NCC) and related agencies of government.
  5. **Digital Collections & Maintenance** – Collection of digital materials and the conversion of non-digital materials to digital materials continuously will ensure that the digital library provide users of the library with new and up-to-date resources for learning.

#### Factors inhibiting the implementation of Digital Library

##### 1. Lack of regular power supply:

The growth of ICTs on campuses has been stalled by insufficient electricity supplied by Power Holding Company of Nigeria, a state monopoly. Universities have resorted to diesel-driven generators, which are polluting and expensive to maintain, for institutions with limited resources, forcing them to look for alternative sources of energy to fuel ICT infrastructures [14]. Power supply is a major concern in polytechnic communities. It is of no doubt that the provision of power supply is a technical need which is crucial and important to the existence, growth and development of the digital library because technological devices need electrical power supply to function. Therefore, there must be consistent and adequate power supply in the oil and gas polytechnics. Ekowe community where the Federal Polytechnic of Oil and Gas, Ekowe is cited, is not yet connected to the national power grid. As a result, it causes over burdening of the generators, in terms of fueling and maintenance.

##### 2. Low budgetary funding:

Ezekwesili (2006) cited in Famade and Omiyale [14] observed that underfunding of education especially at the tertiary level has become a persistent occurrence in Nigeria as funds released to the tertiary sector can no longer meet the increasing demands and growth of Nigerian tertiary institutions. Poor budgetary funding



however affects both capital projects and recurrent expenditures in tertiary institutions in Nigeria. The Federal Government of Nigeria is increasingly finding it difficult to meet the high cost of funding tertiary education in Nigeria and if tertiary institutions in the country are to survive, there is an urgent need to seek out means of improving their funding. It is instructive to note that education is a right and not a privilege and if this is to become a reality in the Nigerian context, then education needs to be subsidized and better funded at the tertiary level [15]. Facilities in most public institutions (primary and post- primary) are either dilapidated or out-of-date. Students do not have access to modern facilities [16]. Undoubtedly, the implementation of digital library is very much subject to the budgetary allocations of the polytechnics because there has to be constant and consistent maintenance of equipment and digitization of materials from analogue state to digital state all of which involve money and should be adequately budgeted.

These oil and gas polytechnics should be seen as priority funding institution due to their peculiar terrain because the cost of running them is quite enormous.

### **3. Material Collections**

Use of IT in libraries can broadly be grouped into two main categories: Creation of information, knowledge and its dissemination and communication to the end user. Second aspect of it is related to the in-house processes and activities of libraries [17].

Once there is a gap in the collection of materials, it will reduce the effectiveness and productivity of the library. Existing book materials could be converted to digital format through a systematic approach which includes procurement of high-powered Optical Character Recognition (OCR) machines and software. This will strengthen the digital library collections.

### **Recommendation**

The following recommendations are suggested to aid oil and gas polytechnics and other related institutions in the proper setup and establishment of digital library

1. The Federal Government through the Federal Ministry of Education and the National Board for Technical Education (NBTE) should initiate a policy that will enable the Petroleum Trust Development Fund (PTDF) to carryout oversight functions in the polytechnic. These oversight functions should include and not limited to;
  - i. Yearly Library interventions: Due to its nature for acquisition of recent materials, the library needs consistent and purposeful interventions. This will ensure that the digital library will continue to function as required and also create avenue for successful digital library implementation. These interventions could be broadened to cover acquisition of computer systems, backup power supplies, high-speed internet subscriptions and procurement of OCR digital equipment for conversion of book to digital materials amongst many other noble projects.
  - ii. Infrastructural development: There is a need for upgrading of digital library infrastructural facilities from time to time in the polytechnics. It would be in the interest of educational standard in polytechnics for PTDF and TETFund to take up the task of ensuring adequate and befitting infrastructural facilities in Oil and Gas polytechnics in Nigeria.
2. The Federal Government recently directed that all international oil companies operating in Niger Delta should relocate their headquarters to the Niger Delta region. This initiate is laudable and a welcome development. In line with this, the Federal Government should further pressure these oil companies to be actively involved in oil and gas institutions through subventions for diesel to power turbine generators in the institution and other related interventions. The Ministry of Niger Delta and Niger Delta Development Commission (NDDC) should all be made active partakers in the development of the oil and gas polytechnic.
3. Budgetary Funding to the Polytechnic should be urgently reviewed to avoid breakdown of educational and economic activities in the polytechnic.
4. Training and retraining of staff for library digitization should be constantly done and all required staff to achieve a sustainable digital library should be well motivated. A staff that is not trained in his duties will inevitably pull down any existing structure overtime.



5. School Authorities of Oil and Gas Polytechnics and other related institutions in the Niger Delta could setup a partnership-based digital library that will enable students across these institutions have access to online materials and improve productivity.

### Conclusion

The digital library provides huge support for inclusive learning as it brings a whole new dimension to research. Imploring its usage in our oil and gas institutions will create an environment where well-groomed technologists and technicians who will provide local content participation in the oil and gas sector (upstream and downstream) will be produced and further increase the educational standard of our nation.

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