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Activities of ICT (information and Communications Technology) Practice at The Federal University of Petroleum Resources Effurun (FUPRE) 2015 – 2020

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ABSTRACT

In some university environment in a developing country, ICT is sometimes viewed as nice to have, rather than as being critical for research, teaching and learning; but this a big mistake which will lead such an institution to lose out completely in the technological world. ICT is the window to Mega world Information System and according to the European Commission statement, no developing country can catch up with the developed ones without investment in ICT. This paper presents a brief history of ICT Unit and her activities at the Federal University of Petroleum Resources Effurun (FUPRE) Nigeria between 2015 and 2020 and shows that some progress can be made despite acute shortage of funds.

Keywords - ICT, Developing Country, University, Nigeria, FUPRE.

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1. INTRODUCTION

1.1 Definition of ICT

Information and Communications Technology (ICT) has been defined by House (2017) *as "an umbrella term that includes any communication device or application, encompassing: radio, television, cellular phones, computer and network hardware and software, satellite systems and so on, as well as the various services and applications associated with them, such as videoconferencing and distance learning"*

What this statement means in terms of a University environment is that radios used by the Security department and others belongs to ICT; all the Televisions in various offices including those used in teaching, cell phones irrespective of the service provider; Computer systems including Desktop, Laptop, Embedded systems; Networks, Ethernet and Intranet, Software packages, e-books, e-library belongs to ICT; transmission of Information and communication signals via radios, microwave and satellite are part of ICT and so are the various video conferences and distance learning systems. What of computer assisted learning and testing systems; they all belong to ICT. .ICT is so vast that it is often spoken of in a particular context, such as ICTs in education, health care, or oil industry and so this paper will limit its scope to ICT in a university environment.

1.2 Importance of ICT

In some university environment in a developing country such as Nigeria, ICT is sometimes viewed as nice to have, rather than as being critical for teaching and learning; but this a mistake which will lead such institution to lose out completely in the technological advancement; see world Bank report (2002), WikiEducator (2007), Akubuilo(2007).

Newhouse (2002) and Ramboll (2004) have shown that ICT is in fact the window to Mega world Information System.

According to the European Commission:
"The importance of ICTs lies less in the technology itself than in its ability to create greater access to information and communication in underserved populations. Many countries around the world have established organizations for the promotion of ICTs, because it is feared that unless less technologically advanced areas have a chance to catch up, the increasing technological advances in developed nations will only serve to exacerbate the already-existing economic gap between technological "have" and "have not" areas. Internationally, the United Nations actively promotes ICTs for Development (ICT4D) as a means of bridging the Digital Divide"

2. ICT4D - INFORMATION AND COMMUNICATIONS TECHNOLOGIES FOR DEVELOPMENT

ICT4D (Information and Communications Technologies for Development) is an initiative aimed at bridging the digital divide (the disparity between technological "have" and "have not" geographic locations or demographic groups) and aiding economic development by ensuring equitable access to up-to-date communications technologies. As already stated, Information and communication technologies (ICTs) include any communication device -- encompassing radio, television, cellular phones, computer and network hardware and software, satellite systems and so on, as well as the various services and applications associated with them, such as videoconferencing and distance learning. The United Nations, through its UN Development Program, actively promotes ICT4D as a powerful tool for economic and social development around the world.

2.1 ICT in Nigerian Universities

The message is clear; neglect ICT and be ready to belong to be left behind. Akuegbe, et al, (2017) have shown that ICT availability and utilization in Nigeria Universities are very low; in fact they stated that "*The findings of this study have clearly shown that the availability of ICT facilities and university lecturers' utilization of ICT facilities are very low. This is a serious limitation to quality instructional service delivery in this ICT global age. With the impression ICT has created, it is yet to create significant impact in enhancing the quality of instructional service delivery of university lecturers in Akwa Ibom and Cross River State of Nigeria ICT facilities should be made adequately available by university administration such that lecturers can utilize them in their offices and classroom. This is necessary because ICTs are regarded as integral parts of teaching and research in universities".*

2.2 Brief History of FUPRE Information and Communication Technology (ICT)

Obi (2017) and Umolu (2017) reported that FUPRE ICT started in August 2009 with the pioneer Head of Unit (Mr. Jimoh Olalekan) and later two other pioneer staff (Dr. Ogunkeyede Akinyemi- (Academic Staff) and Mr. Kenneth Akposionu - (Non- Teaching Staff) were employed. It was seen as a servicing unit, offering ICT services to every other department in the University.

The first University VSAT – (A **Very Small Aperture Terminal (VSAT**), which is a two-way. satellite ground station with a dish antenna that is smaller than 3 meters) was installed in January 2010 at Eburumede (the University temporary site), and was activated on February 10, 2010. In March 20, 2011, it was relocated and mounted at the University permanent site. FUPRE ICT had a humble beginning and its development had not been free from the challenges which many such units in Nigerian Universities faced at their inception - Bassey et al (2007). In March 2012, additional 8 staff were employed to join the unit. At this junction, ICT was spilt further into 4 sections comprising of – Hardware, Network Administration, Web Development and System Analysis. In February 2016, ICT Unit became a Directorate with appointment of an acting Director Engr Dr. Godwin Ugwu. The Directorate's major achievement was the establishment of a brand new Computer Centre in 2019 capable of running on line Computer Assisted Learning (CAL) and Computer Based Testing (CBT) systems for hundreds of students with donated items only.

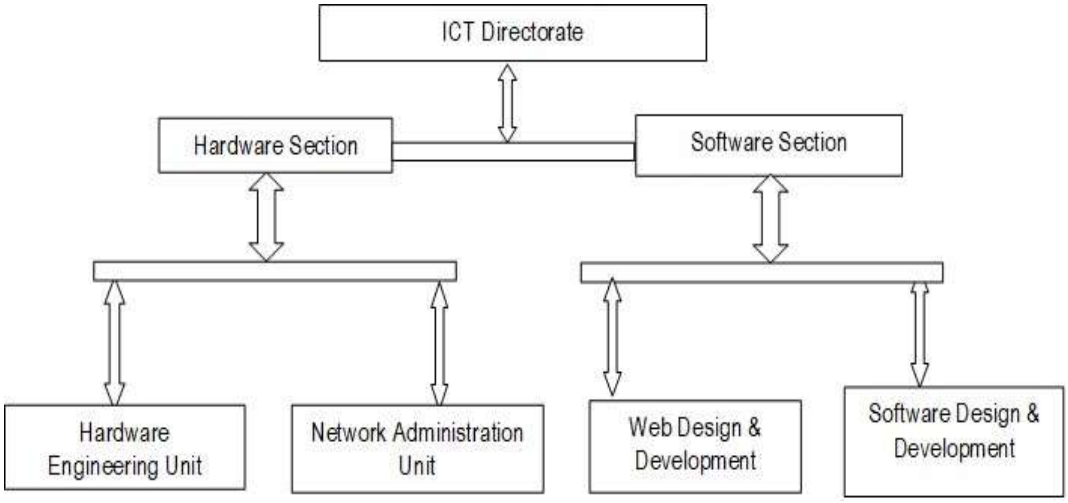

Figure 1. Structure of FUPRE ICT Directorate

For administrative purpose, the directorate was split into two main departments namely –

1. **ICT Hardware System Unit** - comprising of Hardware Engineering and Network Administration
2. **ICT Software System Unit** – comprising of Web Development and System Analysis

3. THE CURRENT CORE SERVICES OF ICT HARDWARE SYSTEM UNIT.

ICT Hardware System Unit is a servicing department that offers ICT services to the entire University Community but in future, it could be used for hardware system development. It has two sections – Hardware Engineering and Network Administration as illustrated in figure 1.

Hardware Engineering Unit – this unit is manned by three ICT staff and one support staff, they handle the repairs and maintenance of all ICT Infrastructures in the University, their services include –

- Computer Hardware Components Assembly and Installation
- Developing Technical Specifications for ICT Infrastructures
- Troubleshooting, Repair and Maintenance of Computers (Desktops and Laptops), Printers, Scanners and UPS etc.
- Virus Mitigation
- Data Recovery and Backup
- Utilities/Application Software Installation

Network Administration Unit – this unit has three ICT staff and their services to the University include –

- Provision of Internet services
- Design, Implementation and Maintenance of University Area Network and Internet access.
- Maintenance of the University Servers.
- Support services to both staff and students

The ICT Software Systems Unit (ICT SSU) is made up of the Systems Development and the Web Development sections as illustrated in fig 1.

4. CURRENT SOFTWARE PROJECTS

The ICT SSU has developed several system and web based applications to automate and simplify several important task in the University. Examples of such applications include;

- **Staff and Students identity management system** (This in house system that has saved the University several millions of Naira as the identity management system supplied by a contractor has since failed and the Unit had to come to the rescue)
- **Students Record management** (This web based system has simplified the process of applicants data acquisition, and helped to improve the admission process for all academic programmes in the University)
- **E-Results Management Systems** *(This is an intranet based results computation and transcript generation system)*
- **The University Website** (The Website which is continuously being improved upon has helped in the dissemination of information about the University to the outside world)
- **Staff Data Management** (The FUPRE Enterprise Resource Planning system has made it possible for staff data to be collated and managed electronically thereby saving the money which would have been wasted on paper)
- **University Email System** (This email system that was put in place without any financial burden on the University has helped to serve as a channel of communication among staff and as a *channel of information dissemination to categories of staff or all staff in general)*
- **Students Online Registration**
- **Online Payment System** (Until the recent introduction of the REMITA payment gateway system, all school fees payment records were managed on the FUPRE Enterprise Resource Planning system)
- **Web-based Staff Profile and Publication Repository** (This tool is an important part of the University website content which was deployed to enable staff showcase their publications and achievements for the entire world to see)

4.1 Some Projects executed at FUPRE
Software Unit

Re: Request For Submission Of Report Of Activities And Accomplishments From May 4, 2015 Till March 14, 2020

As directed below is the activities in ICT software unit, there are two sections under software unit namely – System Analysts and web development.

1. **System Analysis section** is in charge of the University enterprise resources solution called **FERP,**

Objectives of **FERP**

- Share Information accross the institution
- Process Automation
- Instant dissemination of information
- Real statistical analysis of data
- Accurate data
- Paperless environment

The **FERP** software as today covers –

FERP Payroll
A module of the ERP which computes payroll, categorize staff, generates reports and send payslips to staff.
This module involves the following:

- Salary structure
- Staff profile
- Variations
- Payslip management
- Payroll
- Reports

FERP Expenditure control
This module automates and generates diverse statistical analysis of budget and expenditure. Marries departmental budget, expense head budget with their budgets.
This involves:

- Budget
- Departmental Expenditure
- Fund Control
- Approvals
- Budget Performance

FERP Health

- Health Records
- E-Medical Examinations
- Lab Request
- Lab Test Records
- Duty schedule
- Drugs Inventory

FERP Fixed asset

Record taking, automation and reporting of all fixed assets within the institution.

- Asset Registration
- Depreciations
- Asset Improvements
- Asset Disposal
- Net Book Values
- Reports

FERP CBT e-learning

- Setting pool of questions
- E-testing
- Result Generation
- E-lecture note
- E-continuous Assessment
- E-exercises
- E-library

FERP HR

- Profiling
- File and Documentation
- Transfers
- Leave Management
- Promotions
- Terminations and suspensions
- Trainings
- E-memos
- Newsletters

Web Development Section is in charge of the University Portal , this includes – e payment, registration, and support to students the portals are –

Basic (Pre-degree portal)
Foundation Portal
Student Portal
Postgraduate Portal
Center for Maritime and Off-shore studies Portal
Center for Safety Education Portal
Vocational and Entrepreneurship Center

4.2 Hardware Unit

Status Report On The Activities Of The Ict Hardware Systems Unit For The Period Of May 4, 2015 To March 14, 2020.

The following are routine tasks that we carry out from day to day, and are common to all months and quarters of the year.

Routine Tasks

- Provision of day to day support to staff on hardware systems, maintenance and installation, and the installation of antivirus.
- Provision of Audio-Visual facilities for lectures, meetings and other events.
- Monitoring and resolution of staff internet connectivity issues.
- Granting of internet access to new staff and students

The Period May 2015 to December 2015

- Took delivery of Tertiary Education Trust Fund TETFUND supplied Sukam 3.5kva Inverter with 4 batteries.
- Monitored Compliance and supervised data/voice connection at the new Petroleum Laboratory building.
- Commenced printing of Staff and Students ID cards with new internally designed templates after the Contractor supplied facilities failed.

The Period January 2016 to June 2016

- Took delivery, and oversaw the installation of TETFUND supplied Electronic teaching boards and accessories.
- Organized training for lecturers on the use of the TETFUND supplied Electronic teaching boards.
- Redesigned the University Optical Mark Reader OMR answer sheets for the conduct of Post UTM Examinations.
- Participated in the conduct and mark of OMR scripts for the 2015 Post UTM Examination.

The Period July 2016 to December 2016

- Improved the intranet connection within the University.
- Invited Telecommunications companies to an interactive session with the University management with respect to the possibility of internet bandwidth provision.
- Facilitated the repair of the only ID card printing machine and saved the University about N800,000.00 which it would have cost to procure a new one.

The Period January 2017 to June 2017

- Arranged and facilitated the profiling of staff on the University Website.
- Organized training for lecturers on the FUPRE E-Result Computation System on the 17/5/2017.

The Period July 2017 to December 2017

- Compiled an asset register of all ICT items in the University.
- Participated in the conduct and mark of OMR scripts for the 2017 Post UTM Examination.
- Design and provision of ID card for Basic, Foundation, and Centre for Safety Education students.

The Period January 2018 to March 2018

- Organized a Workshop and Trained FUPRE staff on internet usage.
- Monitored Compliance and supervised data/voice connection at the new Petroleum Laboratory building.
- Reconnected the FUPRE University library to the FUPRE network.
- Configured and installed two access points at College of Technology and TETFUND Block B building.
- Troubleshot and reinstalled malfunctioning repeaters around the University.

The Period April 2018 to June 2018

- Provided support and resolved complaints of intercom users at the University Administrative Building.
- Monitored the Setting up and arrangement of 50 new chairs and 100 new tables at the ICT Learning Resource Centre.
- Participated in the conduct of the Post UTME Examination.
- Provided venue and ICT facilities for the Rural Electrification Agency Workshop for FUPRE students.

The Period July 2018 to September 2018

- Facilitated the procurement of electrical Extensions required in the ICT lab for the upcoming training on Network Usage.
- Supervised the installation of Nigerian Communications Commission (NCC) supplied Wireless Cloud Internet Project items.
- RADIUS Server database was restored once after it was lost due to power failure

The Period October 2018 to December 2018

- Granted internet access to 132 students and 4 staff.
- Compiled FUPRE ICT Asset Register
- Verified specification of computers supplied to the University
- Monitored Internet availability and functionality, and asked the Network Administrators to take appropriate action when necessary.
- Monitored the provision of ICT Hardware maintenance support to staff of the University.
- Provided support the ICT Director on ICT Hardware related tasks.

The Period January 2019 to March 2019

- Took delivery of, and deployed 95 computers at the ICT Learning Resource Centers.
- Procured and deployed security locks for 95 laptop computers at the ICT Learning Resource Centers.
- Provided support and packaged computer laptops for UNIDO staff inspection in the company of the Deputy Vice-Chancellor Administration.
- Supervised the modification of Computer Tables to make them suitable for external CBT Examinations.
- Provided support and participated in the test of the ICT Directorate developed CBT Software.
- Provide support for events, with the aid of visual/audio equipment provision.

The Period April 2019 to June 2019

- Supervision of corrective maintenance on the Info-Tech Reprographics Machine at the Pro-Chancellor's office.
- Installation of 95 laptops and 20 Thin Client Computers as part of the setup of the ICT Resource Centers for the forthcoming Post UTM CBT examination.
- Provision of Audio-Visual support for the 2nd and 3rd Inaugural Lectures.
- Facilitation of Workshop on the Sensitization of Staff on ICT Hardware Maintenance Services and on Available intranet and internet facilities and Services.
- Technical verification and installation of 20 HP Desktop computers supplied to the Procurement Unit.

- Receipt and installation of Zonal TETFUND Intervention Grant Interactive Electronic Whites Boards.
- Reactivation of internet connection at the College of Technology.
- Replacement of Internet Router equipment at the College of Science Building.
- Network equipment routine maintenance at the Administrative Building, College of Science Building, College of Technology Buildings.
- Registration and granting of internet access to new users, and the provision of day to day support to staff on internet connectivity.

The Period July 2019 to September 2019

- Supervision of corrective maintenance on the Info-Tech Reprographics Machine at the Pro-Chancellor's office.
- Installation of 95 laptops and 20 Thin Client Computers as part of the setup of the ICT Resource Centers for the forthcoming Post UTM CBT examination.
- Provision of Audio-Visual support for the 2nd and 3rd Inaugural Lectures.
- Technical verification and installation of 20 HP Desktop computers supplied to the Procurement Unit.
- Provision of day to day support to staff on hardware systems maintenance and installation, and the installation of antivirus.
- Receipt and installation of Zonal TETFUND Intervention Grant Interactive Electronic Whites Boards.

- **The Period October 2019 to Date.**
- Participated in the preparation for and the conduct of the 2019 Post UTM Examination.
- Facilitation of Workshop on the Sensitization of Staff on ICT Hardware Maintenance Services and on Available intranet and internet facilities and Services.
- Replacement of Internet Router equipment at the College of Science Building.
- Network equipment routine maintenance at the Administrative Building, College of Science Building, College of Technology Buildings.
- Achieved 95% completion of the installation of Zonal TETFUND Intervention Grant Interactive Electronic Whites Boards along with fabricated accessories security lock-up cages.
- Participated in the ICDL ICT Training from 09/12/19 to 13/12/19.

5. FUTURE PLAN (Year 2020 to 2030)

Information and Communications Technologies (ICT) should support FUPRE to reach strategic goals in both education and research and to enhance the student experience.

Key numbers for standard ICT equipment and systems;

- Over 100 servers should be supported.
- NgRen 155 Mbbs minimum bandwidth
- Over 100 Terabyte of storage in the Data Centres should be provided.
- 200 sites on the Linux web farms.
- 28 sites connected to our self-managed network.
- Three supercomputers within the Computer Centre.
- 5,000 tablets to be supported.
- 100 virtual desktops.
- 300 Macs.
- 300 printers to be supported.
- 5,000 SharePoint sites – 25,000 page views per day.
- 50 TB of mirrored Panopto data.
- Expansion of the two colleges is expected to bring in 50 new Blackboards.
- 5,000 student access desktops across 150 managed computer rooms.
- 3,800 staff mobile devices (notebooks, laptops etc.).
- 1,000 different applications across various buildings.

What ICT will do if financially supported

Connected

FUPRE ICT will set up user accounts for staff, students and guests that provide access to University's IT resources. Behind the scenes ICT will be busy managing the complex network cabling, hardware and software that allows staff and students to access ICT services in person or via the network.

Keeping in touch

Our web developers will assist ICT central Communications team in maintaining and improving the website. Additionally ICT will support systems, including NgRen, Microsoft Lync and SharePoint, that aid collaboration and communication across campuses and externally.

Customer service

ICT will support online service desk systems across University, including on-line request, for reporting and tracking requests and faults. Our ICT Service Desk will be open from Monday to Friday, responding to reports and calls for assistance. ICT Faculty will Support teams based across Colleges to respond to reports in person.

Teaching and learning

FUPRE ICT will support and develop University's virtual learning environment, Blackboard, and other systems that enhance courses and tutor feedback. ICT will also support and upgrade audio visual equipment across shared teaching spaces, including those supplied by TETFUND, which offers filmed lectures to students.

Student experience

ICT will always be keen to work with and hear from students and run many student-led forums to facilitate the sharing of information and opinions. ICT will maintain over 3,000 PCs across 60 teaching and learning spaces at FUPRE. ICT will support over 150 multipurpose scanning, photocopying and printing machines with a simple pay-to-print payment system using a University campus card, in addition to a mobile printing service.

Enabling research
ICT will provide and develop multiple data management systems that support University's advances in various fields of research. The High Performance Computing (HPC) service will use state-of-the-art computational techniques and hardware to support breakthroughs in areas from science, engineering to oil and gas research.

Value for money
ICT will provide the University with sustainable, reliable, high quality hardware and software. ICT will set up CBT centre for WAEC, NECCO and JAMB, establish Shop that offers a range of discounted and free software packages for staff and students and will provide university-wide access to tools from assisted technology software to mobile apps.

Managing data
ICT will maintain, enhance and support core university systems to handle administrative and research data. The FUPRE ICT will host over 300 servers along with the central High Performance Computing (HPC) suite.

Staying secure
To protect FUPRE ICT users from the risks associated with unauthorised access, alteration and attacks, ICT Security Team will monitor the processes and policies that protect the integrity and security of University's systems and equipment.

6. CONCLUSION

This paper has presented a comprehensive record of the progress made to establish a local ICT unit and stated how Information and Communications Technologies (ICT) should support the University to reach strategic goals in both education and research and to enhance the student experience. It has listed the equipment needed and the regrets if no initiative is taken to make urgent investment in ICT.

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