



## Research Data Management and Information Security:

### Role of Library and Information Technology Service (ITS) Units in Federal Universities of Technology in Nigeria

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**Abstract**—This exploratory study presents how information security affects research data management in all the federal universities of technology (FUTs) in Nigeria. These FUTs in Nigeria are: the Federal University of Technology, Minna; Federal University of Technology, Akure; Federal University of Technology, Owerri; Modibbo Adama University of Technology, Yola; and Abubakar Tafawa Balewa University, Bauchi. Lack of trust in the available security systems and safety procedures guiding the institutional repositories (IR) have been identified as perceived impediment to depositing intellectual outputs and the underlying research data by researchers. The consequence of this is poor patronage of the IR and low content of repositories of FUTs in Nigeria. The objective of this study was therefore to identify the available support systems in the Libraries and Information Technology Service (ITS) Units of FUTs in Nigeria. The study used oral face-to-face semi-structured interview method conducted on five university librarians and five heads of ITS Units of FUTs in Nigeria who are responsible for the development and management of institutional repositories and are also stakeholders in effective research data management. For the data transcription and analysis, this study adopted the Braun & Clarke (2006) thematic analysis approach which involve a six-phase of qualitative data analysis. Findings of the study confirmed that hacking, as a cyber threat, still pose a great threat to intellectual output and research data deposited in the IR of FUTs in Nigeria. The study recommended the need for continued capacity building to improve the cyber security skills and data management skills of ITS staff and librarians respectively.

**Keywords**—research data; research data management; federal universities of technology; information technology service; library; information security; cyber security; hacking; Nigeria

## I. INTRODUCTION

Research is a systematic enquiry towards answering a question or unravelling mysteries around a particular phenomenon. Research outputs are results of such enquiries accepted within a scientific community to be able to better human life and the society. Research, as further seen by [1], forms the basis for academic productivity, which is seen as

the measure of the required output expected of an academic staff. A well conducted research will project not only the image of the researcher but also of the institution the researcher is affiliated to. Furthermore, academic research is considered to be efficient and socially valuable if it offers solution to real problems that companies and/or individuals confront [2]. Most researches are achieved through collating and analysing of recorded data over a period of time.

Data are collection of facts, concepts, numbers, words, measurements, observations, or instructions in a formalised manner which should be suitable for communication, interpretation, or processing by human or electronic machine. Data that are collected and presented in a form that the computer system can understand are referred to as digital data. Data vary across disciplines; they can be numeric, textual, audio, video, and graphic. They can also be samples (such as Deoxyribonucleic acid (DNA), blood), physical collections (plant specimens, animal samples), software codes and programmes, algorithms, geospatial data, databases, modules, reports, experimental observations, survey results and interview transcripts, instrument measurements, laboratory notebooks, to mention but a few. Hence, data generated during the conduct of any research for the purpose of sharing and reuse is known as research data.

Research data cover a broad range of types of information and digital data can be structured and stored in a variety of file formats. Pienaar & Van Deventer [3] defined research data as the recorded factual material commonly accepted in the scientific community as necessary to validate research findings. They are data collected, observed or created for the purposes of analysis to produce and validate original research results. Research data can be in the form of facts, observations, images, computer program results, recordings, measurements or experiences on which an argument, theory, test or hypothesis, or another research output is based [3]. Research data are valuable products of the scientific enterprise that historically have not been well preserved or archived. International sponsors and scientific journals are now encouraging or requiring sound data management and data sharing before granting fund or accepting article for publication indicating how critical