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ADOPTION OF ARTIFICIAL INTELLIGENCE FOR LIBRARY OPERATIONS IN FEDERAL UNIVERSITY LIBRARIES IN NORTH WEST STATES OF NIGERIA

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ABSTRACT

The study investigated "Adoption of Artificial Intelligence for Library Operations in Federal University Libraries in North West States of Nigeria". They research objectives was to; find out the types of AI technologies available for library operations in Federal University Libraries in North West States of Nigeria. A quantitative method was adopted. Total enumerative sampling was used in the study with 73 respondent which comprises of the ICT Staff in the seven University libraries in the North Western States of Nigeria. The instrument for data collection was questionnaire developed by the researcher. Data collected was analysed using descriptive statistical analysis. The findings from the study revealed that; the types of AI technologies available in University libraries in North West States of Nigeria were: Social media, Online Public Access Catalogue (OPAC), search engines, security scanner. The study conclude that the University libraries in North West States of Nigeria have not adopted many AI technologies in their libraries despite the potential it has on library operations. The study recommends that there is need for the University libraries to adopt more AI technologies like robots, book delivery drone, RFID, library smart card among others.

INTRODUCTION

Technology plays an important role in contemporary society worldwide. It has touched all aspects of human lives which include Health, Education, Communication, Transportation, Banking, Agriculture and Library and information services. Libraries and information services in academic environment are not left out in this technological advancement. Librarians are therefore expected to modify their working relations, process and service delivery to their users. They should not count how many users come to library but rather they should be concerned with reaching out to users as well as satisfying their needs through technologies. At the same time, as population grows, their expectations of what they want from library change. As modern librarians, there is need to find out the emerging technologies that can improve, enhance and facilitate information service delivery in our respective libraries. The rapid advancement in computer technology and software applications have lead to the era of fourth industrial evolution (4IR) which brought about emerging/disruptive technologies including Artificial Intelligence (AI). The term AI was coined by John McCarthy, an American computer scientist, in 1956. He defined it as "the science and engineering of making intelligent machines" (Valluri, 2017). AI has grown to be popular in today's world. It is conceived as the simulation of natural intelligence in machine programmed to learn and mimic the actions of human like task. Machines programmed to carry out tasks requiring human intelligence, thus are said to possess AI (Omame, 2020). AI is the technology that enables machines to have the abilities to plan, learn, reason, solve problems, move and be creative to some extent.

Artificial intelligence is already part of our daily activities, most computer systems and mobile phones being developed today have AI features in them. These include many others: Facial recognition for surveillance and security system; selfless driving cars, keyless cars; Carbon emission tracker drone; Chatbot now the newer version known as ChatGPT ; Audio, Video, Text applications; Remote controls are no longer needed to control most of home appliances we now talk or give command and they respond (Smart home appliances) such as Television, Air condition, Curtains, Doors, Lights among others; Thumb printing machines; Virtual travelling booking agent; Google maps; Ride sharing applications Such as Uber, Lyft, Bolt; Spam filters on E-

mails; Plagiarism checkers on tools; Smart personal assistants such as Siri, Alexa; Closed circuit television (CCTV) camera; Security scanner among others.

It could therefore be said that AI involves a variety of areas such as Natural Language Generation and Processing, Speech Recognition, Machine Learning, Deep Learning Platforms, Biometrics, Robotics, Data Mining, Computer Vision, Cognitive computing, Neural networks, Text analytics, Image processing Character Recognition, and Expert System (Ajay, 2018). Library and information science has also advanced in using intelligent system, AI is the current technology that has evolved with huge prospect and promising applications in libraries. AI are less prone to errors, unlike human beings; they can work for 24 hours/7 days without getting tired, there by freeing the librarians to do other jobs. AI are much faster than human in terms of speed therefore can assist library clientele who are carrying out research by combing library database in an instant thus making the search much faster getting clientele the information they need right away (Omame, 2020). Ultimately, since AI can operate efficiently at a scale and speed beyond human abilities, it will maximize speed, efficiency and effectiveness in processing library and information resources and enhance library services delivery at all levels. Hence, in order to increase efficiency and effectiveness, many libraries are moving toward automation of their activities, AI techniques give more accuracy to the automation of libraries (Dwivedi et al., 2013).

Statement of the Problem

In order to evolve in line with the Fourth Industrial Revolution (4IR), some libraries in Subsahara Africa adopted AI which includes University of Pretoria Library South Africa, they acquired their humonid robot in 2019 and called her Libby and use it as an added benefits that enhances its service portfolio. University of Lagos Library Nigeria also adopted AI, they acquired their humonoid robot in the year 2020 in order to provide efficient service to their users (Echedom & Okuonghae, 2021). The adoption and use of AI in Nigerian and African libraries at large remain very poor (Lund et al, 2020). There is need for Nigerian libraries to improve on adoption of AI.

Research Question

What types of AI technologies are available for library operation in Federal University libraries in North Western States of Nigeria?

Objective of the Study

To find out the types of AI Technologies that are available for Library operations in Federal Universities Libraries in North Western States of Nigeria

Research paradigm

The research paradigm that will be adopted for the study will be positivism. Therefore, the study will guided and underpinned by positivist research approach. This approach considered appropriate and adequate owing to the adoption of quantitative research method research approach in the study positivists are of the opinion that social events are controlled by universal laws, and ability of a researcher to discover these laws will determine how he or she can describe, predict and control social phenomena"(Tuli, 2011). According to Wahyuni (2012), in the positivist approach it is assumed that if different researchers are observing the same factual problem and using a large sample, they are expected to eventually get a similar result provided that they a carefully use statistical test and employ a similar research process in their investigation.

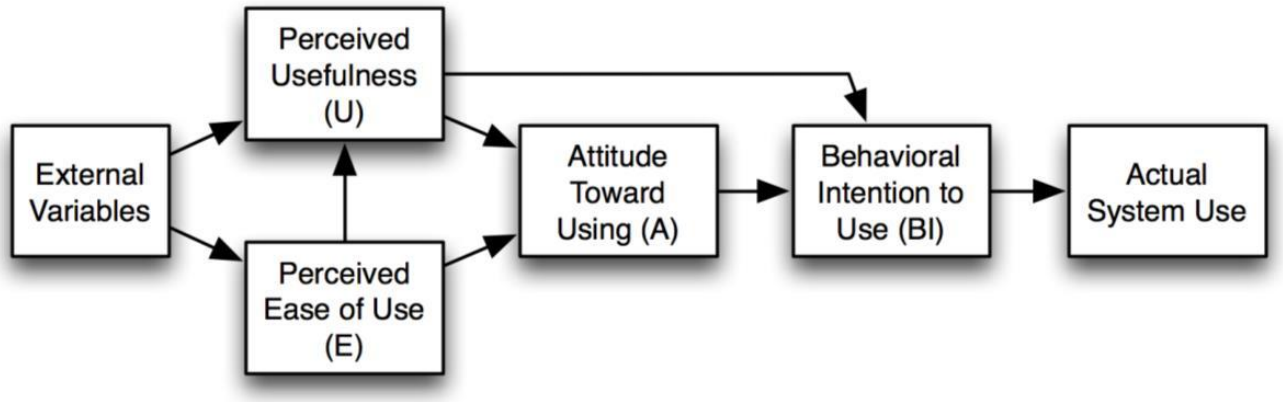
Theoretical Framework

Technology Acceptance Model, TAM

In this study Technology Acceptance Model (TAM) was adopted, technology acceptance model (TAM) is designed to measure the adoption of new technology based on customer/user attitudes,

This model introduce factors and variables to identify the technology acceptance by users. The models can be used to measure and investigate the degree of technology acceptance by the users.

Figure1



BI = A + U
A = U + E
U = E + External Variables
E = External variable

As presented in Figure1, perceived usefulness and ease of use impacting the attitude of the user. The attitude toward using shows the degree of favorable or unfavorable toward the technology/information systems. "Perceived usefulness is the degree to which an individual believes that using a particular system would enhance his or her job performance. Perceived ease of use is the degree to which an individual believes that using a particular system would be free of physical and mental effort." (Davis, 1986). The technology acceptance model (TAM) is an information system theory that models how users come to accept and use a technology. The actual system use is the end point where people use the technology. Behavioural intention is a factor that leads people to use the technology. The behavioural intention is a factor that leads people to use a technology. The behavioural intention (BI) is influenced by attitude (A) which is the general impression of the technology. The model suggests that when users are presented with a new technology, a number of factors influence their decision about how and when they will use it.

TAM, posits that there are two factors that determine whether a technology will be accepted by potential user:

1. Perceived usefulness
2. Perceived ease of use.

The key feature of the model is its emphasis on the perceptions on the potential users. That is while the creator of a given technology product may believe the product is useful and user friendly, it will not be accepted by its potential users unless the user share those beliefs.

Perceived usefulness (PU): This was defined by Fred Davis as "the degree to which a person on believes using a particular system would enhance their job performance". It means whether or not someone perceives that technology to be useful for what they want to do.

Perceive ease of use (PEOU): Davis defined this as "the degree to which a person believes that using a particular system would be free from effort" (Davis, 1989), if the technology is easy to use then the barriers conquered. If it is not easy to use and the interface is complicated, no one has a positive attitude towards it. External variables such as social influence is an important factor to determine the attitude. When these things are in place, people have the attitude and intention to use the technology However, the perception may change depending on age and gender because

everyone is different. The variable/construct of the theory will guide this research in addressing the specific objectives of the study. The basic premise of TAM is when users perceive that a new technology is proposed they will be motivated to either accept or reject such technology.

Descriptive Statistical Analysis

The researcher adopted average benchmark of 50% response score as the minimum score for acceptance as being significant. A response score below the average benchmark of 50% is not accepted. The data collected concerning the research question raised is analysed and discussed in the subsequent sub heading.

Types of AI Technologies a Available for Library Operation in the Federal University Libraries in North West States of Nigeria

Data on the types of AI technologies available for library operation in the Federal University libraries were collected. Frequency, percentage were used.

Types of AI Technologies Available for Library Operation in the Federal University Libraries in the North Western States of Nigeria.

Types of AI Technologies in Federal University Libraries										
S/N	**AI Technologies in University Libraries**	**KIL**	**AFLC**	**BUKL**	**FUFL**	**FUDL**	**FULG**	**FUBL**	**F**	**%**
1	Social Media	18	06	08	05	04	06	05	52	78.8 %
2	Online Public Access Catalogue (OPAC)	21	07	07	04	03	07	07	56	84.8 %
3	Cloud Computing	02	00	01	02	01	03	00	9	13.6 %
4	Search Engines	15	04	06	05	04	06	04	44	66.7 %
5	Barcode	21	02	03	05	00	01	00	32	48.5 %
6	Security scanner	19	04	04	05	03	04	04	43	65.2 %
7	Academic Integrity and Plagarism	23	07	08	08	03	05	04	58	87.9 %
8	Library Management Software	20	07	09	07	04	07	07	61	92.4 %
9	Closed Circuit Television(CCTV Camera)	09	01	01	02	01	02	03	19	28.8 %
10	ChatGPT	23	06	06	06	04	05	04	54	81.8 %

Key=**KIL**- Kashim Ibrahim Library
AFLC- Abdullahi Fodio Library Complex
BUKL- Bayero University Kano Library
FUFL- Faruk Umar Faruk Library Federal University Dutsen-ma
FUDL- Federal University Dutse Library
FULG- Federal University Gusau Library

FUBL- Federal University Birnin Kebbi Library

The Table presents the analysis of AI technologies available for library operations in the Federal University libraries in North West States of Nigeria revealed varied landscape across different types of technologies. It is clear from the table that stand out with the highest response score of 92.4%. Additionally, all the AI technologies mentioned on the table have response scores above the acceptable bench mark of 50% except Barcode System which is slightly below response score of 48.5% , robots has the lowest response score of 6.0%. Cloud Computing, CCTV camera, biometrics, smart library card, book delivery drones all fall are below the bench mark of 50%. Hence, they are not accepted as the types of AI technologies generally in the Federal Universities in North West States of Nigeria. From the fore going it can be concluded that the Federal Universities in North Western States of Nigeria have different types of AI technologies such as Social Media, Online Public Access Catalogue (OPAC), Search Engines, Security scanner, Academic Integrity and Plagarism, Library Management Software, ChatGPT. This analysis underscores both strengths and areas for development in the integration of AI technologies within Federal University libraries. This emphasized the importance of continued investment and strategic planning in enhancing library operations. The findings of this study are consistent with similar study of Saibakumo,(2021) who found the types of AI technologies in Nigerian Libraries as being social media, plagiarism checker, Library Management Software, ChatGPT, OPAC among others. The findings also agreed with that of (Berdasco et al., 2019) who found that 99% of the libraries in Nigeria were aware of the existence of the various AI technologies used at least one. These findings collectively reflect a strategic approach towards leveraging AI technologies to streamline library operations and enhance academic services. Also, the findings also highlights potential areas for improvement or increased investment to harness the full potential of these technologies in optimising library operations. Furthermore, while AI technology like biometrics is slightly below the benchmark, there remains room for enhancement, indicating a need for further integration or optimisation to fully exploit their benefits for library operations. This analysis underscores the importance of a comprehensive approach towards AI technology integration in Federal University libraries thereby emphasizing the need for ongoing investment and strategic planning to address both strengths and areas for development in AI technology integration especially in library operation.

CONCLUSION

The types of AI technologies available for library operation in the Federal University libraries studied are Social Media, Online Public Access Catalogue (OPAC), Search Engines, Electronic Resource Management, Academic Integrity and Plagarism, Library Management Software, and ChatGPT. Hence, it can be concluded that if the all the challenges adoption of AI were addressed it will enhance the efficiency of library operations it would encourage the library management to provide increased resource and infrastructure

RECOMMENDATION

The Library management should integrate more AI technologies in their various libraries such as barcode, cloud computing and CCTV Camera, they should also incorporate stronger AI technologies like Augmented reality, Book delivery drones, library smartcard, Robots, Radio frequency identification (RFID), Intelligent Federated library search among others. Additionally, the libraries should regularly update staff on advancements and new features to maximize utilization.

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