Fourth Industrial Revolution and University Libraries; A Nexus of Skills and Training Readiness In Nigeria.

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Abstract

This study examined the readiness of university libraries in Nigeria for the fourth industrial revolution from skills and training perspective. Literature was reviewed on the current digital skills possessed, existing digital skills training programme and the challenges of training and skill for Nigerian university library staff in the fourth industrial revolution. Findings revealed that there is a low level of digital skills and competence to function in this era. The training available is to enhance basic digital skill and no available training or sign of preparation for the advance digital skills required in the fourth industrial epoch and some of the challenges found were poor funding of libraries which further cascades into poor staff development programs and poor ICT infrastructure. Also, obsolete library schools' curriculum and lack of skilled staff to teach new skills on the emerging technology was identified.The study concluded that university libraries in Nigeria are at the level of preparedness in terms of awareness and skills assessment towards the fourth industrial revolution and there is a need to learn new competencies and engage in continual training to acquire the new skills required. The following recommendations were made: Information professionals and university library management should improve on staff training and continuing professional development. The Nigerian library schools' should revise the curriculum and encourage inter-faculty collaborations where there is skill and competency deficits.
Keyword: Fourth Industrial revolution, University Library, Skills, Training

Introduction

Human society has evolved in phases over the years. There have been discussions by creationist around the creation of human with the belief that man evolved from being Homo sapiens, in some other quarters, there have been debates about the stand of the bible about creation and how the first set of humans emerged, the creation of Adam and Eve in Genesis and further arguments around the Charles Darwin theory of evolution. Human activities at that time were mainly gathering, agrarian and hunting (Ruse, 2022). It was postulated by Charles Darwin in a seminar work that human activities will transform from primitive practice to industrial society. (Darwin, 1859) and this gave birth to the first and second industrial revolution. These transformation phases birthed social and economic growth especially in industrial production of raw materials and agricultural products which were later accelerated by innovation and technology. Futurists also envisage a third industry or a third wave. A society that will be driven largely by information and knowledge, a network and paperless era (Toffler, 1991 & Castells, 1996)

Klaus Schwab, the chairman of the world executive forum at the convention in Switzerland came up with the concept of the FOURTH INDUSTRIAL REVOLUTION. He chronicled the previous phases of industrial revolutions, the First Industrial Revolution which used water and steam power to mechanize production. The Second revolution used electric power to create mass production and the third wave used electronics and information technology to automate production. The Fourth Industrial revolution builds on the third revolution with the use of technology to blend the physical, digital, and biological spheres" (Schwab, 2015; 2017). Kamble et al. (2018) enumerated the technologies that characterize Industry 4.0, to

include Internet of Things (IoTs), big data analytics, cloud computing, augmented reality and robotic systems, simulation prototypes and 3D printing. The reality of the 4ir in with us, the driver-less Elon Musk tesla cars are on our roads, automated bank tellers (ATMs) are in our shops, Virtual reality is playing key roles in sport(football), drones are very helpful with logistic, media/photography and military, Robert are to be deployed to war by the US government, blockchain has better enhanced cryptocurrency (Bitcoin, Ethereum, etc.), CHATgtp is here to write articles on any topic, Radio frequency identification (RFID) are here to replace front door security checks. etc.

The outbreak of COVID19 left most organizations with no option than to embrace emerging technology. Humans are now submitting their roles to technology. Literature suggests that university libraries like any other organization are adopting new technology to stay relevant in this epoch (Cao, Liang and Li 2018; Gul and Bano 2019). Some libraries are now implementing the 4IR technology such as AI in form of virtual reference chatbots (Arora *et al.*, 2020), face recognition tools for security and surveillance activities (Ali *et al.*, 2020). AEG and AI2 bot identify software bugs and cyber-attacks (Prasad and Rohokale, 2020). RFID technologies enhances modern library software to control the library collections from theft and loss and Alexa and Siri skills for frequently ask question FAQ (Hussain and Shahid, 2022)

Despite the several benefits that come with accepting the 4ir, there is a global concern on how this will affect the relevance of human work force, loss of jobs and redundancy. In a 1994 editorial by David Raitt's, he raised a question around his concern about the developments with the Internet, "will librarians still be around in 2024, and if so, what will they be doing?". Oxford University forecasts a possible 35 per cent job loss in the UK due to automation in the next 20 years (Frey and Osborne, 2013). Several research in library field foresee a job lose tsunami and unemployment in the fourth industrial revolution era. (Hussain, 2020; Ayinde & Kirkwood, 2020; Chaka &Chaka, 2020). Deloitte alludes that there will not only be labor displacement, but a shift toward new skills (Deloitte Global & the Global Business Coalition for Education, 2018) Nwaohiri &. Nwosu (2021) and Hussain (2023) predicts that inadequate skills with technology will be an impediment for librarians in the 4ir. It therefore becomes imperative to investigate the skills level of university library staff in readiness of the 4IR. This study is herewith guided by the following research questions:

1. What are the digital skills currently possessed by Nigerian university library staff in the 4IR?
2. What are the existing digital skills training programme for Nigerian university library staff in the 4IR?
3. What are the challenges of training and skill for Nigerian university library staff in the 4IR?

Methodology
This research used a literature review approach to appraise published literature in line with the research questions. The University of Strathclyde Library's discovery layer, "SUPrimo" was used to find sources published between 2015-2023. Google Scholar was also used to find relevant sources published on the 4IR. See Table 1 below for a breakdown of the procedure.

Table 1. Breakdown of searches and selection of resources.

Boolean keywords	Search engines and number of resources	Inclusion criteria	Number of resources after inclusion criteria
		Themes:	
	SUPrimo	University library	
(4IR OR "Industry 4.0" OR "the fourth industrial revolution") AND ("higher education library*" OR "university library*")	EBSCO: 453	Digital Skill	**SUPrimo:** 21
	ProQuest: 118	Training	
	Scopus: 229	Nigeria	
	Web of Science: 59	**Language:** English	**Google Scholar:**17
	Emerald: 7		
	Google Scholar: 393	**Full text**	
Totals	**1259**		**38**

Methodology Procedure and analysis

Table1 above shows the search and selection procedure of resources. The first stage was to design boolean keywords derived from the topic of the research as the search string and this gave a total of 1259 resources. A set of inclusion criteria was applied on titles and abstracts of the located resources; The resource must be a full text, must be in English language and must carry the set themes of the research. 38 resources considered relevant for this study were downloaded and saved in an electronic Microsoft folder. These relevant resources were reviewed in line with the objectives of this study.

Literature Review

The review gave insight into a general background of the 4IR, the current level of digital skills, the digital training pathways available to university library staff in Nigeria and the challenges of training programs for university library staff in Nigeria.

History Reflection on the 4ir.

Human society has evolved in phases over the years. There have been discussions by creationist around the creation of human with the belief that man evolved from being Homo sapiens, in some other quarters, there have been debates about the stand of the bible about creation and how the first set of humans emerged, the creation of Adam and Eve in Genesis and further arguments around the Charles Darwin theory of evolution. Human activities at that time were mainly gathering, agrarian and hunting (Ruse, 2022). It was postulated by Charles Darwin in a seminar work that human activities will transform from primitive practice to industrial society. (Darwin, 1859) and this gave birth to the first and second industrial revolution.

The first industrial revolution was a period from the late-18th to mid-19th century, with the invention of steam and water to create new machines. This era brought rapid innovation in the areas of agriculture and manufacturing which brought transformation to the economy, created a market for innovation and profit making. This era formed a class of laborers. history has shown that this era was not pleasant for the average laborer. The ideology around this era gave emergence to the Communist Manifesto and the whole concept of the social sciences. This invention, first-time revolutionize mechanization of production and allow a drive towards a social change for human to became more urbanized. The second industrial revolution also known as the technological Revolution occurred from the late-19th to early-20th century, an ear that propels the use of electricity and gave rise to mass production, The focus of this era was the power of electricity and the engines which gave emergence of light bulbs, automobiles, airplanes, telegraphs, weapons etc. This era fueled a lot of economic unrest that led to wars (Schwab, 2015)

The third industrial revolution also tagged the third wave was the era of digital Revolution which began in the 1950s, a third industrial revolution ushered the development of computers, electronics, and digital know-how to mechanize production. In the 1990s, the advent of internet brought a serious explosion to the third wave, expanding the scope from digital innovation to information explosion. This introduced the use of world wide web(www) and later micro blogging websites also know as social media. This information revolution resonates better within the library and information science profession. It is the reason why the profession has "information science" part in the name. It ushered positive developments for libraries. The services of the libraries were up-scaled to automated operations and services, digital catalogs, electronic databases, integrated library systems and other developments the increase the ease and efficiency of the library operations.

The concept of the Fourth Industrial Revolution era (4IR) was devised by founder and executive chairman of the World Economic Forum, Klaus Schwab in 2017 noting that the 4IR follows in the footsteps of the third wave and builds on the fundamentals established by previous industrial revolutions but is distinct pattern (Schwab, 2016). Schwab sees the 4IR as a revolution characterized by a fusion of technology that dissolves the physical, digital, and biological divides, blurring the lines between the physical space, technology, and human.The previous evolution phases substituted the physical human activities while 4IR substitutes human intelligence and cognitive. Also, In the previous revolution, technology took the roles and jobs of human but over time they learned more skills and adopted Ayinde and Kirkwood 143 advantage

of the higher cognitive tasks which the machine could not do(Ayinde & Kirkwood, 2020). The 4IR technologies are designed with the ability to think, sense, move, learn, code, decode and acting independently with little or no interference of a human. This brings about the argument that 4IR will send human beings into redundancy. Russell (2016) projects into the future and thinks AI would become the ideal personal assistant performing better than humans and be available to all. It is believed that The 4IR will make lives better, easier and more productive but jobs and livelihoods will become collateral damage.

The innovative technological developments brought by the 4IR are the Internet of things (IoT), artificial intelligence, robotics, nanotechnology, 3D printing, automation, machine learning virtual reality, quantum computing and other technologies with diverse applications. 4IR is the growing technological wave that changes how modern people live and work. It describes the information technology evolution towards greater automation and interconnections (Lund, 2021). The 4IR is largely divided into three categories which are physical, digital and biological. Physical: intelligent robots, autonomous drones, machine learning, 3d printing, smart sensors. Digital: internet of things, services, data. Biological: Synthetic biology, individual genetic make-up.

Some of the emerging reality within the 4IR is the apocalyptic future of the unrealistic activities in video games online suddenly become the reality for the physical world, for example, the Elon mosk's driver-less cars replacing the trucking industry. The invention of automated bank tellers and mobile banking. ATMs and online banking provide many of the common banking services previously available only with the assistance of a person. Virtual reality in sport especially the use of VAR in football has brought a lot of precision and accurate judgment. Radio frequency identification (RFID) technologies, which is an application of the Internet of things which is largely used for security in stores, malls, banks, and libraries through sensor.

Also, Alexa and Siri skills which fulfill various demands and activities of users through voice commands (Hussain and Shahid, 2022). Surveillance applications have made it possible to develop face recognition tools and thumb recognition that may be used for security purposes and surveillance activities (Ali *et al.*, 2020). With cyber-attacks, AEG bot and AI2 are security tools for safeguarding data and applications, these tools can positively determine software bugs and cyber-attacks (Prasad and Rohokale, 2020).

Libraries in the 4ir
The third industrial revolution, also known as digital revolution gave recognition to the library and information science profession, It is why we have that "information science" part in the name. It heralds digital computers and computer networks. Libraries gained digital catalogs, electronic databases, integrated library systems, the Internet, Microsoft Office, and all developments that increased the ease and efficiency of library operation and services.

The 4IR has introduced some innovative technology to the libraries. The library scene now use technology like the Internet of things (IoT), artificial intelligence, robotics, automation, blockchain etc. Liau (2019) asserts that many libraries in Singapore make use of robots for sorting of returned books, shelf reading and transportation of library materials. The University of Pretoria Library introduced a popular robot, by the name "Libby", which is now a new library employee. Libby is the first humanoid librarian in Africa ocholla & ocholla 2020. Some libraries use AI for virtual reference services, they have chatbots that use machine learning, through these services, a librarian can answer its patron regarding library queries (Arora *et al.*, 2020). Alexa and Siri have been introduced by many libraries to respond to frequently ask question(FAQ).The University of South California fulfill various demands of users like FAQ, events updates and the library catalog search (Hussain and Shahid, 2022).

Radio frequency identification (RFID) technologies are some of the best examples of IoT. RFID uses sensor on Security doors and walk-through gates that are connected with modern library software, which controls the library collections from theft and loss. Also on security, Liu (2019), proposed a smart library management system that runs on block-chain technology. The system eliminates the possibility of data tampering , solves the problem of low efficiency, poor security of the central system by distributed

accounting, the danger of damage to the central database and guaranteed data security. Block-chain technology has also been used in the libraries for Digital preservation, inter library loan and voucher systems; library verification and credentialing of patrons, large storage of archival /special collections where provenance and authenticity are essential, library record keeping and data management of intellectual property. Libraries purchase items from all over the world in a variety of currencies, and currency fluctuations can have a significant impact on library budgets. Financial applications of block-chain-based currencies (such as bitcoin) for financial transactions between libraries and publishers, potentially eliminating exchange rate issues while streamlining acquisition processes (essentially a supply chain). Tella,Amuda & Ajani (2022).

These 4th Industrial technologies have enhanced library services such as Open Educational Resources (OER), Institutional Repository (IR), Integrated Library Systems (ILS), Website, Blog, Social Media, Databases and the operation of other emerging technologies in Nigerian university libraries. The 4IR phase in the Nigerian library environment is at the awareness level , the majority of the information practitioner simply have a basic understanding of its implications. Emerging researches from Nigeria on the 4IR indicate that Nigerian information professionals now lack the fundamental 4IR abilities needed for the job market and a wide range of broader 4IR-related skills. The results also show that Nigerian information professionals desired some 4IR abilities that are necessary to succeed in the future job market, including leadership, creativity, technology, people management, service orientation, entrepreneurship, and technical skills. (Ayinde & Kirkwood,2020; Nwaohiri and Nwosu, 2021,Owolabi 2022; Tella, et.al, 2022 ; Ajani et.al, 2022)

The proposal of Ocholla et al., (2016), in response to the rapidly changing environment of university library in the 4IR, demands that library services be accessible anytime, and anywhere and revolutionize the speed of technology and impact of new systems to change this era. The figure below illustrates what a university library 4.0 should be but for the sake of this study, focus will be on SMART STAFF.

Source: Ocholla & Ocholla (2020)

Skills Requirement for the 4ir Environment
 the fourth industrial revolution is currently changing the responsibilities and roles of librarians worldwide. This situation has called for a fundamental rethink to reequip librarians with the necessary competencies to ensure effective and efficient delivery of services to clients whose needs are dynamic. Devi, Vikas and Devi (2006) defined skill as the application of the knowledge gained or development with the ability to use them to satisfy the users' information need. Previous research has clamored for the skills requirement in the third industrial revolution which can serve has basis and foundation for the the fourth industrial revolution. Some scholars have argued that library staff in digital environment need to have an hybrid of generic skills, core traditional librarianship skills, information technology skills and management skills (Gulati and Raina, 2006; Singh and Pink,2009; Carl, 2010; Arif and Mahmood, 2010)

Buarki et al., (2011) have listed the professional digital skills needed by library staff, ranging from basic computer skills, knowledge of technologies, library automation software usage, online database searching, online cataloguing experience, information retrieval, word processing, desktop publishing and webpage

design and maintenance. Inyang and mngutayo (2018) identified the some digital and software applications, skills and competencies needed to be, basic knowledge of computers, ERMS (Electronic Resources Management System), library website content management, Integrated Library System (ILS), digital repository system, social media usage and understanding the mobile devices and related technology that are applicable to a library. Bughin et al. (2018) in a McKinsey report categorized workplace skills in the 4th IR into five groups: physical and manual skills, basic cognitive skills, higher cognitive skills, social and emotional skills, and technological skills. Also, Koya and Gopakumar (2018) elaborates on IT skills which information professionals should possess including hardware skills, software skills, content management and development software skills, programming skills, reference management skills, and software security.

Baro, Obaro and Aduba (2019) investigated the digital skills of librarians working in various universities libraries in English-speaking countries in Africa and found that their basic digital skills i.e., documents uploading, social media usage, e-mail services, etc. is remarkably high. While ability to use open-source software, digital library development skills, skills in applying modern technologies, metadata development skills, and library website development skills were rated to be moderate and low. Okeji, Tralagba and Obi (2021) investigated the available digital skills of librarians in university libraries in Nigeria and rated their knowledge of network and system security; ability to apply security software firewalls, filtering routers and ability to protect access to digital content and these were found to be poor. Friday and Onuh (2022) revealed in their study of 21st century librarianship skills in public universities in Nigeria. the basic digital skill of emailing, word processing, internet surfing and social networking skills were prevalent among the librarians while the advances digital skills to navigate in a digital environment was extremely low. Tella et al. (2022) report that skills mismatch with the recent trends in the information professions is one of the greatest threats facing Nigerian information professionals, most especially in the 4IR era, and if care is not taken, it could negatively affect the future of information professionals

Ajani etal (2022) asserts that 78% Nigerian information professionals were not sure if they had the 4IR skills to secure a position in the global job market. This means that the vast majority of Nigerian information professionals lack the necessary 4IR skills and might find it difficult to get job in the 4IR era. There is a beam of hope as Nigerian information professionals have shown desire and willingness to acquire some 4IR abilities that will make them relevant in the epoch of the 4IR (Ajani ET.AL 2022)

Training Readiness for the Emerging Digital Environment
The shortage of skill and skilled workforce have posed a lot of challenges on the operations of the libraries in this digital era. libraries were grasping to develop skills and catch-up with the technology of the third wave, The 4IR heralds a storm of new technology. The evolving nature of the unfamiliar environment requires that library staff possess additional knowledge and new skills to work within the digital information world. Choi (2006) emphasized that educating and re-skilling the library workforce in this dynamic and complex digital environment must become a high priority. Updating of skills and competencies could be achieved through teaching/learning, training, and skill acquisition. Skill updating is an aspect of professional development and human resource development which could be in the form of education and training. Education takes place in formal learning environment and lays the foundation on which the training on the job takes place. The focus of formal education is to give pre- service training while job roles and Specific task training is the sole responsibility of the employer. The in-service training acquired when one starts working in an organization and it continues throughout the work life. On-the-job training takes the form of demonstration, lecture, discussion, programmed instruction, mentoring, literature research, job exchange, regular staff meeting, project and task management and technology assisted training while off–the–job training takes place outside the normal working environment in form of, further education and career development, interest group, professional contribution, conferences/ seminars, short courses, and workshops.

Chiware (2007) also alluded that training for library staff or information professionals could be approached in two broad ways; Library school LIS courses and continuing education programmes She noted that digital library education should be incorporated into LIS course contents for the sound theoretical knowledge.

Also, continuing education programmes (workshops, short courses, and conferences), visit to other libraries and on-site visits by experts should be encouraged. She further affirmed that there is lack of competent trainers for digital environment even in the LIS education sphere as the library school educators need to upgrade their knowledge and skills. Their prior training and the curricular that produced them, pre-dates this new digital environment. Some measures to help enhance the training of librarians for the digital environment according to Ocholla and Bothma (2013) are re-orientation, curriculum review and revision of LIS education for increased use of emerging technology. These authors believe these are a veritable means of updating the skills of librarians in the digital environment.

Inyang, and Mngutayo (2018) alludes to how to acquire required skills and competences of the digital revolution technology. They regard formal training as one way that required skills are taught. This could be short duration courses, library workshops and seminars organized by software manufacturers or special libraries. Also, competency could be acquired through training by suppliers. The vendors who have supplied software are responsible for its installation in the library and train the personnel of the library in the usage and maintenance. Furthermore, skills could be updated through formal education in library schools. This can be achieved through courses included in the curriculum of library schools and taught to undergraduates or postgraduate levels. The authors, however, debunked the general notion that being computer literate does not translate to possessing the required digital skills required to carried out library activities. Atanda (2018) asserts that for an effectively and sustainable digital projects to be successful, skilled workforce are essential for the implementation. There is a need to build on the framework of a well-trained information technology workforce. What obtains in libraries is that tech contractors employ trainers to visit and give superficial training for few days at great cost and leave without some back-up capacity on the ground. This has caused a major setback in information systems and technology development projects in developing countries and plaguing their operation more with lack of trained workforce.

Obuh (2019) Investigated the proficiency of librarians as managers of library systems in academic libraries in Nigeria with special focus on the form of training on ICT skills. the finding revealed that most librarians in Nigeria acquired their skills through self-studies, colleagues' influence and on-the-job. Oyovwe-Tinuoye, Omeluzor and Patrick. (2021) up-holds this assertion that most staff of the university library acquire ICT skills through self-sponsorship. Friday and Onuh (2022) attests to the popular method of acquiring skills by librarians in university libraries in Nigeria to be; colleagues' assistance and training at workplace. Echem (2022) gave insight to the capacity development programs in university libraries in Nigeria, his correlation result revealed that, there were weak but positive relationships between on-the-job, in-service, off-the-job, mentoring and capacity development of librarians. This shows that there is scarcity of training for library staff in Nigeria. furthermore, Osesi et.al, (2022) conducted an assessment of the professional development and training of library staff at a federal university in Nigeria, they found that the available professional development programs for the library staff are Orientation, On-the-job training, In-house Training, Seminars and Instructor-led-Training. However, Distance Educational Programs, Conferences/Workshops, Study visits, formal professional library education, and TETFUND Programs are unavailable to the library staff. In a study by Ikolo and Nongo (2022) on the need for continuing professional development to update the skills of librarians, the respondents indicated that they prefer participating in seminar/workshop and face-to-face courses. Very few of the respondents have attended any specialist digital skill training. The librarianship degree acquired from library schools only creates a background and foundation for librarians. Skills development and competence up-scaling can help librarians put theoretical knowledge into practice and apply general conceptualization to role specific responsibilities such as the ability to function in a digital environment. The library profession has become conscious of the need for skill development and continuous training, because of the increasing variety of emerging technology brought by the 4IR. Academic libraries, by the nature of its operation of providing information and retrieval services, are intimately tied to the constant technological changes of this information epoch; therefore, the role of training and retraining of staff to meet this challenge is inestimable and unavoidable.

*Challenges of training and skill for Nigerian university library staff

Adetunla, et.al (2023) Stated that the advanced digital skills to navigate in the 4IR was extremely low and the major factor responsible for this low level of advanced skills was lack of training. They further looked into the challenges of training in public universities in Nigeria and found; poor funding of libraries which further cascades into lack of fund for staff development programs, negative managerial attitude towards staff development, non-availability to digital courses in library schools' curriculum and poor ICT infrastructure. In another study by Ikolo and Nongo (2022), The foremost challenge of training identified was excessive cost of training and this has caused a wide skills gap and low performance output in most libraries in Nigeria. They suggested that librarians should be armored with the required on-the-job training and affordable courses. Ajani et.al (2022) explains the difficulties involved in training future information professionals for the 4IR include lack of funding for the training school, lack of skilled staff, a poor attitude on the part of the staff to learn or seek a new set of skills, lack of staff to teach new skills, as well as the antiquated and subpar nature of the training system. As a result of these challenges, the study, therefore, concludes that poor preparation of future information professionals in Nigeria could result in job losses, economic disparities, unemployment, and workplace under performance in the 4IR.

Finding.

The status of adoption of the innovation of the 4IR in university libraries in Nigeria is low compared to their counterparts in the developed countries and South Africa where there is use of robotics and AI for the library operations. The technology of the Third wave which found it's extension into the 4IR such as automation and IoT are the only evidence of the 4IR in university libraries in Nigeria. The development of literature on the 4IR in university libraries in Nigeria has shown that the libraries are at the level of preparedness in terms of awareness and skills assessment.

Current Digital Skills Level of Nigerian University Library Staff in the 4IR

The review of literature has revealed that there is low level of digital skills and competence to function in this era. Library staff in Nigeria were found to have the basic digital skills for their day-to-day operations, such skills as; use of Microsoft word, connection to WiFi and networks, use of email to send and accept documents etc Also, they possess other soft skills such as managerial and core traditional librarianship skill but lack the advanced digital skill like knowledge of technologies, library automation software usage, library website content management, Integrated Library System (ILS), digital repository system, expert Chat-box system etc. The findings have shown that Nigerian university library staff do have the requisite skill to function in this fourth industrial era and this is corroborated by the assertion of Tella et al. (2022) and Ajani et.al (2022) that the current skills mismatch is one of the greatest threats facing Nigerian information professionals in the 4IR era, and this could negatively affect the future of information profession.

Existing Digital Skills Training Programme for Nigerian University Library Staff in the 4IR.

Findings revealed that, the training found available to university staff are meant to enhance their basic digital skill. and no available training or sign of preparation for the advanced digital skills required in the fourth industrial revolution epoch. Notable types of training programs available to the university staff are On-the-job training, In-house Training, Seminars and Instructor-led-training on the existing basic technology tools. However, Distance educational programs, Conferences/Workshops, Study visits, formal professional digital library education, and TETFUND Programs are largely unavailable to the library staff for training on the 4IR. By implication,it means there is poor level of preparedness as there no focused training to upscale the skills level of the Nigerian university library staff in the 4IR. This outcome conforms with Osesi et.al, (2022) and Ikolo and Nongo (2022) that the library staff in Nigerian universities lack professional development programs for the 4IR.

The Challenges of Training and Skill for Nigerian University Library Staff in the 4IR

Some of the challenges found to have contributed to the low skills level and inadequate digital training program were poor funding of libraries which further cascades into poor staff development programs and poor ICT infrastructure. Also, obsolete library schools' curriculum which has led to non-availability of

digital courses on the emerging technology. Another foremost challenge of training identified was lack of skilled manpower within the system to teach new skills. These findings are in consistence with the report of Adetunla, et.al (2023).

Conclusion and Recommendations

4IR is the growing technological wave that changes how modern people live and work. The effect of the innovative technology has been felt across every aspect of human endeavour and by extension the field of library and information services and specifically the university libraries. University libraries across the globe now make use of AI, robots, IoT, automation etc. Despite the several benefits that come with accepting the 4ir, there is a global concern on how this will affect the relevance of human work force, loss of jobs and redundancy.

One of the quotes of Schiller as cited by Marwala, (2019) comes to mind, that "you cannot wait until a house burns down by fire before you put insurance on it." The 4IR is here upon us with disruptive technology that has come with numerous benefits and threats. University library management cannot wait until there are massive dislocations in our libraries to prepare for the 4IR. The time to prepare our libraries for the 4IR is now. Based on these concerns, the following recommendations are made:

• information professionals should develop a positive behaviour to accommodate the new era., by upskilling and re-skilling to remain relevant in the 4IR era.

• University library management should improve on staff training and continuing professional development to improve the readiness and preparedness of the library for the modern technological trend this era has brought upon us.

• The Nigerian library schools' should revise the curriculum to accommodate the awareness about the emergence of the 4IR era and core 4IR skills.

• In Nigerian library schools where there is skill and competency deficits, universities should encourage inter-faculty collaborations. Library schools situated in the Humanities and Social sciences faculties should form alliance with faculties like Sciences and Engineering.

• Nigerian universities can support this process by offering flexible multi-disciplinary programs that respond to these real-world needs to enable library staff acquire the skills needed for the jobs of the future. This is already evident in some universities and library schools:

Block-chains for the Information Profession at San Jose State University iSchool,
Artificial Intelligence; a program of Stanford University Libraries and
 the Good Systems Program at the University of Texas ischool

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