EQUIPPING LIBRARY AND INFORMATION SCIENCE PROFESSIONALS AS AGENTS OF CHANGE THROUGH THE USE OF TELECOMMUNICATION GADGETS IN THE FIFTH INDUSTRIAL REVOLUTION

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Abstract

This study explores the crucial role of libraries and information science professionals as agents of change in the Fifth Industrial Revolution, emphasizing the integration of telecommunication technologies to enhance library services. The research seeks to determine how the adoption of telecommunication gadgets can empower information professionals to drive community transformation and to identify the major challenges faced in this process. Employing a survey research design and quantitative methods, the study highlights existing competency gaps among library professionals and identifies key barriers such as inadequate funding, limited training opportunities, and resistance to technological change. Findings indicate that while telecommunication gadgets possess immense potential to transform library operations and strengthen community engagement, their successful utilization depends on strategic investment in professional development and digital literacy programs. The study emphasizes that empowering both library staff and users with technological and soft skills is essential for promoting innovation, inclusivity, and knowledge sharing. Furthermore, continuous learning, institutional support, and collaborative efforts among stakeholders are critical for overcoming challenges and sustaining progress. The study concludes that equipping library and information science professionals with the necessary tools and competencies not only enhances their effectiveness as change agents but also ensures the relevance of libraries in a rapidly evolving digital landscape. Ultimately, the research offers practical recommendations for leveraging technology to foster sustainable development, strengthen community ties, and position libraries as key drivers of social transformation in the era of the Fifth Industrial Revolution.

Keywords: Libraries, Information Science Professionals, Telecommunication Gadgets, Digital Literacy, Change Agents

Introduction

The Dawn of the Fifth Industrial Revolution (5IR) marks a paradigm shift in the global landscape, characterized by the synergistic integration of advanced technologies and human-centric innovation. Unlike its predecessor, which focused heavily on automation and artificial intelligence (AI), the Fifth Industrial Revolution emphasizes collaboration between humans and machines to foster inclusivity, sustainability, and ethical advancement. In this evolving landscape, the role of Library and Information Science Professionals (LISPs) is undergoing a significant transformation from custodians of information to proactive agents of change.

The Fifth Industrial Revolution (5IR) emphasizes human-centered collaboration with cutting-edge technology, such as automation, IoT, 5G, and artificial intelligence, which creates new responsibilities and expectations for public institutions (IFLA, 2024; Gbaje, 2025). Telecommunication devices, such as smartphones, tablets, laptops, Internet of Things devices, and associated connectivity tools, are not just accessories in this context; rather, they are catalysts that facilitate real-time interaction, remote access, and scalable library service delivery. Particularly in underserved and distant locations, these devices facilitate user-driven services that address local requirements and expand the channels for information distribution (Azubuike, 2023; Okwu, Okwu, & Oladokun, 2024).

The changeable availability and exposure of library services is closely associated with communications devices. By lowering geographical and temporal barriers to collections and activities, telecommunication tools can increase participation and inclusivity (IFLA, 2024). Better access does not, however, always translate into increased digital visibility; visibility depends on complementing strategies that many libraries are still working on, such as digital marketing, online service design, and infrastructure reliability (Azubuike, 2023; Girish, 2025).

The competency profile of information science professionals' technical capabilities (networking, metadata, digital preservation), digital literacy pedagogy, and soft skills (communication, community involvement, change management) is a key human variable. According to the research, in order for librarians to be effective change agents in a 5IR context, they must have both people-centered and technological capabilities (Nwobu et al., 2024; Gbaje, 2025). Therefore, relationships with educational and technology providers, ongoing professional development, and mentorship are important moderating elements that decide whether telecommunication devices result in significant community transformation.

The aforementioned elements influence the outcome variable of librarians' function as change agents. Librarians become facilitators of innovation, local development, and lifelong learning when telecommunication tools are combined with staff capability, stakeholder participation, and contextually relevant programming (Okwu et al., 2024; IFLA, 2024). Mobile outreach, virtual reference, e-learning, and community co-creation labs are examples of programs made possible by telecommunications devices that show how librarians actively influence social and economic consequences.

Research Questions

1. How can the integration of telecommunication gadgets in Library services enhance the role of information science professionals as agents of change in their communities during the Fifth Industrial Revolution?

2. What are the Challenges faced by Equipping Libraries and Information Science Professionals as Agents of Change in the 5th Industrial Revolution?

Literature Review

The role of libraries in the digital age has evolved significantly, with telecommunication gadgets emerging as pivotal tools for enhancing information access and community engagement. According to McClure and Jaeger (2019), libraries worldwide are increasingly adopting mobile technologies to bridge the digital divide, enabling access to information for underserved populations. This shift not only facilitates information dissemination but also empowers library professionals to serve as community advocates and change agents. The integration of telecommunication technologies fosters collaboration and innovation, aligning with the principles of the Fifth Industrial Revolution, which emphasizes human-centric approaches and sustainability (Schwab, 2020).

In the African context, the adoption of telecommunication gadgets in libraries is crucial for addressing challenges such as limited access to information and educational resources. African libraries are leveraging mobile technologies to enhance service delivery and reach remote communities. This approach is essential for promoting digital literacy and fostering socio-economic development. Furthermore, library professionals are increasingly recognized as key players in advocating for policy changes that support technological integration in libraries, aligning with the goals of the Fifth Industrial Revolution (Horsfall, 2023).

In Nigeria, the integration of telecommunication gadgets in libraries has gained momentum as a strategy for improving access to information and fostering community development. Nandi, et al, (2025) emphasizes that Nigerian librarians are increasingly utilizing mobile applications and social media to engage with users and promote library services. This trend not only enhances information dissemination but also positions librarians as facilitators of change. Additionally, training programmes focused on digital skills are essential for equipping library professionals with the necessary competencies to navigate the challenges of the Fifth Industrial Revolution (Nwobu et al, 2024).

The literature highlights the transformative potential of telecommunication gadgets in equipping library and information science professionals as agents of change across various contexts. Globally, these technologies are reshaping the role of libraries, while in Africa and Nigeria, they are critical for addressing local challenges and promoting socio-economic development. Continued investment in training and technological infrastructure is essential to maximize the impact of these tools in the evolving landscape of the Fifth Industrial Revolution.

Types of Telecommunication Gadgets used in the 5th IR

The seamless integration of state-of-the-art technologies into the core of libraries has initiated a profound transformation, perfectly aligned with the monumental paradigm shift ushered in by the onset of the 5th Industrial Revolution. This technological metamorphosis goes beyond traditional boundaries, granting libraries a dynamic and multifaceted ability to

interact with patrons through innovative and unexplored avenues. The telecommunication gadgets include:

1. **Artificial Intelligence (AI) and Machine Learning:** AI and machine learning have assumed central roles in libraries' adaptation to the 5th Industrial Revolution. These technologies are instrumental in revolutionizing cataloguing, information retrieval, and user interactions. Machine learning, on the other hand, enables libraries to analyze vast datasets to glean insights, optimize resource allocation, and deliver services aligned with evolving user.
2. **Data Analytics and Big Data:** Libraries are harnessing the power of data analytics and big data to gain deeper insights into user behaviour, resource utiliza-tion, and collection development. Big data analytics enables data-informed deci-sion-making, enhancing operational efficiency and resource allocation.
3. **Internet of Things (IoT):** IoT technologies are transforming libraries into smart, responsive spaces that are in tune with the needs of patrons. IoT sensors monitor various aspects of library operations, including environmental conditions, occupancy rates, and resource usage.
4. **Blockchain:** Libraries are exploring blockchain technology to bolster the security and transparency of transactions, particularly in the management of dig-ital assets and intellectual property.
5. **Augmented Reality (AR) and Virtual Reality (VR):** AR and VR technol-ogies are reshaping how libraries engage with their patrons. These immersive technologies enable virtual library tours, interactive learning experiences, and in-novative storytelling.
6. **Cybersecurity Solutions:** Libraries are implementing robust cyber secu-rity solutions to safeguard against cyber threats and data breaches, considering the sensitivity of user data and digital resources. Intrusion detection systems and encryption protocols are vital in protecting library assets and ensuring patron pri-vacy.
7. **Cloud Computing:** Has revolutionized how libraries manage and deliver digital services. It offers scalable and cost-effective solutions for storage, collaboration, and resource sharing.
8. **5G and Enhanced Connectivity:** The widespread deployment of 5G net-works promises to revolutionize library services. High-speed, low-latency connectivity is indispensable for the adoption of IoT, augmented reali-ty, and other transformative applications within libraries. 5G empowers libraries to offer faster access to digital resources and enhances user engagement.
9. **Accessibility Technologies:** Libraries are proactively embracing accessibility technologies to ensure inclusivity and accessibility for all patrons, including those with disabilities. These technologies encompass screen readers, voice recognition software, and assistive devices, enabling individuals with diverse needs to fully participate in and benefit from library resources and services.
10. With these technologies, libraries are poised to continue serving as vital pillars of education, research, and community engagement, adapting to the evolving needs of their patrons and remaining at the forefront of knowledge systems (Yusuf & Bolaji, 2024).

The Future of Library Services

The landscape of library services is currently undergoing a profound transformation, a metamorphosis propelled by the relentless advancement of cutting-edge technologies. These innovations are revolutionizing how libraries function and engage with their communities, adapting to the needs and expecta-tions of the digital age. A noteworthy stride in technology-driven library services is the incorporation of artificial intelligence (AI) and machine learning.

AI-driven virtual assistants and chatbots offer immediate assistance, thereby enriching the overall user experience. Machine learning algorithms optimize resource organization and discovery, ensuring swift and efficient access to information These technologies not only streamline library operations but also customize the library experience for each individual. Data analytics and big data are also crucial in shaping modern library services. Libraries can now analyze user behaviour, resource utilization, and collection trends, enabling data-informed decisions about resource allocation and responsiveness to patrons' evolving needs. (Kociubuk et al., 2023)

The Concept of Information Professional, Change Agent and Society

The concepts for this study are information professionals, change agents, and society. All are explained in detail for better comprehension of the direction of the paper.

Information Professional: According to Horsfall (2023) information professionals are individuals who use information strategically in their work to help their organizations meet vital goals. Information professionals accomplish this through various means including gathering, developing, deploying, and managing information resources and services. Information professionals harness a variety of existing and emerging information tools to accomplish goals.

Change Agent: Change means to make a shift, to alter, remodel, revamp. A change agent is that individual, person, or group that undertakes the task of initiating and managing change in any organization, region, or state. These change agents can help to transform the socio-economic development of the country, inspiring and influencing others and so on (Horsfall, 2023).

Society: A society is a group of people who have regular interactions with one another, or a large social group that shares the same spatial or social territory and is typically subject to the same political authority and dominant cultural expectations (Artur, 2019).

Competency of Library Information Science Professionals

In the context of the 5th Industrial Revolution (5IR), professional competencies for information professionals are evolving to meet the demands of a rapidly changing technological landscape. The integration of advanced technologies such as artificial intelligence, machine learning, and big data analytics necessitates a diverse skill set that encompasses both technical and soft skills. Key Professional Competencies include:

1. **Technical Skills**: These are specialized abilities and knowledge used to perform specific task, often involving the use of tools, software or equipment.
2. **Soft Skills:** The ability to convey complex information clearly and concisely is vital. This includes both verbal and written communication skills, as well as active listening to understand user needs**.**

3. **Adaptability and Continuous Learning:** Information professionals must be open to learning new skills and adapting to changing technologies. This includes engaging in continuous professional development through courses, webinars, and networking opportunities**.**
4. **Leadership and Customer Service Orientation:** Leadership skills are necessary for guiding teams and mentoring others, while a strong customer service orientation ensures that user needs are prioritized and met effectively**. (**Oladokun, et al 2024).

Roles of Information Profession as Change Agents

As change agents in society, information professionals perform different roles in to bring change in society in the area of librarianship and information sciences. Some of the roles of information professionals that bring changes are:

1. **The Information Professional as Researcher:** It has become necessary for the Information Professional to be involved in research and development by facilitating access to information, such as finding, delivering, and summarizing information.
2. **The Information Professional as Organizer and Publisher:** The Information Professional has to play important roles such as organizers, reviewers, and guardians of intellectual property in the development of the future (Borrego, & Pinfield, 2020). As the world is becoming a global village information professionals as information gatekeepers are at the forefront to make that a reality in society by embracing and incorporating the changes in librarianship.
3. **The Information Professional as Teacher and Consultant**: The Information Professional must guide users in information gathering, information skills, and tools, organizing information resources, research strategies, basic reference works, accessing information, and many more. Technology is far ahead of information literacy education, however, information professionals are trying to bridge the gap via information literacy education (Rosi, 2016).
4. **Information Professional as Navigation, Browsing, and Filtering Expert:** The Information Professional is an expert in navigation, browsing, and filtering, digital reference services, and electronic information services from digital information sources (Engerer, 2020).
5. **The Global Digital Library:** The Information Professional is fully responsible for the digital library operations. The digital library is really a transitory phase towards the universal digital library, a vast distributed information and active repository accessible from anywhere with increasingly improved indexing, extraction, and summarization techniques (Ilahi, et al, 2019).
6. **Information Professional as Knowledge and Data Mining expert:** Data mining provides the ability to mine data and text through knowledge discovery. The library as an information centers has consistently adopted data mining. The information professionals have the knowledge of data mining and discovery of knowledge from digital libraries to extract unmet information needs for users. **Information Professional as Search and Retrieval Co-Ordination:** The Information Professional can achieve the goal of creating information queries by using retrieval engines and indexing structures (Ajibade, & Muchaonyerwa, 2023).

Methodology

The design and procedure used for the study are discussed in the following heading

The study adopted a survey research design through the use of a qualitative research method. Surveys are effective for gathering information directly from your sample population. It's a common research plan that researchers across different industries, such as marketing, manufacturing, and technology employ. Questionnaires were under survey and were used for the study to extract data from the respondents. (Indeed, 2024)

This study is limited to the Adamawa State academic institution's library staff and members of host communities. The population of the study includes the staff and some members of the library's host community. The researchers adopted the stratified random sampling technique to select 30 Librarians and 100 community members from the host community' giving a total of 130 respondents which is made up of two strata; 65 males and 65 females.

Data was analyzed by using frequency and simple percentages. Results were also presented in tables. The percentage of respondents was used for simplifying and reducing the presentation of the raw data. These include the calculations of percentages and tables that were necessary. A percentage of 99.9% - 50% was accepted as Very High (VH) and High (H) by respondents while 49.9% - 16.6% accepted it as Low (L) or Very Low (VL) by the respondent. If the percentage of response rate from the research question table was 50% and above was considered accepted while a percentage response rate below 50% was considered rejected. The presentation, analysis, and interpretation of data are presented below. Tables were used to present the results of this study according to the research questions.

Research Question 1: How can the integration of telecommunication gadgets in Library services enhance the role of information science professionals as agents of change in their communities during the Fifth Industrial Revolution?

Table 1: Percentage responses of areas on how can the integration of telecommunication gadgets in Library services enhance the role of information science professionals as agents of change

S/N	ITEM STATEMENT	S A	A	S D	D	TOTAL
1.	Telecommunication gadgets improve access to library service for underserved communities.	70 53.84%	40 30.76%	15 11.53%	5 3.84%	**130** **100%**
2.	Information professionals use telecommunication tools to engage more effectively with community members.	85 63.38%	10 7.69%	20 15.38%	15 11.53%	**130** **100%**
3.	Integration of telecommunication gadgets enhances the visibility of library services in the digital era.	20 15.38%	18 13.84%	90 69.23%	2 1.53%	**130** **100%**
4.	Telecommunication technologies helps library initiate innovate community programmes.	88 67.69%	30 23.07%	11 8.46%	1 0.76%	**130** **100%**
5.	The use of telecommunication gadgets has strengthened the librarian's role as a change agent.	90 69.23%	20 15.38%	18 13.84%	2 1.53%	**130** **100%**

Key: Strongly Agree (SA) - Agree (A) - Strongly Disagree (SD) – Disagree (D)

From Table 1 above, the respondents indicated that. Out of the 130 respondents, 70 respondents (53.84%) accepted that Telecommunication gadgets improve access to library service for underserved communities. 85 (63.38%) respondents agreed that Information professionals use telecommunication tools to engage more effectively with community members. 90 (69.23%) respondents rejected that Integration of telecommunication gadgets is not enhancing the visibility of library services in the digital era which stand rejected, 88 (67.69%) respondents accepted that Telecommunication technologies helps library initiate innovate community programmes, and 90 (69.23%) of the respondents accepted that, the use of telecommunication gadgets has strengthened the librarian's role as a change agent.

For instance, Azubuike (2023) asserted that the integration of Information and Communication Technologies (ICTs) has repositioned libraries as active participants in community development through innovative outreach and knowledge-sharing initiatives. Similarly, Oladokun et al. (2024**)** highlighted that the adoption of telecommunication gadgets enables librarians to extend services beyond traditional boundaries, fostering inclusivity and enhancing access to information among underserved populations.

Research Question 2: What are the Challenges faced by Equipping Libraries and Information Science Professionals as Agents of Change in the 5th Industrial Revolution?

Table 2: Percentage responses on the challenges faced by Equipping Libraries and Information Science Professionals as Agents of Change in the 5th Industrial Revolution.

S/N	ITEM STATEMENT	S A	A	S D	D	TOTAL
1.	Inadequate funding limits the integration of modern technology in libraries.	100 76.92%	10 7.69%	5 3.84%	15 11.53%	**130** **100%**
2.	Lack of training opportunities prevents librarians from fully utilizing emerging technologies.	74 56.92%	33 25.38%	4 3.07%	19 14.61%	**130** **100%**
3.	Resistance to change among library staff and members of community hinders digital transformation efforts.	83 63.84%	8 6.15%	22 16.92%	17 13.07%	**130** **100%**
4.	There is shortage of skilled ICT professionals in many libraries and community settings	65 50.00%	28 21.53%	9 6.92%	28 21.53%	**130** **100%**
5.	Data privacy and security concerns limit the use of digital tools in libraries and community engagement.	5 3.84%	6 4.61%	8 6.15%	111 85.38%	**130** **100%**

Key: Strongly Agree (SA) - Agree (A) - Strongly Disagree (SD) – Disagree (D)

From Table 2 above, the respondents indicated that. Out of the 130 respondents, 100 respondents (76.92%) accepted that In-adequate funding limits the integration of modern technology in libraries to a high extent, 74 (56.92%) 83 respondents strongly agreed that; Lack of training opportunities prevents librarians from fully utilizing emerging technologies. 83 (63.84%) respondents accepted that; Resistance to change among library staff and members of community hinders digital transformation efforts, 65 (50.00%) respondents accept that; There is shortage of skilled ICT professionals in many libraries and community settings, while 111

(85.38%) of respondents rejected that Data privacy and security concerns limit the use of digital tools in libraries and community engagement.

Discussion of Findings

The study revealed that the majority of the respondents indicated that Telecommunication gadgets improve access to library service for underserved communities. Which are considered accepted. Information professionals use telecommunication tools to engage more effectively with community members is also accepted by the respondents. Telecommunication technologies helps library initiate innovate community programmes and The use of telecommunication gadgets has strengthened the librarian's role as a change agent were both consider accepted by respondents which scored above 50% While Integration of telecommunication gadgets enhances the visibility of library services in the digital era remain rejected by the respondents which score below 50%. This is in line with the findings of. (Azubuike, 2023) in his paper titled "*The role of information and communication technology (ICT) in transforming library operations and management into digital knowledge hub"* they focused on achieving community development and transformation services.

The study further revealed that challenges facing the library and community members in its effort to provide services that will lead to community development and transformation includes Inadequate funding, Lack of training opportunities, Resistance to change, Shortage of skilled ICT professionals were all consider accepted by the respondent which scored above 50% by respondents, while Data privacy and security concerns limit the use of digital tools in libraries and community engagement are considered as not challenge to the transformation process which scored below 50%. This is in line with the findings of. (IFLA, 2024) in their paper titled "*Digitalization in libraries: the challenges of preservation and accessibility"* they stated that the challenges facing public libraries towards community development services in Nigeria.

Conclusion

Equipping libraries and information science professionals as agents of change in society during the 5th Industrial Revolution is essential for fostering innovation, enhancing community engagement, and promoting equitable access to information. As the landscape of information management evolves with the integration of advanced technologies, libraries must adapt to meet the changing needs of their communities. This adaptation requires a strategic focus on developing the necessary skills and competencies among information professionals.

To effectively serve as change agents, information professionals must embrace continuous learning and interdisciplinary collaboration. They need to acquire not only technical skills related to emerging technologies but also soft skills such as effective communication, emotional intelligence, and problem-solving abilities. These competencies will enable them to navigate the complexities of the 5th Industrial Revolution and respond to the diverse needs of users.

However, several challenges must be addressed to facilitate this transformation. These include inadequate funding, insufficient institutional support for professional development, and resistance to change within organizations. Overcoming these barriers will require a concerted effort from stakeholders, including government bodies, educational institutions, and library organizations, to create an environment that prioritizes innovation and continuous improvement. By investing in the training and resources necessary for information professionals, libraries can enhance their role as vital community hubs and empower these

professionals to drive positive change in society. This proactive approach will not only benefit the information profession but also contribute to the overall progress and sustainability of communities in the context of the 5th Industrial Revolution. This goes in line with **(**Oladokun, et al 2024).

Recommendations

Addressing the challenges facing libraries in the integration of telecommunication gadgets during the Fifth Industrial Revolution requires a multifaceted approach. Here are some strategies to overcome the listed challenges:

i. To enhance the role of information science professionals as agents of change, libraries should invest in capacity building and professional development focused on emerging telecommunication technologies. Establishing continuous training programmes and mentorship systems will help librarians acquire both technical and soft skills needed to effectively deploy telecommunication tools for innovative service delivery. Collaborations with educational institutions, technology providers, and professional associations should be strengthened to facilitate workshops, online courses, and hands-on learning experiences. Moreover, fostering an inclusive and innovation-driven culture within libraries can help mitigate resistance to change among staff and users. Open communication about the benefits of digital transformation, coupled with community engagement initiatives such as forums and workshops, will encourage active participation, creativity, and adaptability among librarians and community members alike.

ii. To address the challenges identified—such as inadequate funding, shortage of skilled ICT professionals, and limited institutional support—libraries must adopt a strategic and collaborative approach to resource mobilization and workforce development. Management should actively pursue funding through partnerships with government agencies, private organizations, and non-profit bodies, as well as explore grants and crowdfunding opportunities to support technological integration. Additionally, policies that advocate for increased budgetary allocations to library services are essential for long-term sustainability. To overcome the shortage of ICT professionals, libraries can collaborate with universities to establish internship and apprenticeship programmes that attract new talent into the field. Offering competitive remuneration, career growth opportunities, and conducive working environments will also help retain skilled professionals. Through these efforts, libraries can build a resilient workforce capable of driving innovation and sustaining technological progress in the Fifth Industrial Revolution.

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