

COMPETENCY REQUIREMENTS AND GAPS FOR DIGITAL INFORMATION SERVICE DELIVERY: A CASE STUDY OF THE KENYA NATIONAL LIBRARY SERVICE

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ABSTRACT

The Kenya National Library Service (KNLS) has made substantial investments in digital infrastructure and service platforms, but there is still little empirical data on whether personnel competencies meet the requirements of providing digital information services. The competency needs and gaps for providing digital information services at KNLS, Nairobi, were investigated in this study. An embedded mixed-methods case study design with a qualitative predominance was used. 65 KNLS headquarters employees made up the target population: 50 librarians, 6 department heads, and 9 executive leaders. Executives and department heads were chosen using census sampling, whereas librarians were chosen through systematic sampling. Structured questionnaires with open-ended and ordinal items were used to gather the data, and descriptive statistics and structured thematic content analysis were used for analysis. The results indicated that employees gave priority to information retrieval ($M = 4.48$), digital content management ($M = 4.56$), and database searching ($M = 4.72$). However, significant gaps were found in advanced domains, particularly in digital content management ($M = 3.36$), digital preservation and archiving ($M = 2.88$), and data analysis and visualization ($M = 2.64$). Librarians exhibited more deficiencies in advanced technical areas than executive and administrative professionals when gaps were broken down by staff level. With established basic operational competence but inconsistent advanced digital transformation capabilities, KNLS is situated at an intermediate stage of digital maturity.

The study comes to the conclusion that providing digital information services effectively necessitates a contextualized combination of advanced and fundamental skills backed by role-aligned development. It recommends that KNLS and similar public library institutions implement differentiated digital competency programs, give data analytics, digital preservation, and content management top priority, and implement ongoing competency evaluation systems.

Keywords: *Kenya National Library Service; Professional Knowledge Skill Base; Digital Competencies; Delivery of Digital Information Services; Competency Gaps*

1. BACKGROUND

Libraries have long been associated with the organization, distribution, and preservation of knowledge. They were once thought of as print collection repositories, but they are currently changing into service-oriented, technologically advanced information centers. The growth of digital technologies like cloud computing, artificial intelligence (AI), the Internet of Things (IoT), and mobile applications has accelerated this change (Abedayo et al., 2018; Gradmann, 2014). Libraries are being forced to embrace new service models that prioritize digital access and user interaction as a result of these developments, which have completely changed how information is created, saved, retrieved, and consumed (IFLA & UNESCO, 2022).

By offering quicker and more flexible access to information, integrating information and communication technologies (ICTs) into library operations boosts productivity, lowers operating costs, and raises user satisfaction (Bhoi, 2017). Instantaneous, customized, and networked services are becoming more and more expected by modern consumers. Research indicates that user happiness and the caliber of staff-user interactions are closely related to library performance outcomes (Arinola et al., 2012; Emezie & Nwohiri, 2013). As a result, libraries need to recruit and continuously train employees in ICT skills and research abilities to meet evolving service expectations. Adekoya (2018) highlights the strategic significance of human capacity in technological transition by emphasizing the direct connection between sustainable library development and the efficient use of ICTs.

Librarians are urged to rethink their professional roles along the information delivery process chain as transformational technologies transform information behaviors. Cowley (1982) and other early observers predicted that new professional skills will be needed as a result of automation and employment reorganization. This paradigm change was highlighted by the creation of the "systems librarian" position during the mid-1990s (Tyson, 2007). Subsequent studies revealed that librarians' proficiency with ICT implementation and Internet-based system management persisted into the twenty-first century (Msadabwe, 2000; Prestamo, 2001; Mathews & Pardue, 2009).

To assist continuous capacity building, professional bodies around the world have created frameworks for digital competency. Core ICT competencies, such as integrated library systems, developing web technologies, electronic resources management, institutional repositories, and database administration, have been highlighted by the Canadian Association of Research Libraries (CARL, 2010) as standards for professional competence. These frameworks are helpful references for other technologically advanced environments, even though they were created for the Canadian context. However, local infrastructure and personnel preparedness determine its applicability in developing areas.

ICT uptake in libraries varies throughout Africa. According to studies conducted in Nigeria, in order for instructional and library personnel to carry out their jobs efficiently, they must be proficient in Internet usage, library software, and other technological areas (Ngozi, 2010).

The Special Libraries Association (2016) similarly underscored the need for librarians to create and manage cost-effective information systems that meet the needs of diverse communities. However, ongoing technophobia and low ICT literacy continue to limit many African librarians (Eke, 2012). In Kenya, Amollo (2011) identified the high cost of skilled personnel as a major barrier to digitization, while Kiprotich (2016) demonstrated that improving staff ICT skills at Maasai Mara University enriched information retrieval, learning efficiency, and decision-making. Nyambeki (2016) also observed that although university libraries showed a strong commitment to automation, staff ICT training remained insufficient.

These findings support a common conclusion: human resources' readiness and aptitude for managing and innovating in digital contexts are more crucial to the success of library digitization than technology infrastructure. This is in line with UNESCO's (2019) demand that public librarians become more proficient in ICT and e-literacy as a prerequisite for equitable social and developmental outcomes. As technology develops, its advantages can only be realized by competent experts who have the institutional support and authority to use these tools efficiently.

In accordance with national digital transformation plans, the Kenya National Library Service (KNLS), the nation's statutory library system, has made large expenditures in ICT infrastructure and digital service initiatives. Nonetheless, there are also concerns regarding whether the present human resource capability is adequate to sustain and optimize these breakthroughs. The complexity of digital service environments and rapidly shifting user expectations necessitate ongoing organizational support, staff empowerment, and training. A basic concern is raised by this circumstance: how are KNLS library and information staff equipped to deliver efficient digital information services in light of these societal and technological shifts?

2. PROBLEM STATEMENT

The demand for digitally competent, institutionally supported library personnel has been exacerbated by the increasing adoption of digital technologies in libraries, which has also raised expectations for the delivery of effective digital information services (IFLA–UNESCO, 2022; UNESCO, 2019). The Kenya National Library Service (KNLS) has responded by investing in ICT infrastructure, digital platforms, and technology-enabled service initiatives to enhance access to information and accommodate the changing requirements of users (Atuti, 2016; Atuti, 2017; KNLS, 2022).

Although these investments and ongoing digital initiatives have been made, there is insufficient empirical evidence to determine whether KNLS has the necessary human resource capacity to effectively support and sustain the delivery of digital information services. In particular, it is uncertain whether staff competencies are in accordance with the emerging professional digital competency requirements and whether the existing empowerment mechanisms and institutional support structures are sufficient to facilitate the effective and continuous development of those competencies within the organization. Existing studies have shown that many library institutions continue to face competency gaps, limited opportunities for continuous professional development, and institutional constraints that affect staff preparedness for digitally mediated service

environments (Hussain & Nayab, 2021; Asiri & Finlay, 2025). Although investments in ICT infrastructure have increased, staff ICT competencies, training opportunities, and organizational support mechanisms frequently remain insufficient to sustain effective digital services, according to studies conducted in Kenyan and African library contexts (Amollo, 2011; Kiprotich, 2016; Nyambeki, 2016; Eke, 2012). However, comparatively little conceptual and empirical attention has been paid to how staff competencies, empowerment mechanisms, and institutional support structures collectively shape human resource capacity for sustainable digital information service delivery within library systems like KNLS. Instead, a large portion of the existing literature has concentrated on technological adoption and infrastructure development.

As a result, it is still unclear how well-equipped KNLS's workforce is to handle the demands of increasingly complex digital information services. This knowledge gap restricts institutional comprehension of the organizational support circumstances, empowerment, and capabilities needed for long-term delivery of digital information services. In order to increase the delivery of digital information services, a thorough assessment of KNLS's human resource capacity is required in order to pinpoint current gaps in institutional and competency capacity as well as to create a framework for developing human resource capacity.

Research Questions

To address the identified problem, this study was guided by the following research questions:

1. Which competency domains are considered necessary for effective digital information service delivery at KNLS?
2. What gaps exist between KNLS staff competencies and the contextualized competency requirements for digital information services delivery at KNLS?

1.3 Significance and Contribution

Libraries must develop human resource capability to support efficient delivery of digital information services in light of the increasing digitization of information environments. This study is important because it offers actual data on the competences and capacity conditions that affect the Kenya National Library Service's (KNLS) ability to provide digital information services.

The study theoretically contributes to our understanding of how human resource capacity influences the provision of digital information services in libraries that serve the general public. The study demonstrates how competencies interact with institutional factors to shape workforce readiness for digital services by integrating competency-based professional standards with the Digital Information Services (DIS) framework. By providing context-specific evidence from a Kenya National Library Service and demonstrating how contextualized competency requirements either support or impede the efficient application of digital competencies, the findings expand on previous research.

Practically speaking, the study gives KNLS management empirical data on training goals, staff competency gaps and strengths, and institutional limitations influencing the provision of digital information services. These results can help improve digital service capabilities through competency evaluation, role-aligned professional training, evidence-based staff development planning, and institutional decision-making.

Academically, the study adds to the comparatively small body of empirical research on the ability of human resources to provide digital information services in African library systems that serves

the general public. The results offer context-specific proof of the connections between KNLS's digital service capabilities, institutional support circumstances, and skills. Future comparative studies and other research into how workforce competency affects digital service outcomes in public-sector information environments may benefit from the findings.

3. LITERATURE REVIEW

2.1 Digital Information Services in Contemporary Libraries

The capabilities, institutional frameworks, and workforce expectations required for the delivery of digital information services have been drastically altered by the increasing integration of digital technology into library and information service contexts. Libraries, such as Kenya National Library Service, are now viewed as digitally mediated service environments that facilitate digital literacy, online learning, electronic information access, and technology-enabled user involvement rather than just being repository of print collections. As a result, the ability of human resources to support, administer, and maintain digital information services is becoming just as important to their efficacy as technology infrastructure.

The evolving service orientation of libraries in digitally mediated information settings is reflected in the idea of Digital Information Services (DIS). Libraries used to be primarily print-based establishments, but thanks to advancements in information and communication technologies, they are now hybrid, digitally enabled service environments that facilitate digital literacy, electronic information access, remote services, and virtual user engagement (Trivedi, 2015; Ehrenberg et al., 2024). Online catalogs and discovery systems, licensed electronic resources, virtual reference services, digital literacy support, remote information access platforms, and technology-assisted user services are examples of modern digital information services.

ICT applications in libraries now cover almost every functional area, according to the literature (Hoque, 2023; Kauser & Popat, 2022). These applications include cataloging, circulation management, electronic resource administration, digital repositories, virtual reference services, remote access systems, and digital preservation platforms. Federated search systems, institutional repositories, discovery tools, online public access catalogs (OPACs), integrated library management systems, and remote authentication technologies have combined to change libraries from geographically restricted establishments into networked service environments that assist patrons outside of actual library facilities.

ICT adoption has enhanced operational efficiency, resource sharing, service accessibility, and user convenience in library settings, according to numerous studies (Chukwunaza, 2019; Hoque, 2023). Libraries can now offer ongoing access to electronic resources, help for digital literacy, and virtual user assistance thanks to Internet-based technologies and cloud-enabled systems. Similarly, to enhance automation, personalized information retrieval, inventory management, and user interaction, new technologies like radio-frequency identification (RFID), artificial intelligence (AI), and Internet of Things (IoT) applications are being incorporated into library operations more frequently (Das & Islam, 2021; Hussain, 2023).

The literature does, however, also show that technological advancements have made workforce competency standards more stringent and also increased the complexity of library service environments. Systems administration, metadata management, information governance, digital content curation, cybersecurity awareness, troubleshooting, and user support in virtual

environments are among the competencies required by the transition from print-centered operations to digitally integrated systems. As a result, ICT deployment in libraries increasingly operates as a capacity-dependent process where organizational efficiency is dictated not just by technological availability but also by the institutional support structures and competences accessible to library staff. The claim that investments in ICT infrastructure by themselves do not always result in efficient delivery of digital information services is one that frequently appears in the literature. The sustainability of digital library initiatives is frequently hampered by inadequate staff competencies, a lack of opportunities for professional development, unstable infrastructure, and a lack of institutional support, according to studies conducted in library contexts in developing nations (Chukwunaza, 2019; Kauser & Popat, 2022). This implies that the gap between institutional digital aspirations and actual service delivery may grow if technical modernization is not accompanied by investments in human resource development.

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Competency for Information Professionals

Because the efficacy of modern information services increasingly rests on professionals' capacity to function in technologically dynamic, user-centered environments, competency continues to be a key concept in library and information science studies. The literature increasingly views competency as a multidimensional construct that includes professional expertise, cognitive ability, ethical orientation, adaptability, communication skills, and the ability to apply knowledge effectively within particular organizational contexts, despite the fact that competency is typically associated with knowledge and technical skills (Singh et al., 2025; Mustar & Rahmadanita, 2023).

There is widespread agreement in the reviewed literature that the competency requirements for information professionals have changed dramatically in response to digital information environments. A recurrent theme in the literature is that modern libraries serve as digitally mediated service organizations that facilitate electronic information access, remote services, digital literacy, information governance, and user engagement across various technological platforms rather than just serving as custodians of physical collections. As a result, it is becoming more and more necessary for information professionals to have abilities that combine technical proficiency with management, analytical, instructional, and service-oriented roles. Research repeatedly demonstrates that the interaction between labor competence and technology systems is essential to the delivery of digital information services. Libraries continue to make investments in digital platforms and ICT infrastructure, but research indicates that these investments' efficacy is primarily dependent on the skills of the people in charge of maintaining, managing, and supporting these systems. For instance, the Special Libraries Association (SLA, 2015) defines professional competence as the application of integrated managerial, technical, and information service skills in changing organizational settings.

According to scholars, the lifespan of professional skills has been significantly shortened by rapid technological change, necessitating lifelong learning and ongoing professional development for information professionals to stay productive in service environments that are changing digitally (Asiri & Finlay, 2025; Pandey & Madhusudhan, 2024). The literature does, however, also draw attention to continuous conflicts between the institutional ability to enable continued professional growth and the quickly rising competency standards. Empirical research also shows that the

competencies needed in modern library settings go beyond simple ICT literacy. Effective digital service delivery requires competencies in information retrieval, electronic resource management, digital content curation, systems administration, web technologies, digital literacy instruction, user support, and information governance, according to research in digital library contexts (Kwanya & Underwood, 2012; Bowden, 2005; SLA, 2015; Pandey & Madhusudhan, 2024; Joel, 2021). Additionally, more recent research highlights the importance of analytical skills, flexibility, digital communication, problem-solving, and innovation readiness as professional qualities in technologically dynamic settings (Tang et al., 2024).

However, the literature also demonstrates that competency standards are not consistent or universally achievable in different institutional contexts. Studies conducted in African and developing-country library environments often report uneven competency profiles, with stronger foundational ICT capabilities but weaker advanced technical and analytical competencies, despite the fact that internationally developed competency frameworks offer broad professional standards (Ubaga, 2025; Agava, 2020; Rutto et al., 2025). These findings imply that competency should be viewed as a context-dependent skill influenced by institutional resources, organizational culture, training opportunities, and technological exposure rather than as a universal professional condition.

Digital Competencies and Competency Frameworks

Since digital information services are now a fundamental part of public library mandates and user expectations, digital capabilities have become a defining necessity for modern library and information professionals. The IFLA–UNESCO Public Library Manifesto (2022) places support for digital literacy and digital access as key public library missions on a global scale. This means that library employees must have the skills necessary to provide services both locally and remotely via digital technologies (KNLS, 2022). The literature warns that, notwithstanding the global emphasis of this policy direction, staff competency, continuous professional development, institutional support, and ICT infrastructure are all necessary to translate digital mandates into effective services. In addition to ICT infrastructure, services also depend on institutional support, staff competency, and continual professional growth.

From a definitional perspective, rather than being a collection of distinct technical capabilities, digital competence is increasingly recognized as a multidimensional construct that incorporates knowledge, skills, and attitudes. For instance, the European Commission's DigComp 2.2 framework offers comprehensive examples of knowledge, skills, and attitudes at each competence level and defines digital competence through related domains (such as information/data literacy, communication and collaboration, digital content creation, safety, and problem-solving) (Vuorikari et al., 2022). Equally, UNESCO strengthens the idea that digital competence should be operationalized as an integrated set of skills (including safety and problem-solving), adaptable to local contexts, and measurable through defined competence areas by advancing a global reference framework for digital literacy skills (Law et al., 2018). These frameworks are especially pertinent to library settings since digital information services necessitate professionals to combine technical expertise (e.g., platforms, systems use, and e-resources) with user assistance skills (e.g., digital guiding, instruction, and mediated access).

Competence is presented as a workforce requirement rather than a personal preference in LIS-specific professional standards. The CILIP Professional Knowledge and Skills Base (PKSB) is a

sector skills standard that facilitates the planning of professional development and the assessment of capability needs. The new PKSB places more emphasis on data-related and digital skills (CILIP, n.d.; CILIP, 2021). With ethics and values at its core, which serve as the foundation for a variety of general skills and professional expertise, the PKSB describes the wide range of knowledge and abilities needed across the profession (CILIP, n.d.). Because they offer defined standards for comparing the actual competencies of KNLS staff with desired professional competency requirements, these frameworks are pertinent to the current study. According to the research, credible benchmarking necessitates the precise definition of expected competence areas and empirically supported staff capability measures in relation to those domains.

Even in settings with well-established workforce plans and developed digital ecosystems, competency gaps are prevalent, according to empirical studies. Despite an explicit organizational and professional emphasis on digital service readiness, Asiri and Finlay's (2025) study of public library professionals in England reveals that staff perceive barriers to improving digital competencies, such as staffing constraints and limited professional development opportunities. According to the survey, most employees are comfortable using digital tools and helping library users, but they lack the confidence to apply new technologies, handle typical technical problems, and have programming abilities (Asiri & Finlay, 2025). This study is important because it demonstrates that continuous investment in staff development and enabling conditions is necessary to ensure digital competency, which cannot be assumed from institutional digitization efforts alone.

Evidence from Kenya and the surrounding region also shows diverse competency profiles, which are typically characterized by good foundational ICT abilities but lesser advanced or technical competencies. Agava's (2020) case study of LIS professionals in a Kenyan university library revealed very high proficiency in some web technologies and basic ICT skills, but significant shortcomings in technical ICT skills, like networking, along with limitations like time, money, training opportunities, and ICT obsolescence. The competency pattern and institutional constraints are instructive for KNLS even though the setting is academic rather than public librarianship. This is because digital service delivery across library types frequently depends on similar digital infrastructures (networked platforms, e-resource access, web services) and organizational support mechanisms (training time, funding, equipment, policy). Ubaga (2025) reported generally high competence in basic and intermediate skills but only moderate competence in advanced ICT skills in a related Kenyan study on librarians' preparedness for AI-enabled services. This finding raises questions about the depth of digital capability required for changing service environments. In a similar vein, Rutto et al. (2025) discovered that although Kenyan university library employees have fundamental ICT abilities, they urgently need ongoing upskilling to be relevant in a fast digitizing academic environment.

Additionally, locally grounded competency constructs that can improve benchmarking criteria have been supplied by Kenyan LIS literature. ICT skills are crucial, along with interpersonal, management, and research skills, according to Kwanya's (2012) study on a competency index for research librarians in Kenya. This suggests that digital competence should be assessed in connection to both technical and professional service capabilities.

Organizational policy in the KNLS context indicates a strong commitment to providing services supported by technology, but policy intent does not take the place of actual workforce competency data. The KNLS Strategic Plan (2022–2027) strengthens the argument for determining if staff competencies are in line with the organization's digital goals and service duties by outlining

organizational priorities and commitments around technology and service delivery (KNLS, 2022). The literature thus supports framing the current study as an organized benchmarking exercise: digital competencies should be defined using reliable frameworks (e.g., DigComp, UNESCO digital literacy reference), contextualized using LIS professional standards (e.g., PKSB), and assessed using competency domains that are empirically supported and visible in Kenyan library environments (e.g., depth of ICT competence and technical skill gaps).

Research Gap

The literature review identifies a number of enduring gaps. First, there is no empirical data regarding the applicability of international competency frameworks in African public library systems, especially in Kenya, despite the fact that these frameworks offer broad professional standards. Second, competency alignment in Library systems receives relatively little attention, with the majority of studies concentrating on academic libraries or technology uptake. Third, current research frequently looks at technology adoption, training, or competences separately, with little conceptual integration of institutional conditions and competency requirements as interconnected aspects of labor capacity. Fourth, the Kenya National Library Service has not yet undergone a contextualized competency benchmarking study. In order to close these gaps, this study looks at KNLS's competency standards and uses a methodical, theory-based methodology to identify skill gaps.

Theoretical Review

Digital information Services (DIS as Service-Demand Construct

Libraries' changing service orientation in digitally mediated information settings is reflected in Digital Information Services (DIS). Libraries used to be primarily print-based establishments, but thanks to advancements in information and communication technologies, they are now hybrid, digitally enabled service environments that facilitate digital literacy, electronic information access, remote services, and virtual user engagement (Trivedi, 2015; Ehrenberg et al., 2024). Online catalogs and discovery systems, licensed electronic resources, virtual reference services, digital literacy support, remote information access platforms, and technology-assisted user services are examples of modern digital information services.

While digital collections and technology infrastructures are widely discussed in the literature on digital libraries (Candela et al., 2011; Manning, 2008), relatively few studies conceptualize digital information services as staff-dependent service systems that need institutional support structures and specialized competencies. DIS is consequently viewed in this study as a service-demand architecture that outlines the operational, technological, and user-centered needs influencing workforce competency standards. The contextual basis for identifying the type of digital service delivery, the intricacy of the necessary skills, and the institutional circumstances required for efficient service performance is provided by DIS.

CILIP Professional Knowledge and skills Base (PKSB)

The study needed a defined professional competency framework that could benchmark both technical and transferable competencies pertinent to modern library contexts in order to determine if KNLS employees have the skills necessary for providing efficient digital information services.

There exist several international competency models in library and information science, which includes American Library Association (ALA, 2009, 2013), the Australian Library and

Information Association (ALIA, 2014), the Association of Research Libraries (ARL, 2016), and the Canadian Association of Research Libraries (CARL, 2020) However, the Chartered Institute of Library and Information Professionals' (CILIP) Professional Knowledge and Skills Base (PKSB) (CILIP, 2021) was deemed most appropriate because it is globally recognized, incorporates both technical and generic competencies, reflects modern digital information environments, and supports cross-sector professional applications.

Developed in collaboration with employers, practitioners, industry experts, and learning providers, the PKSB is the sector skills standard for the information, knowledge, library, and data profession (CILIP, n.d.). With a core set of principles and values that serve as the foundation for a variety of general skills and professional competence, it describes the wide range of knowledge and abilities needed across the profession (CILIP, n.d.). Eight professional knowledge areas, four generic professional capacity domains, and a foundation of ethics and professional values make up the PKSB. PKSB integrates competences in digital technologies, information governance, service design, leadership, communication, and organizational strategy, in contrast to competency models that mainly concentrate on traditional library functions. As a result, its comprehensive competency architecture provides an appropriate standard for determining the competencies needed to provide digital information services, evaluating the competencies of current employees, and finding competency gaps.

Integrated Analytical Logic

This study's integrated analytical logic is predicated on the idea that institutional support mechanisms, contextualized professional competency needs, and digital information service demands must all be strategically aligned for effective delivery. In this cohesive theoretical framework:

- The type, extent, complexity, and operational requirements of digitally mediated information service environments are defined by the Digital Information Services (DIS) construct;
- The professional competency reference domains offered by the CILIP Professional Knowledge and Skills Base (PKSB) direct the interpretation of the knowledge, technical skills, general capabilities, and ethical underpinnings related to efficient delivery of digital information services.

The main question of the study, which is whether KNLS has enough human resource capability to maintain efficient digital information service delivery in a library setting that is digitally developing, is directly addressed by this integrated logic.

4. METHODOLOGY

Research Design

This study used an embedded, mixed-methods, qualitative-dominant approach in a single-case study design. In order to provide a more thorough grasp of the research problem, mixed-methods research combines qualitative and quantitative techniques inside a single study (Creswell & Plano Clark, 2018). This study's methodological integration was made possible by its pragmatic philosophical perspective, which improved problem-solving and explanatory depth.

The study employed an embedded (nested) mixed-methods design, wherein one form of data serves as a supporting element within a larger primary design (Creswell and Plano Clark 2011). Qualitative inquiry predominated in this study, while quantitative components were used into the

analytical stage to improve comparability and pattern recognition. The study's objectives served as the basis for the rationale behind using a mixed-methods approach with a qualitative predominance. Assessing competency requirements and identifying capacity gaps requires structured comparisons across professional domains using the CILIP Professional Knowledge and Skills Base (PKSB). At the same time, examining institutional support mechanisms and empowerment practices requires an interpretive understanding of organisational processes and contextual realities.

The Kenya National Library Service (KNLS) headquarters in Nairobi was the subject of this study, which used a single-case study design. When examining modern organizational phenomena in their actual settings, case study approach is suitable, especially when contextual factors have an impact on the phenomenon being studied (Yin, 2018). This study examines how KNLS's organizational structures, leadership styles, institutional policies, and resource environments all contribute to human resource capability for the provision of digital information services. The problem cannot be fully comprehended outside of its institutional framework since these contextual factors directly influence staff competencies, empowering processes, and the capacity to supply digital information services. In accordance with Yin's (2018) typology, this study adopted a single-case embedded design. Three analytically separate subunits - executive leadership, department heads, and librarians - were studied within the Kenya National Library Service headquarters, which was used as the single case.

Study Context

The Kenya National Library Service (KNLS) is a statutory body established by an Act of Parliament, Cap 225 of the Laws of Kenya, in April 1965, with a mandate to develop, promote, establish, and equip libraries nationwide (KNLS, 2022). Following the promulgation of the Constitution of Kenya (2010) and the subsequent devolution of certain national functions, the management of public libraries was transferred to county governments, effective 1 July 2023. As a result, 61 branch libraries were devolved to county governments. In contrast, three facilities - the KNLS Headquarters at the Maktaba Kuu Building (Upper Hill, Nairobi), Buruburu, and Nakuru libraries - remained under the national government to handle strategic functions such as policy coordination, national bibliographic control, and professional capacity building.

As "the information hub for knowledge development," KNLS strives to preserve the nation's documentary heritage and make information and knowledge accessible to all (KNLS, 2022). The organization's dedication to incorporating ICTs into service delivery is reflected in its core principles, which include technology-driven innovation, client focus, and knowledge-based service. KNLS has made significant investments in ICT infrastructure, electronic resources, and user-focused digital platforms in accordance with Kenya's national digital transformation plan. On July 12, 2023, the organization introduced v-tabu, a virtual library platform that is said to as "a library without boundaries," in order to expand access beyond physical branches. Supported by the Kenyan government, v-tabu offers 24-hour access to databases, e-books, and educational resources, demonstrating the institution's attempts to overcome social and geographic barriers to information access (KNLS, 2022). Previous digital projects show how KNLS has gradually adjusted to the needs of its users. For example, KNLS introduced e-readers with 35–100 digital books per library in partnership with Worldreader to encourage young people and school-age users to read (Atuti, 2016). Additionally, the organization has access to scholarly resources by subscribing to electronic databases through the Kenya Libraries and Information Services Consortium (KLISC) (Nyaga, 2017).

Target Population

The target population included staff at the Kenya National Library Service (KNLS) headquarters in Maktaba Kuu, Upper Hill, Nairobi. As of December 2023, the total staff complement at Maktaba Kuu comprised sixty-five (65) employees directly involved in or strategically responsible for digital information service delivery. For analytical purposes, consistent with the embedded case study design, the population was divided into three strata:

- **Executive Leadership (9 staff members):** This category included the Director General, Directors, Deputy Directors, and Assistant Directors. These individuals are responsible for strategic decision-making, policy formulation, resource allocation, and oversight of institutional HR practices.
- **Heads of Departments (6 staff members):** This group oversees operational units that deliver digital information services. They translate strategic directives into operational practices and supervise staff performance.
- **Librarians (50 staff members):** Librarians constitute the primary workforce for service delivery. They interact directly with users, operate digital systems and electronic resources, and provide digital literacy services.

Table 1: Target Population at KNLS Headquarters, Maktaba Kuu, Nairobi

Category	Designation	Number
1	Director General, Directors, Deputy Directors, and Assistant Directors	9
2	Heads of Departments	6
3	Librarians	50
TOTAL		65

Source: Research data

Sampling Procedures

Given the study's single-case embedded design, sampling was structured to ensure representation across analytically distinct subunits within the KNLS headquarters. The study population of sixty-five (65) staff members was first stratified into three groups by institutional role. A census approach was used for executive leadership and department heads, comprising a total of fifteen (15) respondents (9 executives and 6 department heads). This decision was justified on methodological and substantive grounds: the small population size made full inclusion feasible, these respondents hold key decision-making positions responsible for policy formulation, training authorization, resource allocation, and empowerment mechanisms, and complete representation strengthened the analytical integrity of the embedded case.

The third stratum comprised fifty (50) librarians directly involved in delivering digital information services. Given the size of this group, systematic sampling using Yamane's Formula (for known

populations) was applied to select a representative subset while preserving procedural rigour, yielding a sample size of 44:

$$n = 50 / (1 + 50(0.05^2))$$

$$n = 50 / 1.125$$

$$n = 44.44$$

The study used a near-census systematic inclusion technique, inviting nearly all eligible librarians to participate because the intended sample size was extremely close to the target population. The goal of the study's qualitative-dominated embedded case study orientation was to generate sufficiently diverse operational perspectives to support institutional-level analysis of competency patterns, empowerment conditions, and digital service delivery experiences rather than to achieve statistical representativeness.

Nine executive leaders (census), six department heads (census), and forty-four librarians (systematic sample) made up the final sample, which had a total of 59 responses. A total of 25 completed surveys were returned, representing a 42% response rate: 6 executive executives (67%), 4 department heads (67%), and 15 librarians (34%).

Table 2: Response Rate by Respondent Category

Stratum	Sample Size	Returned	Response Rate (%)
Executive	9	6	67
Heads of Departments	6	4	67
Sub-total	15	10	67
Librarians	44	15	34
Total	59	25	42

Source: Research data

Data Collection

Data for this study were collected through semi-structured questionnaires, with a qualitative emphasis, administered to three respondent groups: librarians, heads of departments (HODs), and executive-level management. The instruments were designed to align directly with the study objectives and the theoretical constructs drawn from the CILIP Professional Knowledge and Skills Base (PKSB). Three separate yet conceptually aligned questionnaires were developed: one for librarians, one for heads of departments, and one for executive-level management. The differentiation enabled data collection across hierarchical levels, consistent with the embedded case study design.

The use of questionnaires rather than interviews was justified on the basis of organisational feasibility (respondents held managerial and operational roles and had limited availability), hierarchical comparability (structured formats enabled cross-level comparisons), and analytical

integration (the instrument design supported both narrative interpretation and structured quantification). Within Yin's (2018) typology, this approach supports an embedded single-case design by enabling data collection across sub-units (executive, managerial, and operational levels) while keeping the KNLS headquarters as the bounded institutional case.

Data Analysis

The analysis was guided by the CILIP Professional Knowledge and Skills Base (PKSB) competency domains and the research questions.

The primary analytic method was a structured thematic content analysis informed by Miles, Huberman, and Saldaña (2019) and Saldaña (2021). The analysis involved data familiarisation, open coding, codebook development, categorisation of recurring patterns, and theme development. The process involved: data preparation (transcription and anonymisation, with each respondent assigned a unique code such as L1–L15, H1–H6, E1–E9); familiarisation (multiple reviews of responses to identify emerging patterns, with analytical memos documenting preliminary interpretations); open coding (line-by-line coding reflecting both inductive categories emerging from data and deductive categories aligned to PKSB constructs); codebook development (a structured codebook including code label, definition, inclusion/exclusion criteria, example quotations, and linked research objective); and theme development (grouping codes into broader themes, including digital competency domains, infrastructure adequacy, empowerment mechanisms, institutional constraints, and development needs).

themes, including digital competency domains, infrastructure adequacy, empowerment mechanisms, institutional constraints, and development needs).

To enrich analytical rigour and support comparative institutional interpretation, selected coded qualitative responses were converted into numerical summaries, a process known as quantization (Sandelowski et al., 2009). Quantization was used in this study to identify recurring competency gaps, training priorities, and institutional constraints within the KNLS digital service environment; to examine variations in perceptions and experiences across hierarchical staff categories; to enhance consistency in interpreting dominant themes and recurring institutional patterns; and to support coherence within the qualitative-dominant embedded mixed-methods design by integrating descriptive numerical summaries with thematic interpretation. The quantified data were subsequently organised and analysed using descriptive statistics, including frequencies, percentages, means, and standard deviations. A comparative descriptive analysis was also conducted to examine variations in competency patterns across staff categories and organisational dimensions.

5. FINDINGS

Digital Information Services at KNLS

Respondents were asked to list the digital information services that the Kenya National Library Service (KNLS) currently provides in order to create the digital service environment in which human resource capacity was investigated. Although the distribution of services reflects different levels of institutional adoption and integration, the results show that KNLS has operationalized a wide range of digital information services.

Table 3: Digital Information Services Offered at KNLS (N = 25)

Service	Frequency	(%)
OPAC	22	88
E-resources access	20	80
Virtual reference	18	72
Digital literacy training	15	60
Institutional repository	12	48
Digitization	10	40
Social media	8	32
Mobile library	5	20

Source: Research data

The most common digital services were OPAC services (88%) and access to e-resources (80%), indicating that KNLS has given priority to digitally mediated access to electronic content and bibliographic information. A further indication of institutional accountability for online information help and remote user support is the high frequency of virtual reference services (72%). A significant percentage of respondents (60%) also mentioned receiving digital literacy training, indicating that KNLS is becoming more aware of the value of helping consumers navigate digital information settings. Services linked to more sophisticated digital transformation tasks, like digitization projects (40%), institutional repositories (48%), and mobile library services (20%), were less common.

The growing incorporation of digital information services into regular library operations was further demonstrated by qualitative replies. A librarian commented: "Most users now prefer accessing information electronically, especially through OPAC and online resources, so digital services have become part of our daily operations" (L4). A head of department added: "Remote access and electronic services have increased significantly, particularly for users who cannot physically visit the library" (H2). "KNLS has increasingly integrated digital services into its operations to improve accessibility and respond to changing information needs" (E3) is how an executive reaffirmed the growing integration of digital information services into KNLS's everyday service delivery.

Additionally, respondents were asked to list the main technological instruments and systems that facilitate the provision of digital information services.

Table 4: Tools and Systems Used for Digital Services (N = 25)

Tool/System	Frequency	(%)
Integrated Library System (ILS)	23	92
E-resources management system	19	76
Content management systems	16	64
Virtual reference software	15	60
Digital repository platforms	12	48
Learning management systems	10	40
Social media tools	8	32
Mobile applications	5	20

Source: Research data

The most frequently reported technology platform was the Integrated Library System (ILS) (92%), indicating that the institution's digital service operations are based on basic library automation tasks. Institutional investment in the organization, access, and management of licensed digital information is further demonstrated by the widespread adoption of e-resource management systems (76%). Similar to this, a sizable percentage of respondents mentioned content management systems (64%) and virtual reference software (60%), indicating the increasing integration of online user support and web-based information dissemination. Nonetheless, the comparatively low usage of social media tools (32%), mobile applications (20%), learning management systems (40%), and digital repository platforms (48%) suggests uneven technological diversity across new digital service platforms.

The findings indicate that KNLS's digital service delivery is still concentrated on operational, fundamental, and access-oriented digital operations. The prevalence of virtual reference services, electronic resource access, and OPAC systems suggests that KNLS has built the fundamental framework for digitally enabled library operations. However, unequal institutional growth across more sophisticated, user-centered, and innovation-oriented digital service domains is suggested by the comparatively lower incidence of institutional repositories, digitization services, and mobile outreach technologies. According to these results, KNLS is in the foundational-to-transitional stage of digital maturity.

Perceived Importance of Digital Competencies

Respondents were asked to rank the significance of particular digital abilities thought to be essential for KNLS's efficient provision of digital information services. The competency domains found in the CILIP Professional Knowledge and Skills Base (PKSB) guided the competencies that were analyzed, which were generated from the digital information service environment.

The findings show that information retrieval, database searching, digital content management, electronic resource assistance, and digital communication skills were highly valued by respondents. In the KNLS digital environment, competencies that directly assist operational digital service delivery were consistently regarded as the most crucial. Due to the institution's heavy reliance on OPAC services, electronic resource access platforms, and digital information retrieval systems, competencies in database searching and information retrieval were found to be particularly crucial. In a similar vein, it was regularly determined that maintaining access to digital information and coordinating services required competencies in electronic resource management, repository support, and digital content organization.

The findings also show that in increasingly technology-mediated service situations, competences in digital literacy facilitation, user support, and adaptable communication are being highly recognized. The significance of assisting users in successfully navigating digital information systems was repeatedly emphasized by respondents, indicating that KNLS's digital service delivery increasingly incorporates instructional and user-centered support responsibilities in

addition to traditional information management tasks. The increasing significance of technical flexibility and ongoing professional development was another recurrent trend. According to respondents, staff members must constantly refresh their knowledge and abilities in order to adapt to changing technology, new digital platforms, and rising consumer expectations in dynamic digital environments.

Contextualised Competency Domains for Digital Information Service Delivery at KNLS

Contextualized operational competency requirements for digital information service delivery at KNLS were created by synthesizing findings from the digital information service environment, the PKSB benchmark competency domains, and the perceived significance of digital competencies.

Table 5: Contextualised Competency Domains for Digital Information Service Delivery at KNLS

DIS Operational Area	Relevant Competency Requirement Identified in Findings	PKSB Competency Domain	KNLS Operational Competency Requirement
OPAC and retrieval services	Database searching and information retrieval	Using and Exploiting Information	Information retrieval and database navigation competency
Electronic resource access	Electronic resource management and digital access support	IT and Communication	Electronic resource access and support competency
Virtual reference services	Digital communication and online user support	IT and Communication	Online user support and digital communication competency
Digital literacy services	Digital literacy facilitation and user guidance	Literacies and Learning	User training and digital literacy competency
Institutional repository services	Digital content management and preservation	Information Governance	Digital content organization and preservation competency
Digitization services	Metadata organization and digital preservation support	Organising Knowledge and Information	Digitization and metadata management competency
Mobile and remote services	Adaptive digital communication and remote access support	IT and Communication	Adaptive digital service delivery competency

Source: Research data

The integrated competency domains that include technological capability, information management knowledge, user support abilities, and adaptive professional learning are necessary for KNLS to provide digital information services, according to the synthesized findings. Information retrieval, digital communication, digital access assistance, electronic resource management, and user-centered digital literacy facilitation were all closely linked to the main competency requirements found in the investigation

Staff Competency Levels

On a five-point Likert scale, with 1 denoting "not competent" and 5 denoting "very competent," respondents evaluated their own proficiency.

Table 6: Self-Reported Competency Levels

Competency Area	Mean	SD
Digital literacy/computer basics	4.12	0.78
Mobile/online resources access	3.84	0.94
Information retrieval/database management	3.68	1.03
Virtual reference tools	3.52	1.08
Digital content management	3.36	1.11
Social media management	3.24	1.20
Digital preservation/archiving	2.88	1.17
Data analysis/visualization	2.64	1.22

Source: Research data

The highest self-reported competency was recorded in digital literacy/computer basics ($M = 4.12$, $SD = 0.78$), suggesting that foundational ICT competencies are relatively well established among KNLS staff. Similarly, moderate competency levels were reported for access to mobile and online resources ($M = 3.84$, $SD = 0.94$), information retrieval and database management ($M = 3.68$, $SD = 1.03$), and virtual reference tools ($M = 3.52$, $SD = 1.08$). These findings suggest that staff generally possess operational competencies for routine digital information service delivery.

However, competency levels were substantially lower in more specialised and technically demanding digital domains, particularly digital preservation and archiving ($M = 2.88$, $SD = 1.17$) and data analysis and visualisation ($M = 2.64$, $SD = 1.22$). These findings indicate comparatively weaker competencies in advanced digital information service areas that require specialised technical expertise, analytical capability, and higher-order digital systems management.

A recurring pattern in the findings is the uneven distribution of competencies across the foundational, intermediate, and advanced digital service domains. Respondents generally demonstrated stronger competencies in operational and user-facing digital services, whereas lower competencies were consistently associated with advanced digital management, preservation, and analytical functions. This pattern suggests that KNLS has a relatively functional operational digital capacity but faces limitations in advanced digital transformation competencies.

Qualitative responses provided further context. One librarian explained: "Most staff are comfortable with routine digital services, but some advanced areas such as data analysis and digital preservation still require additional training" (L6). A head of department noted: "There is reasonable basic competence among staff, although more specialized digital competencies remain uneven" (H4).

The standard deviation values, ranging from 0.78 to 1.22, further indicate moderate variability in self-reported competency levels across domains. Lower variability in foundational digital literacy

competencies suggests greater consistency in basic ICT operational skills across staff categories. In contrast, higher variability within advanced competency domains suggests uneven exposure, training opportunities, and specialisation in technically demanding digital service areas.

Competency Gap Analysis

The study compared respondents' self-reported competency levels across the identified digital competency domains with their perceptions of key digital competencies in order to determine how closely current staff competencies match the contextualized competency requirements for digital information service delivery at KNLS.

Data analysis and visualization and digital content management showed the biggest capability gaps. These domains showed lower self-reported competency levels but very high perceived relevance. The results thus show significant differences between the current staff competencies in these domains and the contextualized competency needs for advanced digital information service delivery.

The results consistently show that higher-order digital competences linked to advanced digital transformation functions have the most competency gaps, as opposed to regular operational ICT tasks. Therefore, the results indicate that although KNLS has a reasonably functioning baseline digital service capability, advanced capabilities in technologically integrated information management, digital content management, and the use of analytical tools are still somewhat underdeveloped.

Information retrieval, digital preservation, and database administration all showed moderate capability gaps. The results show partial competency constraints in important operational digital service areas, even though these gaps were less noticeable than those seen in sophisticated analytical and digital content management domains. According to the findings, employees generally possess the fundamental operational skills needed for regular delivery of digital information services; however, in more demanding digital service environments, they might require additional training in advanced application, depth of use, and specialized technical capability.

Table 7: Benchmark–Empirical Alignment Matrix for Digital Competencies at KNLS

Benchmark Domain	Empirical Indicator	Self-Reported Mean	Observed Competency Gap	Alignment Interpretation
Information & Data Literacy	Digital literacy/computer basics	4.12	No substantial observable gap	Strong alignment
ICT Systems & Technology Use	Virtual reference tools	3.52	Minimal observed gap	Moderate alignment
Digital Content Management	Digital content management	3.36	Substantial observed gap	Significant misalignment
Information Retrieval & Analysis	Data analysis/visualization	2.64	Moderate observed gap	Critical misalignment
Digital Preservation	Digital preservation/archiving	2.88	Differentiated competency pattern	Developmental gap
Innovation & Adaptability	Comparative competency alignment patterns across staff categories	—	—	Differentiated competency alignment across staff levels

Source: Research data

Distribution of Competency Gaps Across Staff Levels

The competency patterns of the three major staff categories - executive leaders, department heads, and librarians - were compared in order to further investigate the distribution of competency gaps throughout the organization.

Table 8: Comparative Distribution of Competency Gaps Across Staff Levels

Staff Category	Dominant Competency Characteristics	Observed Competency Gap Pattern	Interpretive Summary
Executive Leaders	Strategic oversight; policy and planning responsibilities	Lower operational competency gaps, but limited advanced technical specialization	Stronger strategic digital orientation with less direct operational system engagement

Department Heads	Supervisory and coordination responsibilities	Moderate competency gaps across operational and managerial digital domains	Transitional competency profile balancing strategic and operational responsibilities
Librarians	Direct operational digital service delivery; user support	Higher competency gaps in advanced technical and analytical digital domains	Greater exposure to day-to-day digital service demands and emerging technical requirements

Source: Research data

The comparative patterns show that there is an unequal distribution of skill gaps throughout the hierarchical staff categories in KNLS. With relatively smaller capability gaps in ordinary digital service procedures, executive executives often demonstrated a stronger orientation toward strategic and managerial digital functions. Librarians, on the other hand, faced additional competency issues in advanced digital transformation domains, especially in analytical, technical, and emerging-technology responsibilities, because they are more actively involved in the daily supply of digital information services and user assistance. The competency profile of department heads was intermediate, with both operational and supervisory digital responsibilities.

Competency gaps are strongly associated with variations in institutional job structures, technical exposure levels, strategic responsibility, and operational involvement with digital systems, according to a recurrent pattern in the analysis. The findings therefore suggest that competency requirements within KNLS are not uniform across staff categories but instead reflect differentiated institutional expectations and digital service responsibilities.

5.7 Alignment of Staff Competencies with Contextualise Competency Requirements

The study synthesized the empirical findings against the previously defined contextualized competency criteria in order to consolidate information on staff competencies, competency gap patterns, and benchmark alignment.

Table 9: Alignment of Staff Competencies with Contextualised Competency Requirements at KNLS

Contextualise d Competency Requirement	Empirical Competency Indicator	Self- Reporte d Mean	Gap Status	Alignm ent Level	Institutional Interpretation
Digital literacy and ICT operations	Digital literacy/computer basics; routine ICT system use	4.12	Minimal observed competency gap	Strong alignment	Foundational operational digital competencies are well institutionalized across staff levels and support routine

					digital service delivery effectively.
Information retrieval and database management	Information retrieval, database searching and management; OPAC utilization	3.68	Moderate observed competency gap	Moderate alignment	Functional operational capability exists, but advanced retrieval optimization and database management competencies require strengthening.
Digital communication, virtual reference, and user engagement	Virtual reference tools; online user support; digital user communication	3.52	Substantial observed competency gap	Moderate alignment	Operational digital communication and remote user support capacity are established, although consistency in advanced user engagement practices remains uneven.
Digital content management	Digital content management; repository support; digital content organization	3.36	Substantial observed competency gap	Weak alignment	Advanced digital curation, repository coordination, and digital asset management capabilities remain underdeveloped relative to operational requirements.
Digital preservation and archiving	Digital preservation; digital archiving; preservation support systems	2.88	Moderate observed gap	Developmental alignment	Transitional preservation capability exists, but institutional depth in long-term digital stewardship and preservation practices remains limited.
Data analysis and visualization	Data analysis; digital reporting; analytical system utilization	2.64	Substantial observed gap	Critical misalignment	Advanced analytical competencies required for evidence-based digital decision-making and strategic digital service planning are

Adaptive digital service delivery and technology utilization	Mobile and online resource access; remote service support; adaptive platform utilization	3.84	Minimal to moderate competency gap	Strong to moderate alignment	insufficiently developed. KNLS demonstrates relatively functional adaptive digital service capability, although dependence on institutional technical support remains evident in specialized functions.
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Source: Research data

The alignment analysis indicates that KNLS's institutional digital skills have a unique profile. The findings reveal that there is significant misalignment in advanced digital transformation competencies, moderate or transitional alignment in intermediate digital service domains, and relatively strong alignment in fundamental digital literacy and operational ICT competencies. When taken as a whole, the results place KNLS at an intermediate level of institutional digital maturity, marked by established foundational operational digital capability, operational digitally mediated service delivery systems, and uneven development of advanced digital transformation competencies.

6. DISCUSSION

Foundational Competencies Are Institutionalised; Advanced Competencies Are Not

The findings reveal a multifaceted, organized pattern of competency alignment in KNLS's digital information service ecosystem. Overall, the results show that there are still significant developmental gaps in advanced digital transformation domains even if the institution's basic operational digital competences are comparatively well established. The findings indicate a high correlation between the contextualized skill requirements defined for normal delivery of digital information services and the core operational digital competencies. Digital literacy, information retrieval, database access, fundamental ICT operations, and everyday usage of digital systems all had relatively greater self-reported proficiency levels and lower competency gaps. These findings imply that KNLS has effectively institutionalized the baseline digital operational skills required to enable essential digitally mediated library services, such as routine digital user assistance, electronic resource access, OPAC use, and online reference support.

The findings also indicate that advanced technical competencies are less uniformly distributed throughout staff categories than fundamental digital competencies. A comparatively wide institutional exposure to standard digital service systems and operational technology is suggested by lower variability in digital literacy and operational ICT functions. This pattern supports previous research that showed KNLS's fundamental digital systems were widely used. When taken as a whole, the findings point to the relative normalization of foundational digital integration in regular institutional processes. Information professionals in digitally changing library contexts

frequently exhibit greater competences in normal operational digital services than in advanced digital transformation functions, according to Raju's (2014) assessment. Similar results were also documented by Mthembu (2019), who discovered that because regular digital systems eventually become integrated into everyday institutional procedures, staff members in public and university libraries often acquire core ICT competencies more quickly. Similar findings were reported by Rutto et al. (2025), who discovered that while Kenyan university library employees have a basic understanding of ICT, they nevertheless need to continuously improve their skills in order to stay relevant in a fast digitizing environment.

Significant competency gaps in advanced digital competency domains—specifically, digital content management, digital preservation and archiving, and data analysis and visualization—are revealed by the investigation. Weak alignment between current staff competencies and the contextualized competency needs for advanced digital information service delivery was evident in these domains, which consistently displayed lower self-reported proficiency levels and statistically significant competency gaps. The results show that as digital service needs move from regular operational ICT operations to higher-order analytical, curatorial, and technologically integrative capabilities, competency deficits become more noticeable. According to the results, KNLS presently exhibits greater operational digital readiness than advanced digital transformation capacity. This pattern is indicative of an institutional environment that is digitally developing, where the development of related sophisticated human resource capabilities has lagged behind the expansion of technological systems and operational digital services. Similar disparities have been documented by Asiri and Finlay (2025), who noted that while workforce competencies in advanced digital analytics, digital preservation, and strategic digital content management remain relatively underdeveloped, many library and information institutions undergoing digital transformation show significant growth in digital infrastructure. Hoque (2023) made similar conclusions, pointing out that workforce readiness in higher-order digital competency domains that call for specialized technical expertise and ongoing adaptation is often uneven in digitally evolving information environments.

Competency Gaps Reflect Institutional, Not Individual, Deficiencies

These competency gaps are a reflection of larger institutional capability trends linked to changing digital service environments rather than discrete individual weaknesses. The results show that competency gaps are concentrated in areas where KNLS's institutional support mechanisms may be impeding development - domains that call for specialized training, ongoing professional development, and institutional investment. In a similar vein, Ubaga's (2025) research of Kenyan university librarians discovered that although staff members were highly proficient in basic and intermediate ICT skills, advanced ICT skills remained mediocre. The main obstacles to skill growth were found to be inadequate funding and technical obsolescence.

The results demonstrate the fundamental differences in competency gaps across organizational levels within KNLS. Advanced digital competences were distributed unevenly within the organization, according to a comparison of competency patterns among department heads, executive-level employees, and operational librarians. The results imply that possibilities for professional growth, technical specialization, exposure to cutting-edge digital systems, and strategic digital functions may not be evenly dispersed across institutional levels. The observed variation across staff categories further suggests that competency gaps are organizationally patterned capability differences shaped by role differentiation, operational responsibilities, and unequal access to advanced digital experiences rather than haphazard institutional deficiencies. The results imply that the varying competency requirements of different operational and management positions within digitally evolving library environments may not be sufficiently addressed by generalized institutional training techniques. These findings are consistent with observations made by Vuorikari et al. (2022), who contend that because institutional structures differ in terms of technological exposure, operational responsibilities, and access to professional development opportunities, digital competency development within organizations is frequently uneven. Similar findings were observed by Lawrence and Francis (2026), who discovered that advanced digital abilities frequently cluster inside particular institutional categories in charge of digital systems management and strategic technical functions.

Theoretical and Practical Implications

The findings offer empirical evidence that the CILIP Professional Knowledge and Skills Base (PKSB) framework can be used in digitally transforming public library settings. The PKSB domains pertaining to IT and Communication, Literacies and Learning, Knowledge and Information Organization, Information Governance, and Using and Exploiting Information strongly correspond with the competency areas found in the findings. The PKSB's function as a benchmark framework for understanding competency criteria in technology-mediated library service environments is thus supported by the findings. The findings also highlight the significance of placing international competency frameworks in the context of operational contexts, service realities, and organizational structures unique to individual institutions. The contextualized competency domains created in this study show that, although PKSB offers a useful professional benchmark, KNLS's unique digital service environment - which emphasizes OPAC services, electronic resource access, and virtual reference support - shapes the institution's specific competency requirements. This result supports the claim that competency needs in digital library systems are context-dependent and cannot be understood apart from operational service demands and institutional technology realities.

The findings have important practical ramifications for KNLS's development of human resource capabilities. Targeted training interventions are urgently needed in advanced digital domains, including data analysis and visualization, digital preservation, and digital content management, where there are significant competency gaps. The correlation between self-reported competency levels and perceived importance indicates that staff members are aware of the increasing significance of these advanced competencies, but they are not yet proficient in them. One-size-

fits-all training methods are unlikely to be effective due to the role-differentiated nature of skill gaps. Rather, the results validate the necessity of role-aligned competency development programs that cater to the unique needs of operational librarians, department heads, and executive leaders. Librarians may need specialized training in data analytics, digital preservation, and digital content management because they have the most skill gaps in advanced technical fields. While corporate executives might need assistance with strategic digital planning and digital governance, department heads might benefit from training that connects strategic and operational digital competencies. The findings also emphasize how crucial institutional support systems are for fostering competency growth. It appears that digital service delivery at KNLS currently functions within a collaborative institutional support environment rather than through fully autonomous technical capacity across all staff levels due to the reliance on collaborative technical support mechanisms, such as ICT personnel, peers, and supervisors. Practically speaking, improving institutional support systems - such as opportunities for ongoing professional development, access to technical expertise, and collaborative learning environments - might be just as crucial as developing individual competencies.

7. CONTRIBUTION

This study contributes to the body of literature in a number of ways. It offers evidence-based insights into the particular competency requirements and gaps within a Kenyan public library system, making it the first contextualized competency benchmarking study for the Kenya National Library Service. The findings address a gap in the body of knowledge regarding the ability of human resources to provide digital information services in African public library settings.

In theory, the study shows how the CILIP Professional Knowledge and Skills Base (PKSB) framework can be used in digitally transforming public library settings. While demonstrating the significance of contextualizing international professional standards for particular institutional and national contexts, the congruence between PKSB competency domains and the contextualized competency requirements defined at KNLS validates the framework's applicability. By highlighting the influence of position differentiation, institutional support systems, and access to professional development on workforce capability, the study also advances the understanding of competency gaps as institutionally designed rather than individually driven.

Practically speaking, the study gives KNLS management empirical data on training priorities, staff competency gaps and strengths, and the varying competency requirements among staff types. These results can help with competency assessment systems, role-aligned professional training, and evidence-based staff development planning.

Conclusion

In addition to technology infrastructure, a workforce equipped with the skills necessary to properly utilize these systems is also necessary for public libraries to undergo sustainable digital transformation. Although KNLS has accomplished basic digital operational integration, this study shows that there are still significant developmental disparities in advanced digital transformation competencies. Coordinated institutional initiatives that match competency development with operational service demands, role-specific responsibilities, and changing professional expectations are necessary to address these gaps.

The findings offer a foundation of evidence for focused interventions that can improve the delivery of digital information services and bolster human resource capability at KNLS and similar public library organizations.

Recommendations

The following suggestions are offered in light of the study findings:

1. Implement focused capacity building initiatives in the priority areas, particularly data analysis and visualization, digital content management, and digital preservation, that have been found to have the biggest capability gaps. In keeping with staff learning preferences, training strategies should prioritize experiential workshops, modular online learning, and peer mentorship.
2. Develop competency development pathways that are role-aligned and address the unique needs of operational librarians, department heads, and executive leaders. Access to specialized technical training should be prioritized for librarians, who have the most advanced proficiency gaps.
3. As demands for digital services change, provide systems for ongoing competency assessment to track staff skill development and spot new competency gaps. Planning and resource allocation for institutional training should be guided by regular competency audits.
4. Strengthen institutional support systems for the development of digital competencies, such as systems for collaborative knowledge exchange, protected learning time, and access to technical experts. The dependence on collaborative technical support mechanisms implies that institutional support systems are just as crucial as the development of individual competencies.
5. To ensure sustained investment in workforce skills enhancement, incorporate digital competency development into institutional planning and budgeting frameworks. A certain portion of ICT-related funds have to be set aside for ongoing professional development and the advancement of digital competencies.

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