The Transformation of Libraries in the Digital Age: Redefining Access, Learning, and Cultural Heritage Preservation

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ABSTRACT

Background: Digital technologies have been rapidly integrated, which changes the organizational system of libraries and turns them from libraries as a traditional repository of information to dynamic digital learning and cultural preservation centers. This paper examines the role of digital tools in service delivery, user experience, preservation of heritage and future strategic directions in the libraries setting.

Objectives: The study sought to analyze the perception of digital access and service transformation by library professionals, the extent to which digital tools support learning, explore digital solutions to cultural preservation, the challenges to digital adoption and the future of digital library development.

Methodology: The quantitative research design was utilized based on a structured questionnaire that was used to sample 215 library professionals who were chosen by means of purposive sampling. The data were gathered through an online questionnaire and analyzed based on descriptive statistics and the findings were in table form, frequencies, and percentage distributions in thematic areas. Ethics were upheld so that there would be confidentiality and voluntary involvement.

Key Findings: Findings have shown a high level of agreement that digital technologies can improve access, outcomes of services, and serve distant users. Respondents admitted that digital tools have a beneficial impact on the learning experience, research productivity, and user engagement. Digitization was widely considered an important approach to the preservation of cultural heritage, which provided ways to address physical decay and make it accessible to everyone worldwide. Nonetheless, they still face a set of obstacles, such as the lack of funds, technical constraints, digital illiteracy, and employee training requirements, security issues, and organizational change opposition. Irrespective of these obstacles, the respondents reported that they are optimistic about the future, as they thought that there will be more digital investments, more artificial intelligence integration, more collaboration networks, and sustained expansion in the use of digital resources.

Conclusion: The article confirms the reality that the digital transformation is changing the core roles of libraries and making them more influential to the society. Whereas this is a major stride towards the right

direction, sustainable digital development requires that sustained investment, capacity development, support of policies and technological advancement are provided. Addressing the existing challenges will assist libraries in improving digital services and becoming future-proof.

Recommendations: The study suggests the enhancement of the funding allocation on digital infrastructure, sustained degree of professional education, encouragement of user digital literacy, establishment of policies on preservation, and elaboration of inter-institutional cooperation. The active introduction of new technologies, service models that are user-friendly will ensure that libraries will also become dynamic, innovative, and knowledge centers that people throughout the world will be able to use.

Keywords: Digital Libraries, User Engagement, Cultural Preservation, Digital Transformation, Library Services, Future Prospects, Challenges, Information Access

INTRODUCTION

The advent of digital technologies has greatly altered the modern library landscape and has brought about a radical change in access, management, delivery and preservation of information (Gorman, 2006). Libraries that were previously thought of as a place to store printed works have evolved to be dynamic digital knowledge hubs that are capable of adapting to the ever-changing needs of the twenty-first-century users (Rahmanova, 2025). The change in the old models of libraries to the digital-oriented ones is not only technological but also a redefinition of the basic purpose of a library to provide access, lifelong learning, and to preserve cultural heritage to the succeeding generations (Onunka et al., 2023). With the growing dependence of the communities on online platforms, libraries have been forced to reorganize their services, resources, and professional facilities to be relevant in responding to the needs of the users (Given and McTavish, 2010).

The age of digital has brought with it a lot of opportunities in the form of extending access to information. Time, place, and physical restrictions that once influenced access to reference services have been overcome by online databases, e-books, digital archives, remote access, and virtual reference services (Meesad and Mingkhwan, 2024). In the new scenery, customers demand immediate access, user-friendly interfaces, and flow of connectivity with various information sources (Lee, 2024). In the case of library professionals, these expectations imply the need to learn more about digital tools, user behavior, and information technologies (Ajani et al., 2023). As a result, libraries are turning more and more towards building powerful digital infrastructures, improving digital literacy among patrons, and investing in employee training to be able to work in technologically abundant settings efficiently (Ullah et al., 2023).

Digital transformation has had a significant effect on learning and user engagement, in addition to the improved access. By means of incorporation of digital learning platforms, multimedia, virtual tutorials, and interactive online services, libraries have become active partners both in academic and lifelong learning settings (Adigun et al., 2024). With the transition of the higher education institutions to blended and online learning models, libraries are critical to facilitating pedagogical change and developing digital learning ecosystems (Bello and Adepegba, 2023). The services of social media, virtual outreach and online user communities also increase the visibility of the library and its identity as a provider of formal and informal learning.

Digitisation and digital preservation of cultural heritage is another important aspect of this change. Libraries possess many centuries of intellectual, historical, and cultural resources which have to be maintained in order to be used in the academic field and cultural continuity (Chen & Zou, 2025). The digital preservation provides solutions to the problems related to the physical decay, restricted accessibility, and geographical limitations. Digitization of cultural heritage means that it is universally accessible, allowing scholars, researchers, and communities all over the world to interact with hitherto

restricted or delicate objects (Cscont, 2025). Nonetheless, successful digital preservation needs strategic management, metadata standards, technological and lasting funds. These complications present libraries and their professional staff with more and more challenges to preserve, protect, and market digital collections in manners that guarantee their sustainability and integrity.

Although digital transformation has its advantages, there are a number of challenges to libraries. Most institutions are struggling with the lack of funds, poor infrastructure, insufficient employee training, and unequally distributed digital literacy among users (Neglia et al., 2024). The problem of digital security, confidentiality, and data management regulation also makes digital service implementation even more challenging. Furthermore, libraries are not always able to change, since change is usually met with resistance, organizational factors, and the rate at which technology changes (Nappi et al., 2024). These challenges are only handled by strategic planning, capacity building that is continuous and cooperation among institutions.

With these complexities arising as libraries negotiate them, there is growing interest in how digital transformation is perceived and applied by library professionals. They are backed with their experiences, competencies, and views which are the basis of effective digital initiatives (Giannini and Bowen, 2019). Their opinions must be examined to determine the efficiency of the existing digital services, problems or issues faced, and also devise informed strategies that would help in future enhancement (Afzal and Naseer, 2007). These insights could be used to make the digital policies of the institutions appropriate to the needs of the users, professional competencies, and long-term visions of the library development.

The current research paper addresses the digital age change in libraries, focusing on how library practitioners understand the development of the libraries scenarios in terms of access, learning support, cultural heritage preservation, and perspectives of the future. Examining the benefits and the drawbacks of the digital transformation, the study promotes the improvement of the current picture of the library role in the modern society. By performing an in-depth examination of the experiences of library professionals, the study will endeavor to bring out key areas of concern in terms of capacity building, policy improvement, and strategic growth to make sure that the libraries remain dynamic, inclusive, and technologically enhanced platforms of information, learning and culture.

LITERATURE REVIEW

Digital Transformation of Libraries

The issue of digital transformation has become one of the trends in the development of libraries of all sizes across the globe. Libraries are also moving towards digital technology to enhance better service delivery, facilitate operations and increase access to resources (Ashiq et al., 2022). The given change is a part of a larger social change to digital communication, online education, and remote interaction. Libraries have become widely known for their large digital collections, online catalogues, online reference, and automated lending systems (Baryshev et al., 2020). Such developments assist libraries to meet the ever increasing demand of users who have increased responsiveness to fast, convenient, and technology enhanced access to information. The automation of the digital platforms also boosts operational efficiency through less manualization and retrieval of information is also faster.

Digital Access and User Services

The increase in access to information is one of the greatest consequences of the digital era on libraries. Digital technologies enable libraries to supply the users with materials wherever and whenever they need them. Online databases, digital journals, e-books, and other virtual research tools have become the indispensable elements of the library services nowadays (Ullah et al., 2024). These online materials eliminate the geographical limitation and enhance both educational and career processes of users more

easily. The libraries have also come up with easy to use interfaces and search systems through which they can navigate easily within the digital collections (Islam et al., 2025). But still, the problem of technological shortcomings, the inadequacy of infrastructure, and the differing degrees of digital literacy remain a problem to the successful utilization of digital resources.

Digital Learning and User Engagement

The libraries, as well, have been turned into digital learning platforms which enable both structured and informal learning. Libraries have become the core of digital learning communities because of the incorporation of digital learning tools, multimedia content, and interactive platforms (Afshar and Shah, 2025). Most libraries currently are providing online tutorials, online literacy courses, and online research support that enrich the learning experience of the users (Shahinuzzaman et al., 2019). The emergence of online and blended learning frameworks has also made the library stronger in assisting at the academic level (Shiva et al., 2025). Social media communication, virtual event, and online community building are engagement strategies that are increasingly employed to access different audiences. Such digital engagement practices enable libraries to reach their users across geographic borders and enhance their visibility.

Cultural Heritage Preservation in the Digital Era

Preservation of cultural heritage remains a fundamental responsibility of libraries. Digitizing has emerged as a prominent tool of preservation and marketing of historical and cultural collections (Khan, 2023). Digital preservation will help ensure the physical destruction of rare manuscripts, photos, archival records, and cultural objects as well as make such materials available to more people. Digital collections assist in research, continuity, and enrichment of education (Taylor et al., 2018). Nevertheless, digital preservation is also a resource-consuming process that involves expert knowledge on metadata generation, file format, storage systems, and preservation policies (Liu, 2022). Lack of financial support, the lack of technical infrastructure, and potential staff training present a challenge to many libraries, as they prevent them from implementing sustainable digital preservation programs (Afshar and Shah, 2025).

Challenges of Digital Transition

Even though digital transformation is advantageous, there are a number of challenges that libraries are experiencing that make it difficult to make the transition. The main obstacle is funding, especially in developing areas, where digital infrastructure might be insufficient (Singh, 2018). Technical problems like poor net connection, obsolete hardware and absence of integrated systems are some of the problems that do not facilitate efficient service delivery. It further means that most of the library workers need continuous training in acquiring the competencies that will help them use digital tools and work with online services (Kari, 2020). There are other complexities due to organizational resistance to change, issues related to data security, and high rate of technological innovation. These issues need strategic planning, institutional reinforcement and lifelong learning to tackle them.

Future Directions for Libraries

The future of libraries is strongly associated with the development of digital technologies. Artificial intelligence, machine learning, big data analytics, and digital curation tools are the new technologies that are likely to change the work of libraries even more (Cox et al., 2019). There is a growing interest among libraries in finding smart systems to discover resources, automatically catalogue, provide personalised recommendations and virtual assistance (King, 2020). Partnership between libraries, learning institutions, cultural organizations, and technology providers will be very instrumental in creating digital ecosystems (Wani and Londhe, 2023). With the ever increasing digital expectations among users, libraries will have to embrace the future oriented approaches that focus on flexibility, innovation and sustainability. The

further investment in the technological infrastructure, digital preservation, and personnel development will be critical in ensuring future flexibility.

Problem Statement

Libraries all over the world are experiencing a tremendous change due to the rapid changes in technology. Digital technologies are highly promising to improve access, learning, and cultural preservation but most libraries experience difficulties in adopting and maintaining the newly implemented innovations. Financial constraints, poor infrastructure, lack of appropriate staff training and different degrees of user preparedness are some of the issues that impede meaningful digital adoption. Having no clear picture of how library professionals understand these changes, the institutions run the risk of creating digital plans that will not yield user needs or allow the institution to develop in the long run. It is of paramount importance to measure the views of library professionals to determine the gaps, strengths and strategic priorities. This paper fills this gap by analyzing their experiences with digital access, learning support, cultural preservation, and future digital directions.

Research Questions

1. What is the perception of library professionals regarding the influence of digital technologies to access library resources and services?

2. What is the impact of the digital transformation on learning support and user interaction in libraries?

3. How do library professionals view the digital preservation of the cultural heritage?

4. What are the difficulties that libraries encounter when embracing and using digital technologies?

5. What are the future trends of library professionals in the direction of digital transformation in libraries?

Research Objectives

1. To investigate how library professionals perceive the process of digital access and service transformation.

2. To assess how digital tools can support learning and involvement of users in libraries.

3. To examine the professional opinions regarding the position of digitization in preserving cultural heritage.

4. To determine major issues that slow down the process of digital transformation in libraries.

5. To evaluate the future outlook and way forward of libraries in the digital era.

METHODOLOGY

Research Design

The research design adopted in this study was quantitative research design to understand how library professionals perceived the digital transformation in libraries. A survey approach was chosen because it enables an organized way of collecting data of a large sample and statistical interpretation of attitudes, experiences, and challenges. This design was suitable because it allowed the measurement of trends in the

areas of digital access, learning support, preservation of cultural heritage, challenges, and future directions in the library environments.

Population and Sampling

The study population was the library professionals in academic, public, and special libraries. The number of respondents who were involved in the study was 215. The sampling method was purposive such that no individuals who had no professional exposure to the services of digital libraries were included. This was an appropriate sampling technique as it made it possible to select the participants who were aware of the way libraries worked and practiced digital practices, which increased the usefulness and credibility of the results.

Data Collection Instrument

Data were collected using a structured questionnaire developed according to the research objectives and review of related literature. The questionnaire included both demographic items and domain-specific statements categorized into five thematic areas:

- Demographic Characteristics
- Digital Access and Service Transformation
- Digital Learning and User Engagement
- Cultural Heritage Preservation in the Digital Era
- Challenges and Future Prospects of Digital Libraries

Respondents rated statements using a five-point Likert scale (Strongly Disagree to Strongly Agree). The instrument was administered electronically to facilitate wider participation, reduce time constraints, and ensure convenience for geographically diverse respondents.

Validity and Reliability

The instrument had content validity because of the expert review by library science scholars. Before the actual survey, a pilot test was done to determine the clarity, structure, and the uniformity of responses. Feedback was used to implement the necessary changes. Internal consistency measurement was applied to determine reliability, so that scale items were reliable in getting responses.

Data Collection Procedure

The survey questionnaire was shared via email, institutional groups, and professional networks of library staff. The respondents were told the aim of the work and information anonymity. The involvement was voluntary and the consent was done electronically. Reminders were also sent to ensure maximum respondent rates were received within the data collection period.

Data Analysis

Data collected were coded, organized and analyzed using quantitative statistics means. Demographic data were summarized with the help of descriptive statistics (frequency and percentages) and general perceptions were deducted. The results were in tables, charts, and figures, which are easily interpretable and understandable. Findings were then considered with regard to literature to make relevant conclusions.

Ethical Considerations

The research was conducted in compliance with the principles of ethics, that is, anonymity, privacy, and respectful treatment of information. No personal details were gathered and data were utilized only to research purposes.

RESULTS & DISCUSSIONS

Results and Discussion section contains the most significant findings of the research and makes them clear in terms of the entire research. It begins by providing objective presentation of analyzed data in tabular, figuration, and statistically summarized data to show what this research discovered. These results are then well elaborated and justified with regard to its relation with the research questions and the literature. The part also does not simply state the patterns and trends but also evaluates their implications, compares them with other studies, and provides possible explanations to the findings. The combination of the results and discussion gives a clear understanding of what the data report communicates and how the research results can be utilized to contribute the knowledge that is already in place.

Demographic Profile of the Respondents

Table 1: Demographic Information (n = 215)

Category	Sub-category	Frequency	Percentage
Gender	Male	132	61.4%
	Female	78	36.3%
	Prefer not to say	5	2.3%
	Total	215	100%
Age Group	Below 25	18	8.4%
	25–34	72	33.5%
	35–44	68	31.6%
	45–54	40	18.6%
	55 and above	17	7.9%
	Total	215	100%
Highest Educational Qualification	Bachelor in LIS	52	24.2%
	Master in LIS	88	40.9%
	MPhil in LIS	48	22.3%
	PhD in LIS	15	7.0%
	Other	12	5.6%
	Total	215	100%
Current Job Position	Library Assistant	38	17.7%
	Librarian	90	41.9%
	Senior Librarian	46	21.4%
	Library Manager/Director	28	13.0%
	Other	13	6.0%
	Total	215	100%
Years of Professional Experience	Less than 1 year	20	9.3%
	1–5 years	58	27.0%
	6–10 years	70	32.6%
	11–15 years	40	18.6%

More than 15 years	27	12.6%
Total	215	100%

The culture of the 215 respondents is diverse and well experienced. The gender distribution indicates that the largest population (61.4%) are of the male gender, females make up 36.3% making the gender imbalance in the sampled population moderate. Very low percentage (2.3%) showed not to want to declare their gender, which indicates little non-response in this variable.

The age profile shows that the majority of respondents belong to the early and mid-career age group with the biggest numbers being 25-34 years (33.5% and 31.6%, respectively). The 45-54 age group constitutes 18.6 percent, with smaller numbers of less than 25 (8.4 %,) and older than 55 (7.9 %,). This trend indicates that the labour force is dominated by young and middle-aged professionals who are probably busy in technological and organizational change.

Regarding educational attainment, a high percentage of the population has advanced degrees in Library and Information Science (LIS). Most of them have Master (40.9%), MPhil (22.3) and the holders of Bachelor (24.2%) degrees. A lower percentage possess PhDs (7.0%) or other qualifications (5.6%). It reflects the existence of a well-qualified workforce on the whole, which has a good background to participate in areas of special library work and digital transformation projects.

In terms of job positions, the highest percentage of the respondents are Librarians (41.9%), then there is Senior Librarians (21.4%), and then Library Assistants (17.7%). The Library Managers or Directors are 13.0% and other 6.0% are occupied with other duties. This distribution portrays an acceptable hierarchy and even distribution at both operational and management levels.

The level of professional experience shows that the workforce can be mostly mid-career, with 32.6% being 6-10 years experience and 27.0% being 1-5 years. Moreover, 18.6% possess 11-15 years and 12.6% have over 15 years of experience, which is an indicator of a good level of knowledge in the institution and practical skills. The new entrants below one year of experience are only 9.3%.

On the whole, the demographic profile shows that the group of library professionals is professionally qualified, moderately experienced, and structurally diverse, which places them in a good position to contribute to and adapt to the changing digital and organizational contexts.

The findings show that there is a great positive perception of service transformation and digital access among the users and library professionals. In all items, most of the respondents answered Agree (A), and Strongly Agree (SA), which shows a wide acceptance of the value and usefulness of digital technologies in libraries. An example is that 70.7 percent (A+SA) responded that digital technologies have created a tremendous access to library materials whereas 69.3% agreed on that online databases and e-resources have created better quality in the services. This implies that the digital platforms are highly accepted as one of the key information delivery tools in the modern world.

Digital access also seems to affect user satisfaction in a positive manner, with 64.7% of people agreeing with the statement that the transition to the digital environments has led to a positive change in the user satisfaction. Nevertheless, a relatively small percentage of respondents showed that they were in the middle, which suggests that there are still some users who have not yet adapted to digital environments or who might need additional assistance. The same pattern is seen with the perception of the library to support remote and online users, 63.7% agree but a significant 19.1% neutral response indicates that the library can improve its infrastructural support of remote services.
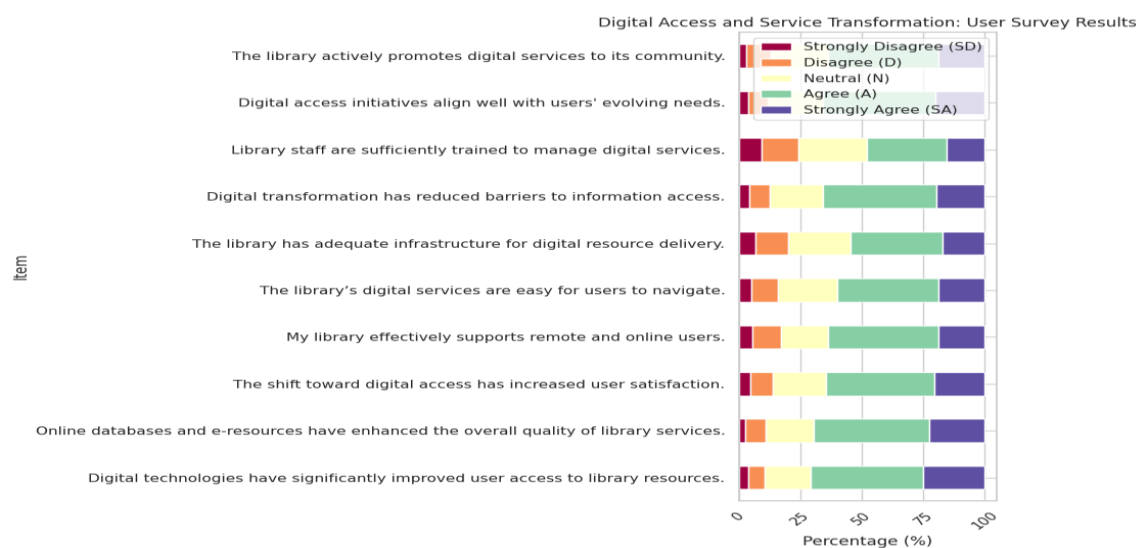
Figure No. 1 **Digital Access and Service Transformation**

The usefulness of digital services was highly rated and 60% of them support the claim that navigation is easy to follow, but rather neutral responses (24.2%) suggest that it needs more interface design and ease of access. Similarly, although 54.4% of the respondents concurred with the fact that the library has sufficient infrastructure, the comparatively high levels of disagreement (20%) and neutrality (25.6%) point to the possible gaps in technological capacities or resource allocations.

Digital transformation is considered to decrease obstacles to accessing information, which is backed by 65.5% agreement. Nonetheless, employee willingness is an issue of concern. Even though 47.9% admitted that the staff is trained enough, this item received the highest disagreement rates (24.2%), which means that the staff needs to be developed professionally in order to facilitate sustainable digital services.

Lastly, the consistency between digital initiatives and user needs (65.6% agreement) and the proactive marketing of digital services (63.7% agreement) show that libraries are more inclined to change in response to the changing digital demands. On the whole, the data indicate robust improvement in digital service improvement; however, it also shows areas that are critical (especially in staff training and infrastructural fortification), needed to be sustained to guarantee digital transformation.

The findings show that the perception of digital learning programs and user interaction in the library setting is always positive. The majority of the respondents indicated agreement and strong agreement to the items, which means that digital tools and services play a significant role in improving the learning process. Indicatively, 72.1% (A+SA) responded that digital tools have made the learning experience of users better, which is indicative of a great feeling of competence in the usefulness of technology-enhanced learning.

Digital literacy training was also positively rated, 60.5% people agreed. Nevertheless, there is a significant proportion of the number of respondents (25.6% neutral and 14% disagreeing) who indicate that training programs might be in need of more outreach, regularity, or personalization, as a way of satisfying user requirements to the full extent. The same trends are reflected in the attitude towards online learning platforms, with 66.5% of the respondents having a strong agreement, yet a large proportion of the neutral ones (19.5) represents different levels of user engagement or familiarity.
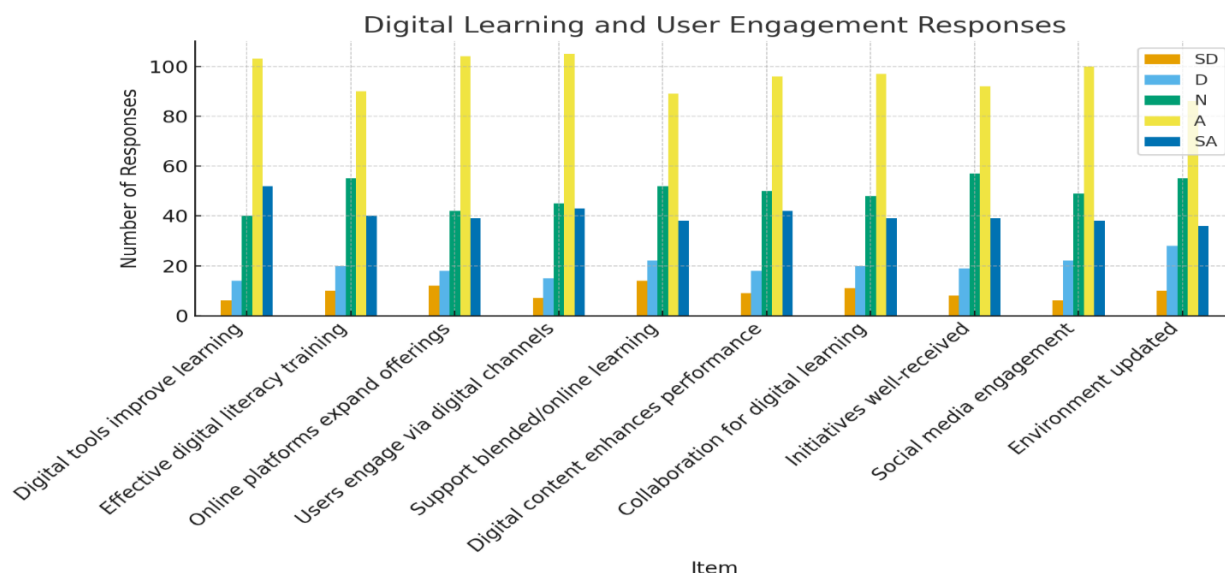
Figure No. 2 **Digital Learning and User Engagement**

Engagement of users via digital channels seems to be high, as 68.8% believe that the level is on the rise, which demonstrates the rising significance of digital communication and service delivery. The positivity in accepting blended and online learning environment has also been positive (59.1%), but the young proportion of moderate neutral responses (24.2%) shows that there is a possibility to reinforce the institutional strategies or infrastructure.

Digital content was well-known to boost research and academic performance with 64.2% of the respondents backing the idea. Faculty and institutional collaboration was highly appreciated too (63.2% agree) and indicates the growing role of the library in academic liaisons and support of the curriculum.

Digital learning initiatives have been shown to be satisfying to users, with 60.9% agreement, although the number of those who did not agree with it was almost a quarter, which can be used to enhance user-centric design and assessment processes. Social media has become an appropriate method of engagement, and 64.2% of respondents expressed their views, which is an indicator of the effectiveness of libraries to adapt to the modern trends of communication.

Lastly, the digital learning environment is seen to be constantly enhanced with 56.7% assent. Nonetheless, a comparatively larger degree of contention (17.7%) indicates that there is still a problem with keeping up with the technological changes or the availability of resources.

In general, the data reveal that there has been significant advances in digital education and user interactions, which is backed by high user acceptance and growing digital use. However, the digital literacy training, support of blended learning, and constant enhancement of the platform can be also viewed as the prospective areas of development.

The findings demonstrate the overabundant positive attitude to the future role of digital technologies in library services. A major percentage (77.2%) is in agreement or strongly in agreement that digital libraries will become the center of information service in the future implying that there is high belief that the digital platforms will continue developing to be the essential part of the library operations. On the same

note, 69.3% confirmed their assurance of a future growth in investment of digital tools, a sign of a long-term continuity of growth in technology and financial investment prospects in the next few years.

The digital innovation preparedness index is moderately high, and 58.6% of those surveyed stated that their libraries were prepared to embrace emerging technologies. This is an indication that although there has been some improvement, there is a possibility that there are institutions that will still need more encouragement to adopt the next generation digital systems. The acquisition of digital skills by library staff is also a high-priority area as projected 65.5% of those felt that more emphasis will be given to skills development in line with the needs of the more technology-oriented workflows.

Artificial Intelligence (AI) is also regarded as a disruptive one, and 63.2% are expecting that it will have a huge impact on future library services. This reveals an increasing realization of the benefits of AI to improve information search, automated repetitive work, and facilitate individualized user experiences. Similarly, digital platforms should enhance cooperation within libraries, which was verified by 69.3% of the participants, which highlights the significance of networked environments and common digital infrastructure.

There is long-term institutional commitment to digital transformation with 59.1% stating that their libraries possess strategic focus to the digital progress. There will also be a change in the behavior of the user, with 59.5% of the respondents being correct that there is a growing trend of the user becoming more inclined to use digital resources as opposed to physical resources, a phenomenon that is caused by the convenience and availability.

The idea of digital preservation has become an urgent future task, and 64.7% are in agreement that libraries should focus on long-term protection of digital materials. Lastly, technological adaptation is regarded as a key to survival of the institution as 58.6% of them stated that the future of libraries lies in their ability to keep with the rapid change in technology.

In general, the research findings indicate a progressive trend where libraries are looking at an increased digital role, more profound adoption of sophisticated technology like AI, more vigorous partnerships, and becoming increasingly dependent on digital solutions. Nevertheless, the evidence also puts in place the increased preparedness, continuous skill acquisition and longer strategic investment to make sure that the libraries continue to be adaptive, innovative and responsive to future information environments.
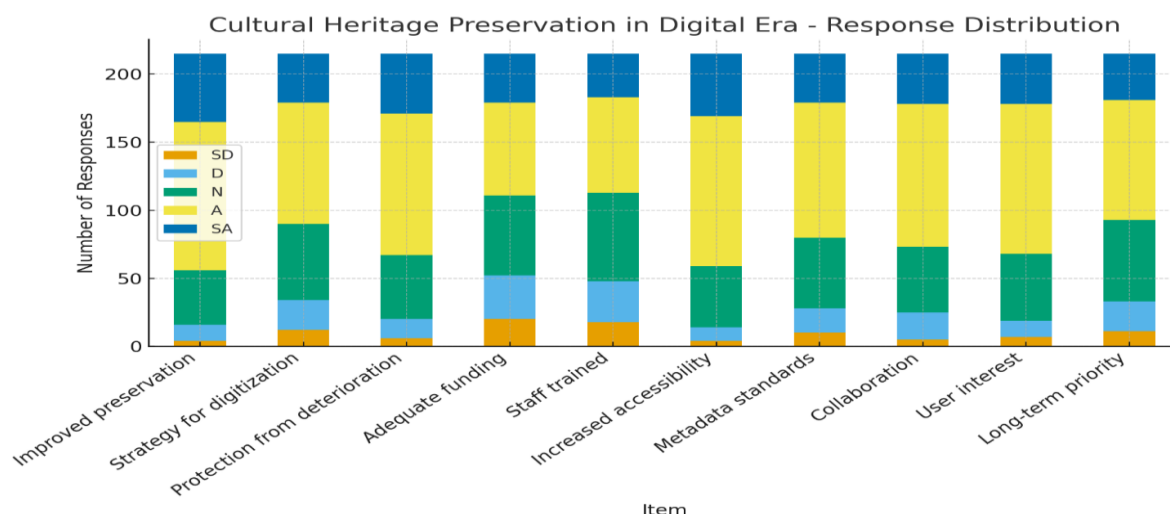

Figure No. 3 **Cultural Heritage Preservation in Digital Era**

The results show that the general agreement between the respondents on the topic of the positive effects of digitization on cultural heritage preservation is strong. Embracing digitization as a means to preserve cultural heritage materials received substantial majority (74% agreement and strong agreement) as people are clearly aware of the importance of digitization in preserving delicate collections. On the same note, 69% affirmed that digital preservation is effective in ensuring material does not degrade physically and thus they are assured that digital strategies can be used as a source of long-term maintenance of resources.

Institutional planning is also found to be moderately helpful to digital preservation. More than half of the respondents (58%) reported that their libraries already have well-defined digitization strategies in place (regarding rare or special collections), which implies that they are undertaking organized heritage preservation. The reaction on the issue of funding however, indicates a more divided opinion. Although 48 percent answered in the affirmative on whether sufficient funding is provided, a significant proportion of 24 percent answered negatively showing that financial constraint is still a problem in certain environments.

Another area that needs to be improved is training and professional capacity. Though 47% of the respondents responded that library professionals receive training on digital preservation methods, 22% responded in the negative stating that there is an unequal distribution of professional development opportunities among institutions.

One of the biggest strengths of digitization endeavors is global accessibility. Over three-quarters of the respondents (72%) admitted that digitization of heritage materials greatly contributes to global access, which emphasizes the importance of digital projects in helping to increase the cultural horizons beyond the local scope. This is backed up by 63% of those who said that their libraries have met their metadata standards, which is critical in their discoverability and long-term accessibility.

Partnering with other institutions is also highly supported as 66% of the respondents concurred that collaborating with other institutions improves digital preservation practices. The engagement of users also looks promising because 68% noted that they had a strong interest in accessing digitized heritage collections which is evidence of a definite interest in digital cultural content.

Lastly, 57% of respondents confirmed digital preservation is part of long-term planning in their library, although close to a quarter of respondents responded with a neutral, indicating that over time it is making strides, but it does not necessarily mean institutions prioritize it.

On the whole, the data indicate an overall positive situation in the field of digital cultural heritage preservation with its substantial awareness of the advantages, growing strategic orientation, and the growing interest of users. Nevertheless, the issues of unstable funding and unequal education of staff remain and deserve specific focus to enhance digital preservation even further.

The findings indicate a number of significant barriers to digital transformation in library settings. The problem of funding takes the first place in this list: the majority (66.5%) of the participants state that the lack of funding limits the use of digital programs. This implies that even with the increasing institutional consciousness, budget constraints still have a negative impact on holistic digital development.

Another major challenge is human resource preparedness. The lack of enough training among the staff was rated as the significant hindrance by a collective of 59.6% respondents, which means that there is a hole in professional capacity to facilitate digital functions. Digital service delivery is also complicated by technical challenges with 61.4% agreeing that the smooth operation of the system is hindered by technical problems. All these findings are a sign of what should be done to achieve long-term investments in training and technological infrastructure.
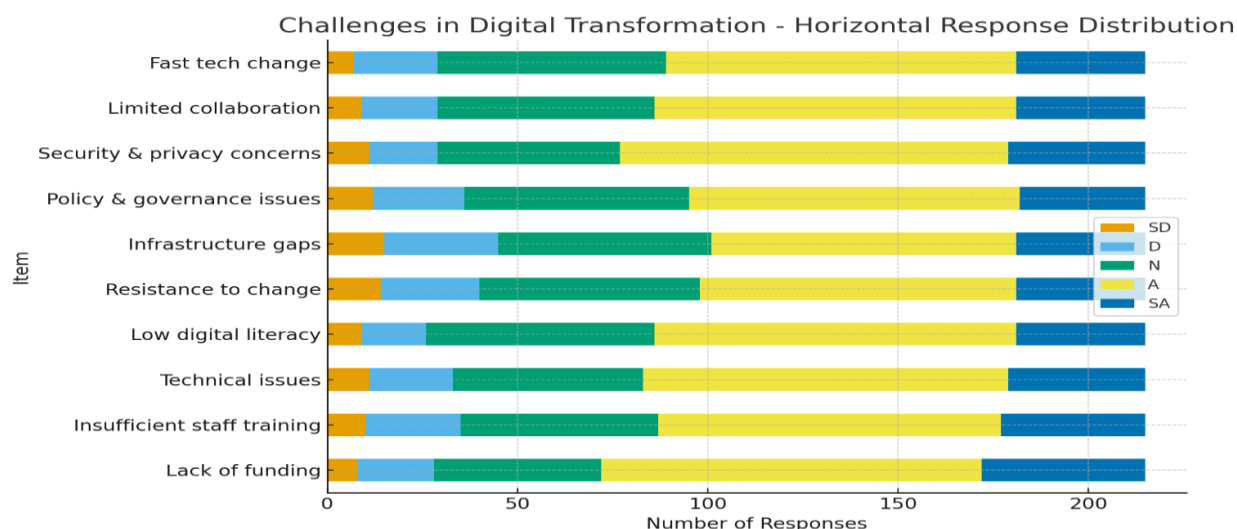
Figure No. 4 **Challenges in Digital Transformation**

The constraints that are experienced by the users are also important with 60% of those surveyed indicating that low digital literacy among the users inhibits the overall effectiveness of the digital initiatives. Also, the organizational culture seems to have an impact on the rate of change; 54.4% of people admitted that the opposition to change has an impact on digital transformation efforts, which implies that the process of institutional adjustment is a persistent issue.

Another significant challenge is the lack of infrastructure. More than 53% of the respondents (n=53) confirmed that infrastructural divides are a barrier to the digital technology uptake, they stated that new hardware is required, reliable connectivity, and scalable digital systems. Similar troubles were attached to policy and governance in that, 55.8% revealed that structural and administrative difficulties are creating a problem to the progress of digital library services.

Security and privacy factors also proved to be powerful factors as 64.1% of the participants concurred that such factors make the digital expansion of services complicated. This highlights the need of developing effective cybersecurity and guidelines to guarantee user trust and system integrity.

There does not seem to be collaboration either, with 60% of people reporting to agree that ineffective inter-institutional collaboration diminishes the effectiveness of digital initiatives. Lastly, the high rate of technological change is a continuous problem to most institutions with 58.68% experiencing the challenge of keeping up with the continuous innovations.

Taken together, the evidence shows that the terrain is rather complex, with financial limitations, workforce preparedness, technological constraints, user capabilities, organizational culture, and governance concerns coming to play to define the difficulties of digital transformation. To overcome these hurdles, there is a need to take a holistic and strategic approach in terms of funding prioritization, long term staff training, infrastructural modernization, reforms, and strategic partnerships.
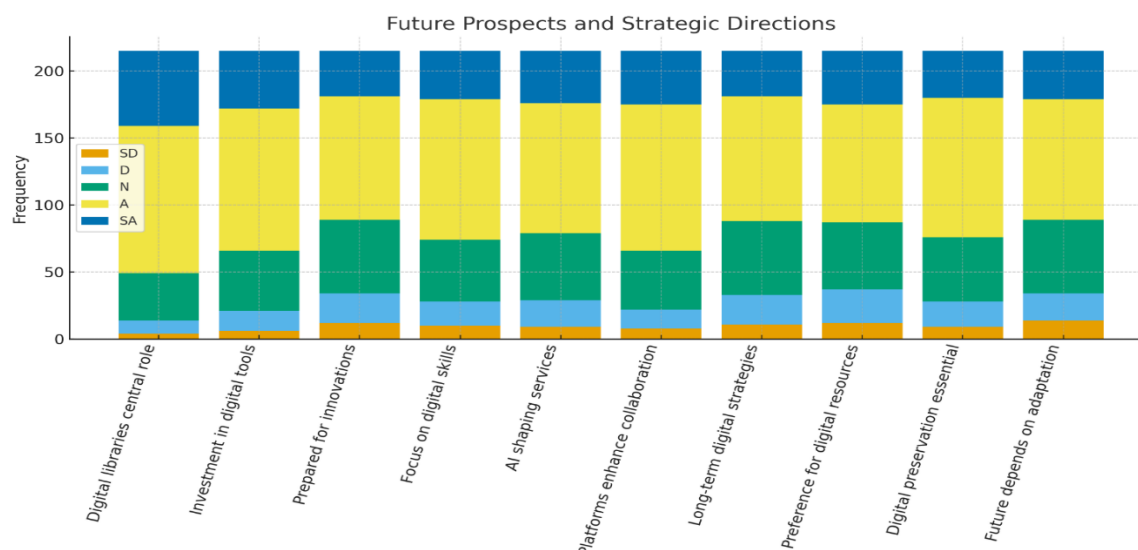
Figure No. 5 **Future Prospects and Strategic Directions**

The findings suggest that there is a strong majority of positive expectations about the future role of digital technologies in library services. 77.2% of the respondents replied that they agreed or strongly agreed that they believed digital libraries will be at the center of future information services and this indicates that they have a high level of confidence that digital platforms will continue to develop as a fundamental part of the library operation. On the same note, 69.3% confirmed that investment in digital tools will keep rising as another indication of future technological development and financial investment in the next years.

Digital innovation preparedness is average with 58.6% of the respondents reporting that their libraries are ready to embrace new technologies. This indicates that even though the progress has been made, it is possible that some of the institutions need more assistance to adopt the next-generation digital systems to a full extent. Building digital skills in library professionals is also a high-profile future agenda since 65.5% of the respondents acknowledged that more effort will be directed at skill improvements in line with the needs of more workflows that are technologically oriented.

Artificial Intelligence (AI) is also perceived as a disruptive phenomenon, so 63.2% perceive that it will have a great impact in future library services. It sheds light on the increasing interest in AI as something capable of improving information retrieval and automating routine activities as well as helping users have personalized experiences. Similarly, digital platforms are likely to enhance cooperation between libraries, which is believed by 69.3% of respondents, which is why the networks of environment and mutual digital structures are significant.

There is also a long-term institutional investment in digital change, where 59.1% of the respondents recognize that their libraries are strategically focused on digital change. It is also likely that the behavior of the users will be affected, with 59.5% indicating that more users will be willing to use physical resources as opposed to using digital resources since they are convenient and easily accessible.

The importance of digital preservation is considered as an urgent future task with 64.7% of them accepting that libraries should focus on the long-term preservation of digital resources. Lastly, one of the key factors that institutional survival is believed to be due to technological change as 58.6% believed that the future of the library was in the ability to keep up with the swift technological transformation.

Comprehensively, the results indicate a progressive trend in which libraries expect to grow in digital capacity, more profound incorporation of cutting-edge technologies like AI, more collaborative efforts, and the growing use of digital solutions. The data however indicate that there should be increased preparedness, continual skill enhancement and a sustained strategic dedication to bring about the idea of libraries being flexible, innovative and responsive in the future information environment.

DISCUSSION

Findings of this study affirm that digital transformation has significantly contributed to changing library services which is more or less in line with the literature already available on the topic of interest, which centers on the gradual shift in the traditional manner of library operations to the digitalized settings. The respondents were in a high agreement of the greater ease of access and service delivery on the digital platform, which indicates that the digital platforms have enhanced ease of use, discovery of resources, and accessing information. This confirms previous theses that digital technologies eliminate geographical and time boundaries, allowing library resources to be accessed remotely (Meesad and Mingkhwan, 2024). The high-rated positive value of the digital access is also in line with Rahmanova (2025) who stipulates that libraries are changing to dynamic digital centres where the knowledge resources can be accessed with ease.

When it comes to the digital learning and user engagement, the findings reveal the growing significance of digital learning integration, digital literacy programs, and virtual interaction. Majority of respondents admitted that digital technology improved the learning process and research output, in line with Adigun et al. (2024), that observed that digital innovation facilitates growth in knowledge and smarter learning settings.

However, the neutral responses to digital literacy training observed suggest that despite the possibility to trace the improvements, systematic capacity-building interventions are required. This is informed by the earlier anxieties that staff and customers must always adopt new electronic systems (Ullah et al., 2023).

Another significant pillar of digital transformation was cultural heritage conservation. The majority of the respondents agreed that digitization maintains the vulnerable resources, and facilitates their accessibility to every corner of the globe, and enhances cultural survival. This assists Gorman (2006) to declare preservation as one of the essential responsibilities of the modern libraries. However, the data reflect the absence of funds, staff training, and metadata preservation guidelines which can be attributed to the arguments of Afshar and Shah (2025) according to which digital preservation is resource-demanding and requires special expertise. The attitude towards the opportunities of financing is rather ambivalent hence demonstrating that there is effort, yet without the long-term investment program, sustainability is not assured.

Regarding challenges, the respondents pointed out financial constraints, technical constraints, low digital literacy, organizational resistance, and security concerns as the critical change obstacles. Neglia et al. (2024) and Singh (2018) are among those who support such conclusions by noticing that the infrastructural, budgetary, and very fast technological changes make integrating digitally difficult. The fact that the shortages in staff training are highly considered also proves the need to have additional training on digital skills to stay abreast of the future.

The future offers promise, with the majority of respondents anticipating more digital investment, AI adoption, collaborative networks, and the upsurge in user dependence on digital resources. This view is consistent with the opinion of Cox et al. (2019), who predict the use of data-driven and AI-enhanced systems by libraries. Nonetheless, mediocre answers on institutional preparedness also show that change

is taking place and there is need to be committed to strategic planning, building of infrastructure, and development of workforce.

In sum, the discussion indicates that libraries are moving in the direction of digital maturity, but the sustainable development will need the enhancement of the technological infrastructure, professional training, and policy support to streamline the digital access, learning, heritage preservation, and the innovation of the future.

CONCLUSION AND RECOMMENDATIONS

The digital revolution has created a clear definition of the way knowledge is accessed, shared, preserved and experienced in libraries. The findings of this paper indicate that the digital technologies have had massive positive impact in relation to improving access on resources, enhancing user experience, and increasing learning opportunities using the virtual platform and digital reference services. Libraries are gradually transforming into digital interactive centres that facilitate research and learning, collaboration and cultural preservation instead of being seen as the holder of traditional information. Respondents were highly convinced about the worth of digitization and the way it is expanding access to information around the globe and protecting heritage materials against any physical damage. Nevertheless, the analysis shows that there are a number of practical issues which remain. The scarcity of funding, lack of infrastructure, deficiency of skills in the staff as well as different degrees of digital literacy among users still acts as a limiting factor in achieving digital potential to the fullest. Although there has been an improvement, the dynamism of technology requires new changes, proactive measures, and institutional dedication towards innovation..

On the basis of these findings, libraries are advised to give strategic investment in digital infrastructure to achieve a stable system, reliable connection, and convenient platforms. Funding enough is to be considered a long-term priority and not a temporary upgrade. The capacity-building and training programs should be reinforced to provide the professionals working in libraries with the necessary digital skills, such as system management, preservation strategies, and technological advanced skills. It is also important to develop digital literacy programs to make users gain access to more digital resources and implement them properly to close the gap between digital resources accessibility and their proper use. Digital governance, cybersecurity, preservation guidelines, and data protection frameworks should be promoted by altering the policies. The institutions are supposed to encourage networks between the libraries, universities and technology organisations to facilitate resource sharing, knowledge and preservation. Libraries can also use artificial intelligence and automation to improve service provision though slow but steady integration to enable libraries to catalog, provide references, and recommend personalized services. It is essential to conduct a regular evaluation of the needs of users to maintain the relevance, accessibility, and inclusivity of digital services. There should also be a focus on the sustainable digitization programs which include long-term storage, metadata precision and preservation planning. The creation of blended service models where there is a balance between physical and digital resources will also aid in supporting the various users preferences considering that digital adoption is increasing.

Overall, the digital transformation of libraries opens immense opportunities of growth, innovation, and international dissemination of knowledge. Through careful planning, proper provision of resources, personnel training and technological integration, libraries can completely adopt their new digital ecosystem role. By focusing on preservation, teamwork, and the readiness to the future, libraries will be made resilient, efficient, and beneficial to the society. The future of libraries is one in which they become confident through digital capacity building today so that as information gateways they exist as inclusive, dynamic and technologically advanced.

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