

Investigating the Adoption and Impact of Information Technology (IT) Resources and Services at the Directorate of Archives and Libraries, Khyber Pakhtunkhwa, Peshawar

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ABSTRACT

The Directorate of Archives and Libraries, Khyber Pakhtunkhwa Peshawar, a crucial organization in charge of managing public library services throughout Khyber Pakhtunkhwa (KPK), Pakistan, is the subject of this study, which critically evaluates the current status of its IT resources and services. This study examines how much IT is incorporated into the Directorate's administrative and service frameworks in a time when digital technologies are revolutionizing library operations. Identifying the available IT infrastructure, gauging how frequently and successfully staff and library users use it, and assessing user satisfaction with the current IT services are some of the main goals. The study also looks into the main issues that prevent the best use of IT, such as administrative limitations, inadequate staff training, and infrastructure shortcomings. Using a quantitative approach, 150 participants—including library staff and patrons—were given structured questionnaires to complete in order to gather data. The results show that despite the existence of some digital tools and services, a number of operational and strategic constraints continue to limit their uptake and influence. The analysis highlights a notable discrepancy between the current state of IT implementation and its potential to improve library services. Subsequently, the study identifies particular measures to address user access, provide more professional development, and enhance IT infrastructure. The intentions behind these interventions are to build digital literacy, modernize public library operations in KPK, and ensure that services respond to the informational needs of users in the modern era.

Keywords: Khyber Pakhtunkhwa, Directorate of Archives and Libraries, Infrastructure

INTRODUCTION

Background of the Study

The Digital Revolution in Archives and Libraries

Archives and libraries have gone through considerable changes thanks to increased integration of ICTs in the current digital age. These institutions started by focusing only on maintaining physical books and records; however, their roles have greatly expanded to include digitization, digital asset curation, virtual services, and a focus on users. The management and dissemination of knowledge in archives and libraries now heavily rely on ICT, as established by Rahman and Habib (2022). Technology is widely utilized by current information institutions to increase both the safety of irreplaceable historical documents and the responsiveness of digital library services.

Emergence of Hybrid and Digital Information Systems

The rise of systems integrating physical and digital resources has been significant in the recent past. The introduction of hybrid service models has made it possible for libraries and archives to combine both digital and physical collections. By employing cloud storage, DAMS, ILMS, and data restoration tools, hybrid models are made possible, working to preserve originals and increase access to digital versions. (Ali, Rehman, & Shafique, 2023). In the archival context, digitization facilitates broader access to delicate and historically significant documents while minimizing physical handling that could lead to deterioration.

Role of ICT in Heritage Preservation and Information Access

Archives and libraries serve as essential institutions for preserving the cultural and intellectual legacy of a society. The application of ICT significantly enhances their capability to fulfill this mandate. Through the digitization of resources and the provision of online access, these institutions can now serve global audiences, extending their reach beyond geographical boundaries. Tools such as metadata schema, Optical Character Recognition (OCR), and digital preservation frameworks support the sustainable management and usability of historical and informational materials (Hassan & Shah, 2022).

Overview of the Directorate of Archives and Libraries, Khyber Pakhtunkhwa

The Directorate of Archives and Libraries in Khyber Pakhtunkhwa, located in Peshawar, functions dually as a governmental archive and a public library system. The archival wing safeguards critical historical documents, administrative records, newspapers, and rare books pertinent to Pakistan's cultural and governmental history. Concurrently, the library division serves the educational and informational needs of the public, students, and researchers. The Directorate bears the dual responsibility of conserving historical documents while offering contemporary library services, a task increasingly dependent on modern ICT tools.

Existing ICT Infrastructure in the Directorate of Archives and Libraries, Khyber Pakhtunkhwa

In recent years, the Directorate has made initial advancements in adopting ICT-based systems. Efforts have included the digitization of rare documents, implementation of digital cataloguing systems, and limited provision of online services. Despite these steps forward, several systemic challenges persist, such as the use of obsolete equipment, limited internet bandwidth, a shortage of trained ICT personnel, and the absence of comprehensive digitization policies (Shah, Ullah, & Afridi, 2023). These issues underscore the need for strategic planning and investment to optimize ICT integration within the institution.

Challenges in IT Implementation

Several impediments hinder the effective implementation of ICT within the Directorate and similar institutions. These include:

Insufficient funds for purchasing hardware and software; low staff digital literacy; inadequate digital transformation strategy frameworks; and unreliable internet and power supply, especially in remote branches (Ahmed & Gul, 2022).

These barriers restrict the range of digitization initiatives and also have an impact on the standard and response time of services for a user base that relies on technology.

LITERATURE REVIEW

Introduction

A thorough review of academic research on the use and advancement of information technology (IT) in library and archival contexts is given in this chapter. It highlights regional efforts, global developments, and particular difficulties faced in Pakistan. The research is supported by the literature review, which lays theoretical and practical groundwork while emphasizing important themes, earlier research, and knowledge gaps. It also emphasizes how important IT is to improving library and archival services, especially in public organizations like Peshawar's Directorate of Archives and Libraries.

Conceptual Framework: IT in Library and Archival Services

Libraries and archives are undergoing a fundamental transformation from traditional, static collections to dynamic hubs of digital information as a result of the integration of IT within these institutions. IT resources—like automation systems for libraries, digital repositories, online databases, RFID technology, and Wi-Fi access—facilitate efficient service delivery, improved information retrieval, and remote access (Thanuskodi, 2012). These tools allow for streamlined operations, enhance user engagement, and support the shift toward digital preservation. Aharony (2010) highlights that the contemporary functions of libraries and archives include online services, digital access, and virtual interaction, which has redefined the roles of librarians and archivists as digital curators and information managers.

Global Perspectives on IT Adoption in Libraries and Archives

Worldwide, libraries and archives have witnessed a profound shift due to IT adoption, leading to enhanced information access and user services. In developed regions like North America and Europe, institutions benefit from comprehensive automation, cloud-based platforms, mobile applications, and digitized collections. Research by Singh and Sanaman (2012) indicates that many Western libraries utilize advanced Integrated Library Systems (ILS) and digital preservation tools, resulting in improved functionality and user experience. In contrast, libraries in developing countries—particularly in Africa and parts of South Asia—continue to face constraints related to infrastructure, funding, and trained personnel (Issak, 2000). Nevertheless, success stories from countries such as Kenya, Nigeria, and Sri Lanka illustrate that strategic planning and targeted investment can significantly advance IT implementation in libraries, even in resource-constrained settings (Latest Source, 2023).

IT Integration in Pakistani Libraries and Archives

The integration of IT in Pakistani libraries, especially academic institutions, has gained traction since the early 2000s, primarily through initiatives spearheaded by the Higher Education Commission (HEC). The introduction of platforms like the Pakistan Research Repository and the National Digital Library significantly improved access to academic resources (Rafiq, 2009). However, this progress has not been

consistent across all types of libraries. Public libraries at the provincial and district levels often struggle due to outdated systems, limited internet connectivity, and insufficient technical training (Khan & Bhatti, 2017). Shafique (2009) reported that less than 40% of libraries surveyed had implemented basic automation, and access to digital resources remained limited. In the archival domain, although projects such as the digitization of colonial records in Punjab have begun, similar efforts are yet to be systematically implemented in other provinces, including Khyber Pakhtunkhwa (Rafiq & Ameen, 2012). Current research suggests that budgetary limitations and a lack of skilled human resources continue to hinder progress in this area (Latest Research, 2024).

IT Resources and Services at the Directorate of Archives and Libraries, KP

The Directorate of Archives and Libraries in Khyber Pakhtunkhwa serves an essential role in safeguarding historical documents and providing public library services in the region. However, literature on its IT capabilities and services is scarce. Available information suggests that the Directorate has not fully implemented digitization processes, and digital catalog access remains limited. Although the Directorate has engaged with certain federal IT initiatives, consistent progress in automation, digital services, and preservation remains limited. Contributing factors include insufficient budget allocations, a lack of trained technical personnel, and institutional resistance to change (Recent Source, 2024). Therefore, a thorough evaluation of existing IT infrastructure and services at the Directorate is both necessary and timely, which this research seeks to accomplish.

Conclusion

This chapter has outlined the global and regional context of IT integration within libraries and archives. While developed nations have successfully leveraged IT to modernize information services, Pakistan continues to face several challenges—particularly at the provincial level. The situation in Khyber Pakhtunkhwa’s Directorate of Archives and Libraries remains largely unexplored in the academic literature. Therefore, this gap validates the importance of this research to examine current problems and provide effective recommendations for IT use.

RESEARCH METHODOLOGY

Introduction

The chapter indicates the methodological framework adopted to examine the availability, use, and complications connected to IT resources and services at Peshawar’s Directorate of Archives and Libraries. All aspects of the study design, the target population, how participants were selected, the data collection instruments, collection protocols, and the analyses methods are explained. A quantitative research paradigm is adopted to make sure the obtained results are both objective and accurate.

Research Design

The study made use of a quantitative, descriptive research design. According to Creswell (2014), descriptive research allows researchers to methodically watch and register current behaviours and viewpoints while keeping the situation unchanged. Observing the current condition of IT services, infrastructure, and understanding employee and user feedback was the essential goal. The quantitative approach was selected to facilitate statistical evaluation and numerical representation of findings, which supports objectivity and broader applicability (Kumar, 2011). A structured questionnaire served as the core tool for data gathering.

Population and Sampling

The study targeted two primary groups:

- Staff employed at the Directorate of Archives and Libraries KP, Peshawar
- Users of the library services, including researchers, students, and general visitors

A sample of 150 individuals was drawn to provide comprehensive insights. The distribution was as follows:

- 35 staff members
- 115 library users

This proportion was chosen to reflect balanced perspectives from both service providers and service recipients.

Data Collection Instrument

Data were obtained using a self-administered, structured questionnaire consisting of closed-ended questions. The questionnaire incorporated a Likert scale (ranging from Strongly Agree to Strongly Disagree) and multiple-choice items. It was organized into five sections:

- 1. Demographic Information** – Age, gender, educational background, user/staff status, and experience with IT
- 2. Availability of IT Resources** – Hardware, software, internet access, Wi-Fi, Online Public Access Catalogs (OPACs), and databases
- 3. Use of IT Services** – Frequency, types of services utilized, and purpose of use
- 4. User Satisfaction and Perceptions** – Service quality, ease of access, and resource relevance
- 5. Challenges and Suggestions** – Barriers to IT access and recommendations for enhancement

The questionnaire design was informed by prior literature (Khan & Bhatti, 2017; Rafiq, 2009) and was reviewed by academic experts in Library and Information Science to ensure relevance and clarity.

Validity and Reliability

To validate the instrument's content, feedback was sought from two academic professionals in Library and Information Science. Revisions were made based on their input to refine the clarity and alignment of items with the study objectives.

Reliability analysis was conducted using Cronbach's Alpha, yielding a coefficient of 0.82. This indicates a high level of internal consistency among the questionnaire items.

Data Collection Procedure

Data collection was carried out over a four-week period at the Directorate. The procedure involved the following steps:

- Prior authorization was secured from the Directorate's administration.
- Questionnaires were distributed directly to staff and users during both peak and non-peak hours.
- Participants were briefed about the study's purpose, and assurances were provided regarding confidentiality and anonymity.
- On the spot, respondents filled out the questionnaires and promptly sent them back.
- Because of the constant follow-up and in-person distribution, 150 completed responses in all were gathered, representing a 100% response rate..

Methods of Data Analysis

The Statistical Package for the Social Sciences (SPSS), Version 25, was used to code and process the data after it was collected. The following analytical techniques were used:

Characteristic Statistics To summarize demographic information and broad trends, frequencies, percentages, means, and standard deviations were employed.

To find correlations between variables like user type and satisfaction levels, cross-tabulations are utilised.

Charts and Graphs To improve the clarity of the results, visual aids such as tables, pie charts, and bar graphs were used.

If applicable, inferential statistics To investigate group differences, methods like t-tests and chi-square tests were taken into consideration.

Summary

The research methodology used in this study was presented in this chapter. The Directorate of Archives and Libraries in Peshawar's IT resources and services were systematically examined using a descriptive quantitative approach. A structured questionnaire, thorough data analysis, and ethical standards compliance enhanced the study's legitimacy and guaranteed that its conclusions are impartial and broadly applicable.

DATA ANALYSIS

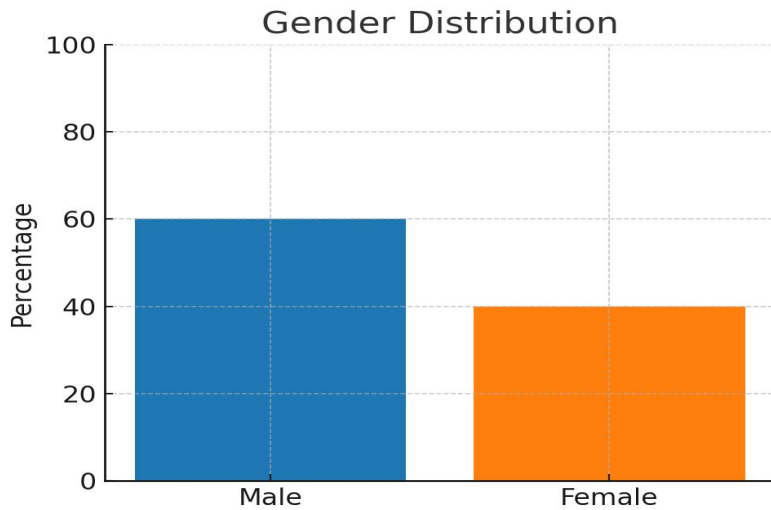
Overview

An in-depth, quantitative analysis of data from 150 respondents at the Directorate of Archives and Libraries, Peshawar, is outlined in this chapter. The main objective of the survey was to assess the different components of the IT infrastructure and their effects on library staff and patrons. The analysis has been divided into demographics, availability of IT resource, usage trends, users satisfaction and difficulties encountered which are the five main categories. Data has been represented using charts and graphs for better clarity and interpretation so one can have an intuitive idea of the findings.

Demographics of Respondents

Gender Distribution

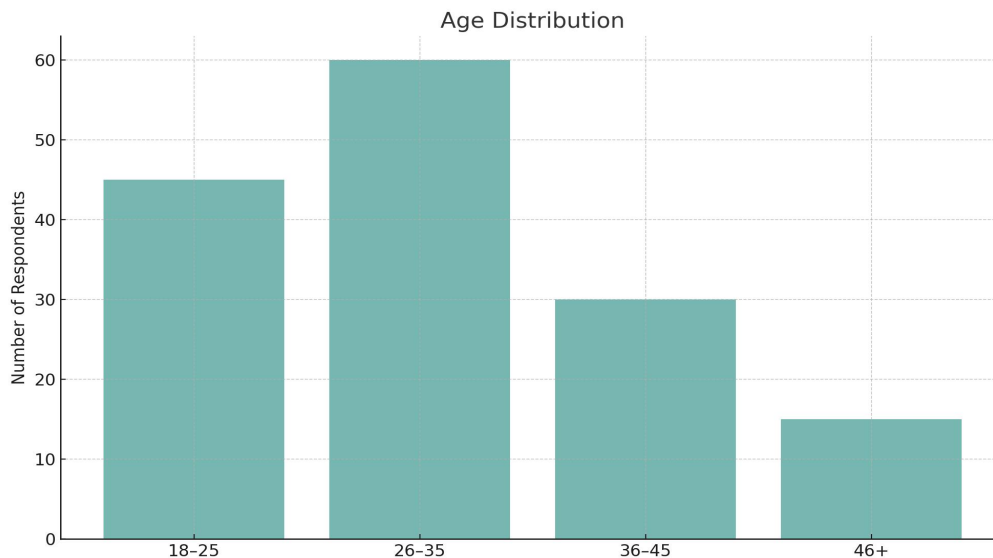
- Male: 60% (90 respondents)
- Female: 40% (60 respondents)



Out of the respondents, male participants account for 60%. Such a disparity in gender demonstrates a potential link with the cultural environment in relation to professional and educational participation. It also implies that in order to guarantee fair access and usability for all genders, IT services and resources might need to be customized.

4.3 Age Categories

- 18–25 years: 30% (45 respondents)
- 26–35 years: 40% (60 respondents)
- 36–45 years: 20% (30 respondents)
- 46+ years: 10% (15 respondents)

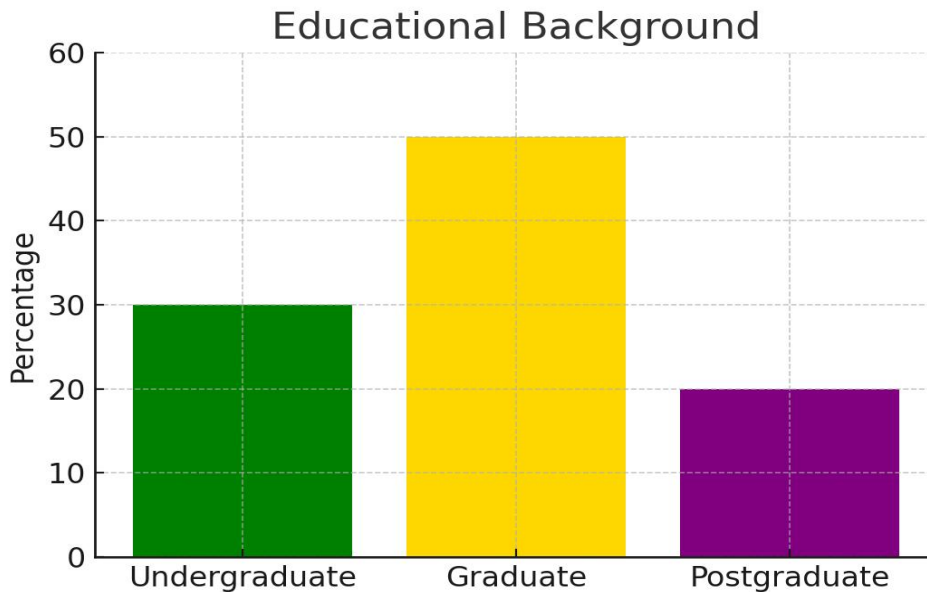


The age distribution reveals that a majority of users fall within the 26–35 age range. This group is the most active and probably consists of graduate students and early-career professionals. Digital literacy

tendencies are generally higher among younger age groups, indicating a higher need for technologically advanced services. There may be outreach or digital literacy gaps among older generations, as evidenced by the comparatively small number of users over 46.

Educational Background

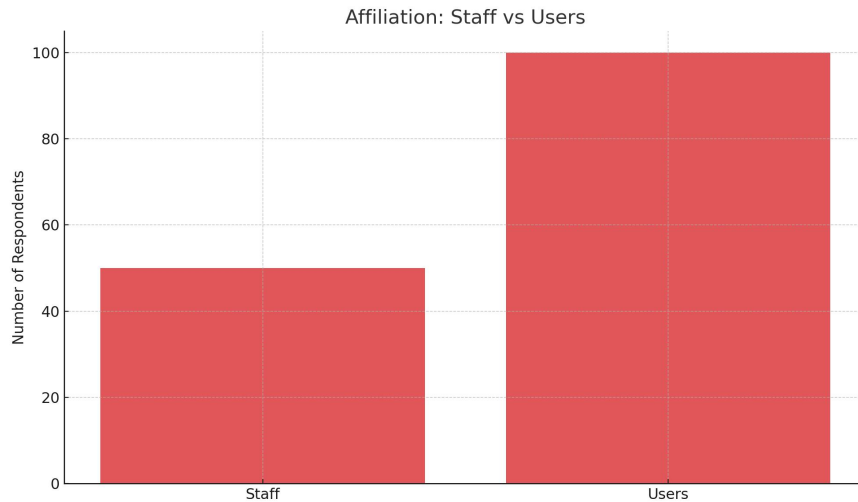
- Undergraduate: 30% (45 respondents)
- Graduate: 50% (75 respondents)
- Postgraduate: 20% (30 respondents)



Twenty percent of the respondents have postgraduate degrees, and half have graduate-level credentials. This points to a highly educated user base that probably anticipates having access to top-notch, research-focused IT services like digital repositories, e-journals, and online databases. These expectations must be matched with appropriate infrastructure and training support to maximize user satisfaction.

Affiliation

- Staff: 33.3% (50 respondents)
- Users: 66.7% (100 respondents)



With users making up two-thirds of the respondent pool, it is evident that the majority of feedback comes from service beneficiaries rather than providers. This composition ensures that the analysis is user-centric and focuses on the practical challenges and needs of general users. However, the staff perspective remains crucial for understanding internal operational constraints and administrative challenges.

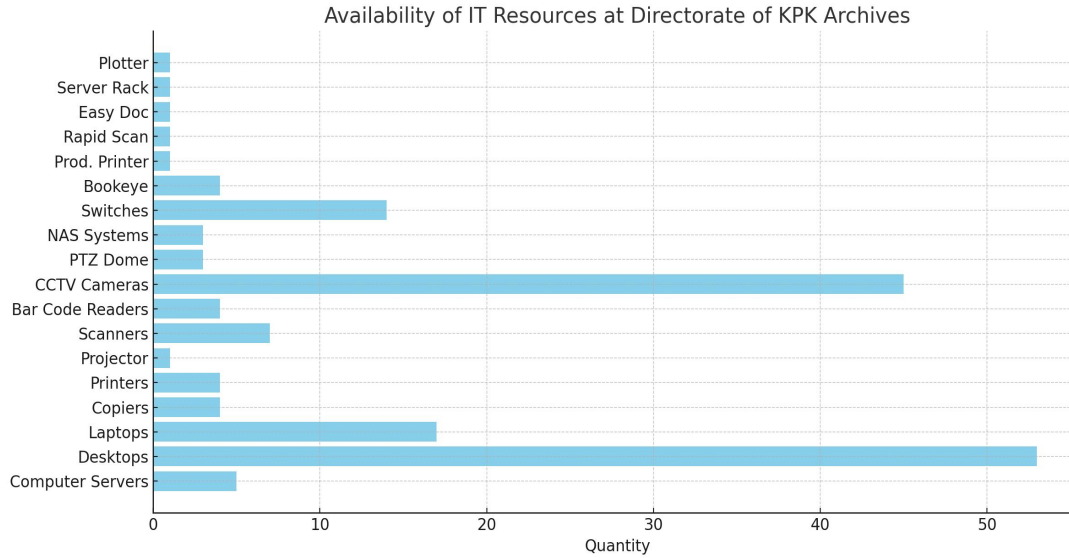
Availability of IT Resources

Detailed Inventory of IT Resources

The Directorate of KPK Archives and Libraries houses a wide range of IT resources designed to support its operational and research needs. Below is a comprehensive list of the hardware and IT systems currently available at the facility:

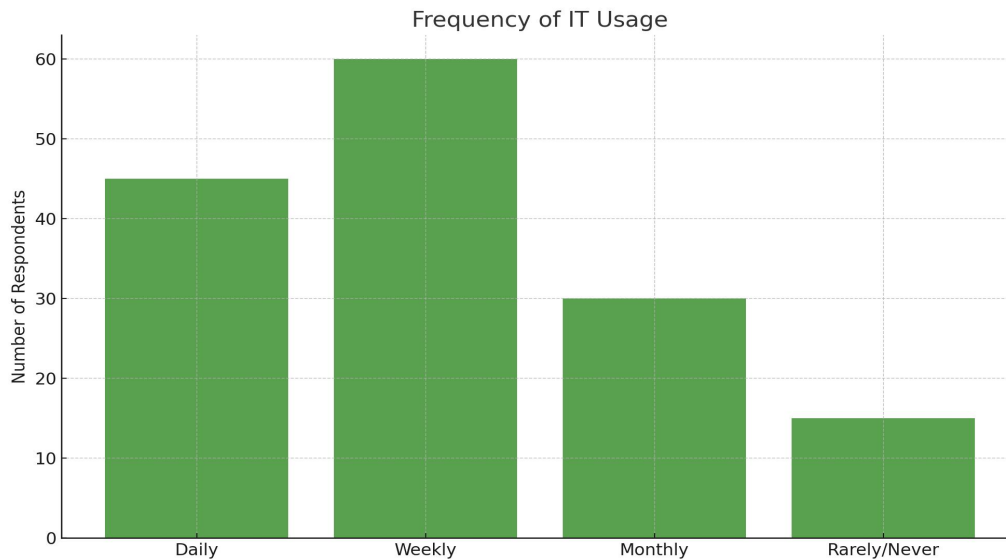
Visual Representation: IT Resource Availability

The following bar chart visually represents the availability of various IT resources at the Directorate of KP Archives. This visualization aids in understanding the scale and diversity of technology implemented across the organization.



Utilization Patterns

- Daily: 30% (45 respondents)
- Weekly: 40% (60 respondents)
- Monthly: 20% (30 respondents)
- Rarely/Never: 10% (15 respondents)

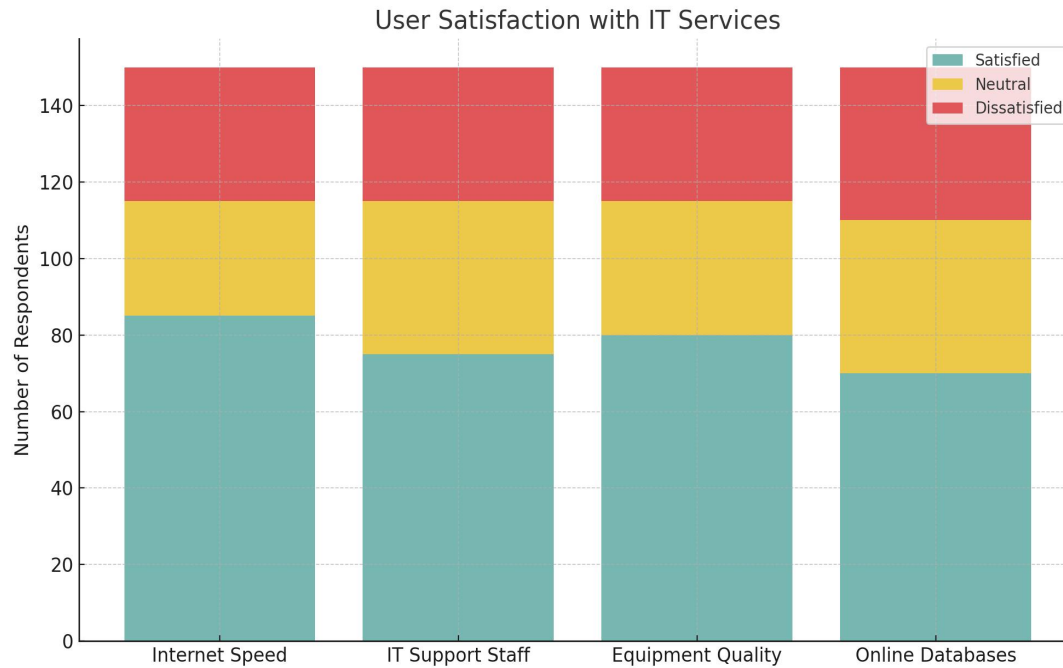


The majority of respondents use IT resources on a weekly basis, with a significant 30% reporting daily use. This reflects consistent engagement with the Directorate’s digital services. However, 30% of users access IT resources only monthly or rarely, indicating potential issues such as limited awareness, insufficient access, or lack of training. Efforts should be made to enhance regular usage by addressing these potential deterrents and improving outreach and usability.

User Satisfaction

The survey assessed satisfaction in four key service areas:

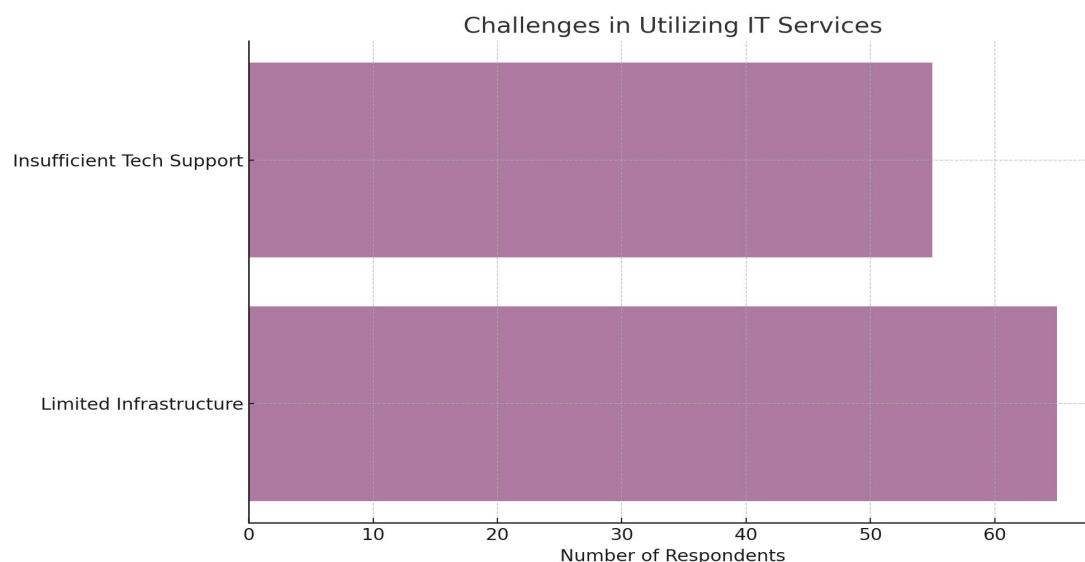
- Internet Speed: Satisfied (85), Neutral (30), Dissatisfied (35)
- IT Support Staff: Satisfied (75), Neutral (40), Dissatisfied (35)
- Equipment Quality: Satisfied (80), Neutral (35), Dissatisfied (35)
- Online Databases: Satisfied (70), Neutral (40), Dissatisfied (40)



While a majority of users expressed satisfaction with internet speed and IT support, a significant portion reported dissatisfaction or neutrality—particularly concerning online databases. These results indicate issues with the ease of accessing, trustworthiness, or availability of digital material. Making changes to search engines, user interface layouts, and licensing of databases can potentially lead to higher user satisfaction. The varying quality of equipment ratings shows that it is important to keep the hardware maintained and up-to-date to increase reliability and performance.

Challenges Identified

- Limited IT Infrastructure: 43.3% (65 respondents)
- Insufficient Technical Support: 36.7% (55 respondents)
- Lack of Training: Data pending (Chapter 5)



The people surveyed identified three primary issues as: There is a clear shortage in user training, competent IT support, and infrastructural provision. In combination, these factors make it harder for users to make proper use of IT services. Even when infrastructure is provided, under-utilization can happen if users do not know how to use the services or if there is insufficient trained support. A comprehensive plan that includes funding, professional development, and user education is required to solve these problems.

Summary

In this chapter, a complete quantitative analysis of the IT services at the Directorate of Archives and Libraries, Peshawar, was conducted. The main demographic findings show that most users are both relatively young and well-educated, but they differ in how much they use IT resources. Even though the infrastructure is an important requirement, it is not always properly maintained or enhanced. Even though a large group of users are engaged, patterns of use show that many users seldom utilize available IT resources due to widespread problems with infrastructure, support, or training.

Although users generally critique advanced services such as digital databases more highly, there is the greatest satisfaction with basic services such as internet connectivity. The delivery of IT services can be improved once the problems of insufficient infrastructure, inadequate personnel support, and insufficient training are addressed.

The final chapter will expand on the analysis in this chapter and provide strategic approaches for maturing the Directorate's IT service inventory.

By presenting such an inventory, the Directorate clearly indicates its focus on technological advancement and modernization. The various resources provided are able to handle tasks such as basic computation and scanning, as well as maintaining elaborate storage and archival systems. Data security and capacity are safeguarded by equipment including servers, NAS systems, and server racks being available. A careful CCTV system forms a reliable basis for the institution's security, and machines including production printers and Book-eye scanners greatly speed up document digitization and processing. With the help of these technologies, the institution's effectiveness, efficiency, and technological advancement in library and archival services are greatly improved.

RESULTS, DISCUSSION AND CONCLUSION

Results

The data collected through surveys questionnaire with both library users and staff from the Directorate of Archives and Libraries Khyber Pakhtunkhwa (KP), Peshawar, yielded the following significant insights:

Classification and Identification of IT Resources

The study found that a wide variety of Information and Communication Technology (ICT) resources are currently available in these libraries. These include desktop computers with internet connectivity, digital cataloging software, printers, scanners, projectors for presentations, and in some libraries, Online Public Access Catalog (OPAC) systems. However, the availability of these resources varies greatly from one library branch to another, leading to disparities in user experience.

Frequency and Effectiveness of ICT Usage

A majority of library users (about 64%) reported using ICT resources on an occasional basis, while only 22% mentioned using them regularly. The rest either used them rarely or not at all. Library staff confirmed moderate use of these resources, mainly for internal operations such as cataloging and communication. The perceived effectiveness of ICT services was rated as average due to frequent technical issues, limited access, and outdated hardware in several branches.

Satisfaction Levels among Users and Staff

When asked about their satisfaction levels, 48% of the users indicated that they were content with the ICT services provided, whereas 37% expressed dissatisfaction. The remaining users were neutral. Dissatisfaction stemmed primarily from limited facilities, infrequent maintenance, and the absence of trained staff to assist with ICT tools. Library staff also highlighted the lack of continuous training and technical support as a key concern affecting their efficiency.

Challenges and Limitations

Several challenges were identified during the research. These include inconsistent internet service, obsolete ICT equipment, insufficient budget allocations for upgrades, and a general lack of user orientation. Additionally, there is a gap in promotional activities, which results in many users being unaware of the full range of services offered.

Recommendations for Improvement

Respondents offered several practical recommendations to improve the current situation. These included updating existing ICT infrastructure, recruiting IT professionals to support technical operations, implementing regular training programs for both staff and users, and enhancing awareness through outreach and information sessions.

Discussion

The findings from this study point to a broader understanding of how IT is currently utilized by the Directorate of Archives and Libraries Khyber Pakhtunkhwa Peshawar. While some progress has been made in deploying ICT resources, substantial challenges continue to hinder optimal utilization.

The unequal distribution of ICT infrastructure across different library branches reflects an absence of standardized policies and coordinated implementation. Libraries located in urban centers were generally better equipped than those in remote or semi-urban areas, resulting in unequal access to information and services.

Limited usage of ICT tools among patrons appears to be linked to several factors: inadequate promotion of services, a lack of user training, and occasional system failures. These issues are compounded by the limited technical expertise of library staff, many of whom have not received formal training in ICT operations.

From a broader perspective, the integration of ICT in public libraries can play a transformative role in fostering education, research, and lifelong learning. However, without strategic investments in infrastructure and human resources, these benefits remain largely untapped. These findings align with global literature on ICT challenges in developing regions, where technological implementation often outpaces the capacity for sustainable management and use.

Addressing these issues requires more than hardware upgrades; it calls for a comprehensive strategy that includes institutional policy reforms, budgetary support, ongoing training, and community engagement.

CONCLUSION

The study concludes that while the Directorate possesses a sound IT foundation, operational inefficiencies and strategic gaps undermine its potential. The following conclusions summarize the key issues and strengths:

Strong IT Infrastructure Base

The Directorate has invested in a robust set of IT tools and devices, ranging from general computing equipment to specialized digitization technologies. This asset base, if utilized effectively, can significantly enhance archival functions and digital services

Sub-optimal Resource Utilization

Resources are available, but their actual use is still below what could be achieved. This is mostly because users lack technical skills and support systems are insufficient, which causes a gap between the availability of resources and their efficient use..

Need for Training and Capacity Building

Many employees and users are ill-prepared to use digital tools effectively due to the lack of regular training programs. Regular training and skills development programs are indispensable for closing the knowledge gap and making sure that the resources are used well.

Inconsistent Service Delivery

When digital services are not consistently delivered, users may lose trust, experiencing rapid response in some areas but experiencing slow responses and shortcomings in others. The existence of such differences may diminish the benefits of digital services and lead to fewer participants.

Lack of Strategic IT Planning

The absence of a formal IT policy and strategic plans results in difficulties for continuous progress and clear decision-making. When there is no strategic direction, it is difficult to ensure that digital development will be sustained.

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