NAVIGATING BARRIERS TO SUCCESSFUL IMPLEMENTATION OF DIGITAL RECORD MANAGEMENT SYSTEM: A CASE STUDY OF PAKISTANI PUBLIC SECTOR UNIVERSITIES

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ABSTRACT

A wide range of challenges are present in the successful implementation of Digital Record Management Systems (DRMS) within the context of public sector universities in Pakistan. In response to the growing imperative for modernizing record-management practices, this research has explored the barriers encountered during the adoption and integration of DRMS. A sample of 60 employees was taken from three public sector universities for this study. Using a qualitative research design, data was collected through a questionnaire having 17 statements. The study identified various barriers to the successful implementation of DRMS, including technological, organizational, and cultural dimensions. Technological challenges include issues related to infrastructure limitations, integration with existing systems, and data security concerns. Organizational barriers manifest in resistance to switching from manual to computerized systems, inadequate training programs, and the absence of strong implementation strategies. Cultural barriers, including lack of confidence and computer literacy, rooted in established record-keeping practices, further contribute to the digitization of previous manual records. The findings underscored the critical importance of addressing these barriers for the successful implementation and sustained use of DRMS in Pakistani public sector universities. Moreover, to present a comprehensive analysis of challenges, the research provided actionable insights and recommendations, including a proper implementation plan, procuring required infrastructure, targeted capacity-building initiatives, and the proper training sessions for record-keepers on DRMS.

Keywords: *Digital Record Management Systems; Implementation issues of DRMS; Challenges in deploying DRMS; Digital Transformation.*

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INTRODUCTION

Higher Education Institutions (HEIs) are facing the challenge of maintaining their students, employees, and organizational information to produce intricate real-time reports. Organizations can derive benefits by integrating Enterprise Resource Planning (ERP) / Digital Record Management (DRMS) systems after successfully addressing the identified challenges within the organization and can shape their record management style in a smooth and effective manner to improve the productivity of work for the betterment of the organizational growth. So, these systems are essential for effective resource allocation and informed decision-making. Higher education institutions (HEIs) are compelled to adopt modern technologies to remain competitive and establish themselves as innovation leaders (ElFarmawi, 2019; Janett & Yeracaris, 2020). For planning to make digital record management systems successful and acceptable, research was conducted at a university in Saudi Arabia to understand digital record management system adoption based on the unified theory of acceptance and use of technology (UTAUT). That study extended the UTAUT model with additional constructs, offering a theoretical contribution to better comprehend users' adoption behavior in the unique context of HEIs (Bamufleh et al., 2021; Marcon et al., 2019; Nesterchuk et al., 2020). In a previous study, the positive impact of ERP/DRMS was highlighted which shows that, such systems should be initiated in higher education institutes for making record management smartly and effectively. By using DRMS, the organizations can utilize their resources and plan their academic as well as administrative processes in an efficient manner by utilizing the limited human resource because, when organization grows rapidly, it requires more human resource to handle manual paper-based record management which is slow and risky. Manual record management is not a safe way to keep organization’s huge and crucial information, it may be results the loss of important information of students, employees and organizational documentation (Andrianto, 2019; Chukwu Scholastica et al., 2018). In comparison to the corporate sector, a small number of acceptance rates are observed in the educational sector and still much research are being conducted in this area. Many private sector universities have applied ERP/DRMS solutions or are under development of deploying the DRMS, but the failure rate of implementation of such automated systems in HEIs is much greater as compared to other sectors. After examining the factors of this failure, two categories of these factors were identified in understanding ERP adoption and technology acceptance: employees who are less computer literate and organizational budgeting issues for developing or procuring such systems, cost for infrastructure setup, and hiring a team to maintain the system (Albarghouthi et al., 2020). In our previous study, we developed a Smart Record Management System (SRMS) according to

the need for record-keeping features such as a user-friendly graphical user interface, efficient, transparent, and easy access to information (Nooruddin, 2021). The software was evaluated by 60 employees from three selected universities and participants reported that the application is useful, easy, and effective. Such a system should be part of record keeping. While interviewing some participants, the participants were doubtful, and they raised a surprising question about the successful deployment of SRMS in universities. In continuation of that surprising question and doubt, it was suggested to conduct research to find out the factors influencing in successful implementation of such systems like SRMS, DRMS, and ERP (Brohi et al., 2023).

Problem Statement

Record management poses a critical challenge in organizational record-keeping, particularly in public sector universities in Pakistan. The transition from manual or semi-computerized systems to fully computerized systems is crucial for efficient record management which has been challenging for less computer-literate employees and other managerial factors are also there. Only a limited number of Pakistani public sector universities are using fully digitalized record management systems, the remaining are using manual and semi-computerized systems. There is a need for a comprehensive approach to highlight the barriers to the successful implementation of Digital Record Management Systems (DRMS) in such important organizations.

Research Objectives

The objectives of this study are:

i. To navigate barriers in the successful implementation of digital record management systems in public sector universities in Pakistan.
ii. To analyze the adaptation of DRMS among employees.
iii. Guidelines for switching from manual to computerized systems.

LITERATURE REVIEW

Previously, studies have concentrated on investigating higher failure rates of Enterprise Resource Planning (ERP) implementation in Higher Education Institutions (HEIs) (Albarghouthi et al., 2020). The research studies were conducted using the Technology Acceptance Model, focusing on critical factors like individual (e.g., computer self-efficacy) and organizational (e.g., top management) aspects influencing ERP successful adoption in HEIs. Andrianto (2019) assessed the impact of ERP/DRMS on employees' performance using a qualitative, descriptive, analytical, and evaluative approach, focusing on performance

indicators such as quantity of work, quality of work, role awareness, creativeness cooperation, dependability, initiative, and personal qualities. Their findings suggested that ERP/DRMS implementation at the University of Jember had positively influenced user performance components. Similarly, Bamufleh et al. (2021) proposed a conceptual framework for factors influencing ERP system users in Higher Education Institutions (HEIs), extending the UTAUT model with complexity and system quality. While ERP systems had enhanced efficiency and satisfaction, their implementation had posed challenges, including user resistance. Brohi et al. (2023) emphasized the drawbacks of manual documentation, citing risks of information loss and increased human resource demands for paperwork management. It explored the benefits of fully automated systems and addressed the question of their superiority over manual or semi-computerized alternatives. The study developed and evaluated a web-based Smart Record Management Solution (SRMS) in three universities in Sindh, Pakistan, with a focus on usability testing. Results indicated that the majority of participants had found the application easy to use and had expressed satisfaction, suggesting promising potential for the successful implementation of SRMS in the future. ElFarmawi (2019) used a quantitative approach to explore the challenges faced by medium-sized businesses in Saudi Arabia during ERP implementation and its impacts on productivity, profitability, and business process engineering based on 75 survey respondents revealed that organizations benefited from ERP systems after overcoming internal challenges. In this regard, Janett and Yeracaris (2020) examined electronic medical records (EMRs) as a solution to healthcare challenges, emphasizing the need for standardized interfaces. Drawing from extensive experience, it recommended EMR use in primary healthcare and highlighted the potential for revolutionary patient care with appropriately implemented EMRs. Moreover, Hamouche (2023) conducted a general literature review to explore the impact of the pandemic on Human Resource Management (HRM). It identified challenges and opportunities, aiming to provide insights for managers and HRM practitioners to navigate the crisis and anticipate potential organizational directions that might have emerged from these challenges and opportunities. Tavana et al. (2020) reviewed IoT-based ERP, exploring challenges, applications, and architecture. Data collected via IoT had been stored in the cloud and managed through DRMS/ERP, showing potential for automated data processing. The discussion highlighted challenges and opportunities arising from the cloud's impact on the relationship between ERP and IoT. Chofreh et al. (2020) addressed a gap in research by developing comprehensive guidelines for implementing Sustainable ERP systems. The guidelines had been derived from literature on sustainability, project management, organizational decision levels, and strategic management, providing practitioners

with formal steps and activities to efficiently implement Sustainable ERP systems in corporate value chains. Chofreh et al. (2018) assessed the usability of a previously developed Sustainable Enterprise Resource Planning (S-ERP) roadmap via peer review, proposing a division into sustainable enterprise and sustainable integrated enterprise. The roadmap has been found applicable across industries serving as a valuable guide for practitioners and establishing a theoretical foundation for further studies on S-ERP system implementation. Pandey et al. (2022) identified implementation issues and challenges, offering recommendations to address them. Objectives included sharing knowledge about digital record management systems, understanding their impact on various business operations, analyzing risks and challenges in implementation, and proposing strategies for successful DRMS system integration in workplaces. Malekani (2023) investigated the employee perceptions and challenges related to EDMS use. Results suggested that EDMS enhances efficiency and accountability. Duration at work and effectiveness rating had been significant contributors to perceived usefulness. Improved internet speed has been recommended for EDMS enhancement. Ramzan et al. (2021) studied the librarian's behavior toward information technology applications and found generally positive attitudes, with some confusion regarding ownership of information technology applications. Rafiq et al. (2018) utilized both quantitative (QUAN) and qualitative (QUAL) data and identified key barriers to digitization initiatives in university libraries in Pakistan. The major weaknesses included a shortage of knowledgeable and skillful human resources, insufficient financial resources, inadequate technological resources (Husain et al., 20129) and infrastructure, and the absence of digitization policies. Ashari and Pramusinto (2018), examined user satisfaction with electronic document management systems and discussed factors such as content, accuracy, ease of use, format, and response time and found out the satisfaction of users through questionnaires. This study displayed a positive impact on user satisfaction. Hence, de Oliveira Pereira et al. (2020) indicated various challenges and barriers in implementing digital technologies, including limited digital skills, lack of a common framework, misalignment with headquarters' strategies, higher technology acquisition costs in Brazil, and insufficient understanding of implementation across contexts. Yatin et al. (2018) focused on new trends in record-keeping and organizing data centers. Furthermore, major problems like internet access, hosting, distribution, file storage, and backup are also discussed.

METHODS

In order to attain the desired outcomes and undertake any research, establishing a robust research organization is crucial. Figure 1 illustrates the comprehensive methodology employed in this research as presented step-by-step in the diagram.

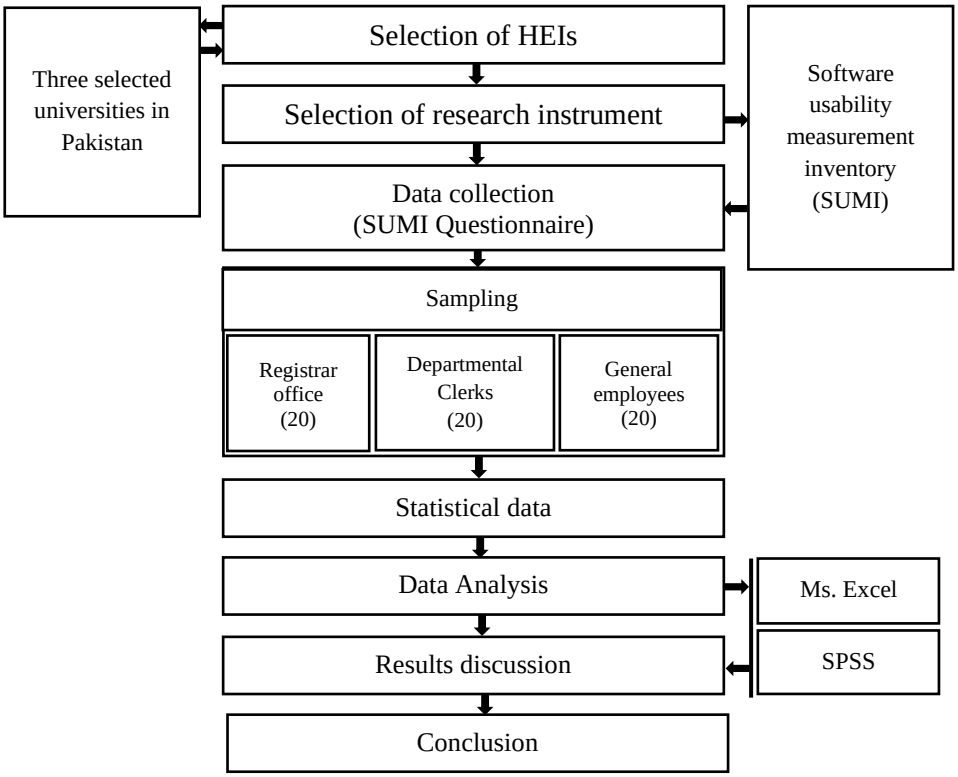

Figure 1. *Research Methodology*

Selection of HEIs

For this study, three higher education institutions were chosen, and the research was carried out within the respective university premises on various days, considering factors such as time and distance availability. Employees from the following universities actively participated:

1. Quaid-e-Awam University of Engineering, Science & Technology, Nawabshah, Pakistan.
2. Shaheed Benazir Bhutto University, Shaheed Benazirabad, Pakistan.
3. Peoples Medical University of Health and Science for Women, Nawabshah, Pakistan.

Sampling

A sample of 20 employees was chosen from each university, resulting in a total of 60 participants across all three institutions. The participants were categorized into three groups: i.) Registrar office clerks, ii.) Departmental Clerks, and iii.) General employees. To ensure gender balance, both male and female employees actively took part in the study as mentioned in Table 1.

Table 1. Participants' Demographic data

Demographics	Particulars	Percentage (%)
Gender	Male	87%
	Female	13%
Age	20-25	08%
	26-30	62%
	31-35	25%
	Above 35	05%
Qualification	Graduation	43%
	Post-Graduation	57%
Years using computer	1-5	10%
	6-10	27%
	11-15	42%
	16-20	15%
	Above 20	07%
Computer usage routine	Daily	97%
	Weekly	03%
	Monthly	0%
	Occasionally	0%
	Never	0%

Implementation issues of Digital Record Management System

A reliable research instrument, the Software Usability Measurement Inventory (SUMI) (Kirakowski, 1996) was used. The Software Usability Measurement Inventory is a carefully verified and proven process to measure the quality of software and implementation issues according to user feedback. The questionnaire consisted of seventeen statements having a 5-point Likert scale (1) Strongly Agree (3) Agree (3) Neutral (4) Disagree (5) Strongly Disagree.

RESULTS AND ANALYSIS

Data Collection

The questionnaire comprising demographic data of participants along with seventeen statements addressing the issues was distributed among the participants to collect data on issues related to implementing a Digital Record Management System, and feedback was obtained from the participants regarding the implementation barriers of such a system is a public sector university.

Demographic Data

In the questionnaire, there was a section for demographic data, including gender, age, qualification, years of computer usage, and routine computer usage.

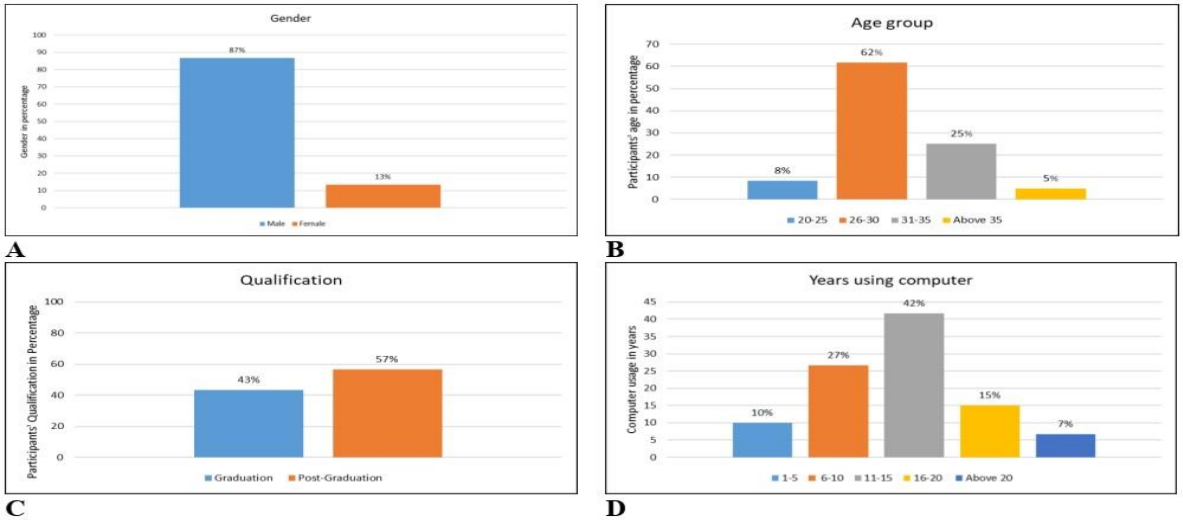

Figure 2. *Demographic Data*

The participants in this study were both male and female employees of Higher Education Institutes in Pakistan. In Figure 2.A, the gender distribution of participants is illustrated, according to the figure, 87% were male, and 13% were female. Figure 2.B showing the age of participants, where four levels were defined (1) 20-25 years (2) 26-30 years (3) 31-35 years (4) >35. As per figure 2.B, 8% participants were between the age of 20-25 years, 62% were 26-30 years old, 25% were 31 -35 years, and 5% were above 35. Figure 2.C highlighted the qualification of participants where two levels were defined (1) Graduate (2) Post-graduate. According to the figure, 43% were graduates and 57% were post-graduate. Figure 2.D shows the years of computer usage of the participants in which five levels were added (1) 1-5 (2) 6 -10 (3) 11-15 (4) 16-20 (5) Above 20. According to Figure 2.D, participants' usage of the computer from 1-5 years were 10%, 6 -10 years observed as 27%, the highest level observed as 11-15 years, they were 42%, 16-20 years recorded as 15% and only 6% were obtained as 20 years using the computer.

Data Analysis

Data was collected using a questionnaire and analyzed by statistical tools e.g., Microsoft Excel 2016 and SPSS V 21.0. The data was collected through the questionnaire to examine the factors affecting in successful implementation of application in sampled universities. 17 statements were asked by the participants and the final results were derived from the data. Finally, the recommendations were made on the behalf of the results.

Issues in Implementing Digital Record Management System (DRMS)

The issues in implementing Digital Record Management System (DRMS) were highlighted through the feedback form different employees using a questionnaire consists of 17 statements

having 5-point Likert scale (1) Strongly Agree (3) Agree (3) Neutral (4) Disagree (5) Strongly Disagree, related with the issues may be the barrier in successful implementation of such type of system. Furthermore, the statements in questionnaire were distributed in five sub-parts to analyze the results in a meaningful manner including, 1. University management and budgeting issues, 2. Lack of expertise on DRMS, 3. Lack of planning and networking, 4. Technology fear and lack of awareness on DRMS, 5. Technical support.

1. University management and budgeting issues

As stated, the questionnaire was comprised of five parts, part-1, University management and budgeting issues, as illustrated in Figure 3. That shows the response of participants from statement 1-4. The results of this section highlight the issues arising due to the failure of top management and insufficient funding. A good number of participants responded as strongly agree and agree, while the second-largest attempt is recorded as neutral. Less number of participants selected disagree and strongly disagree with statements 1-4.

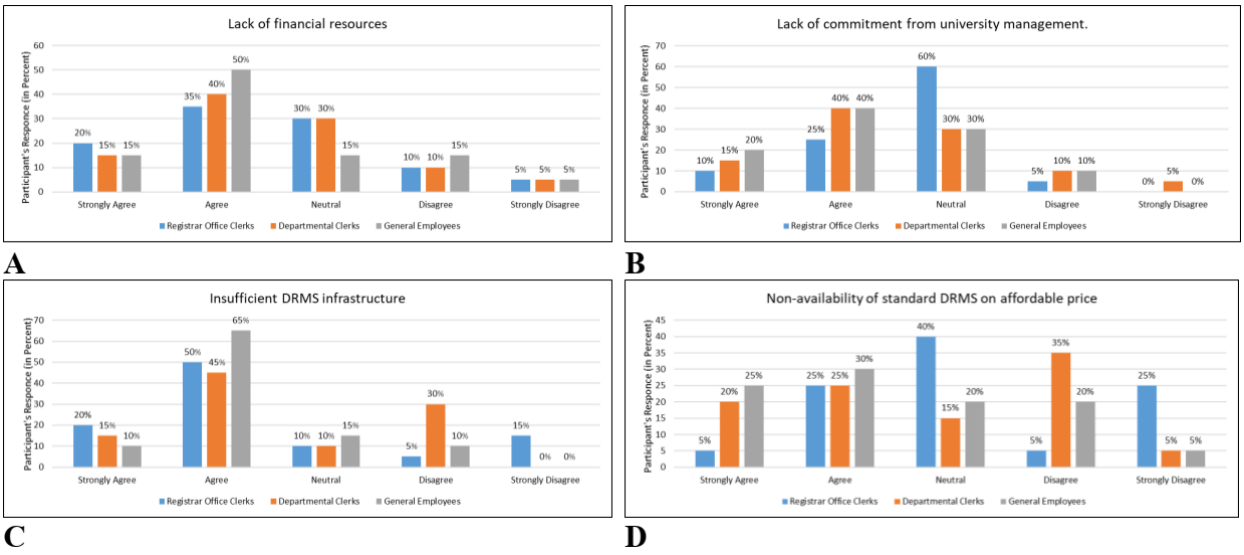

Figure 3. *University Management & Budgeting Issues*

2. Lack of expertise on DRMS

The deficiency in expertise related to Digital Record Management Systems (DRMS) is depicted in Figure 4, showcasing participant responses to statements 5-8. The outcomes of this section underscore challenges stemming from a lack of expertise in Digital Record Management Systems. Participant responses predominantly align with strongly agree and

agree, with only a small number expressing neutral, disagree, and strongly disagree perspectives.

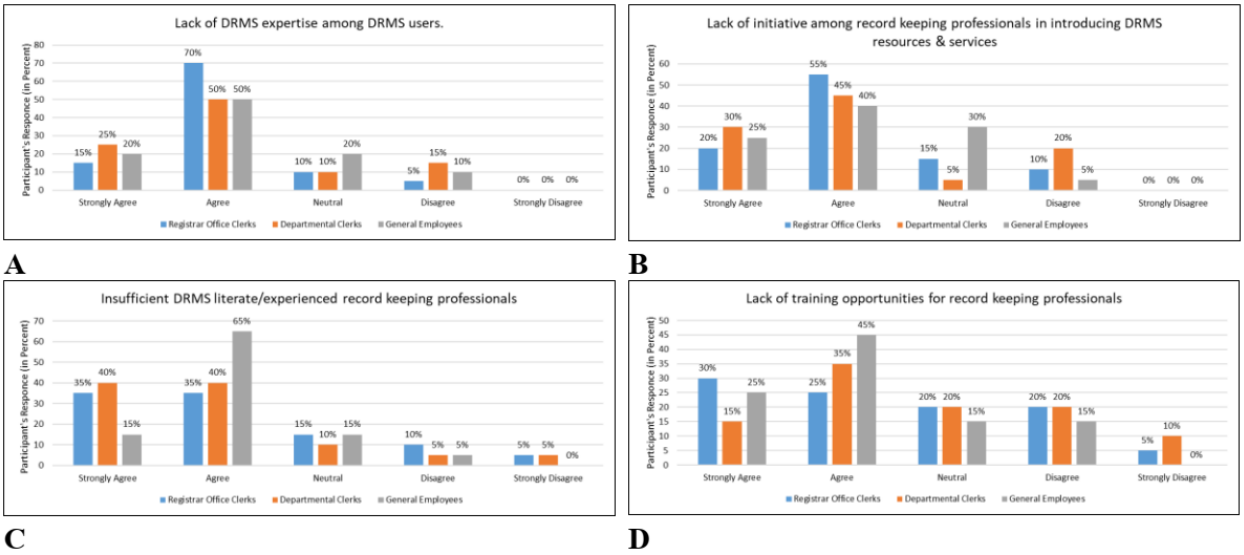

Figure 4. *Lack of expertise on Digital Record Management Systems*

3. Lack of Planning and Networking

A deficiency in planning and networking is illustrated, as evidenced by Figure 5, which presents participant responses to statement 9-12. The results in this section emphasize challenges arising from a lack of planning and networking. The majority of participant responses lean towards agreement and neutrality, while a subset express strongly agree, disagree, and strongly disagree. These responses are indicating the absence of a Digital Record Management Systems (DRMS) policy, along with insufficient cooperation and mutual understanding, poses significant barriers to the successful implementation of DRMS.

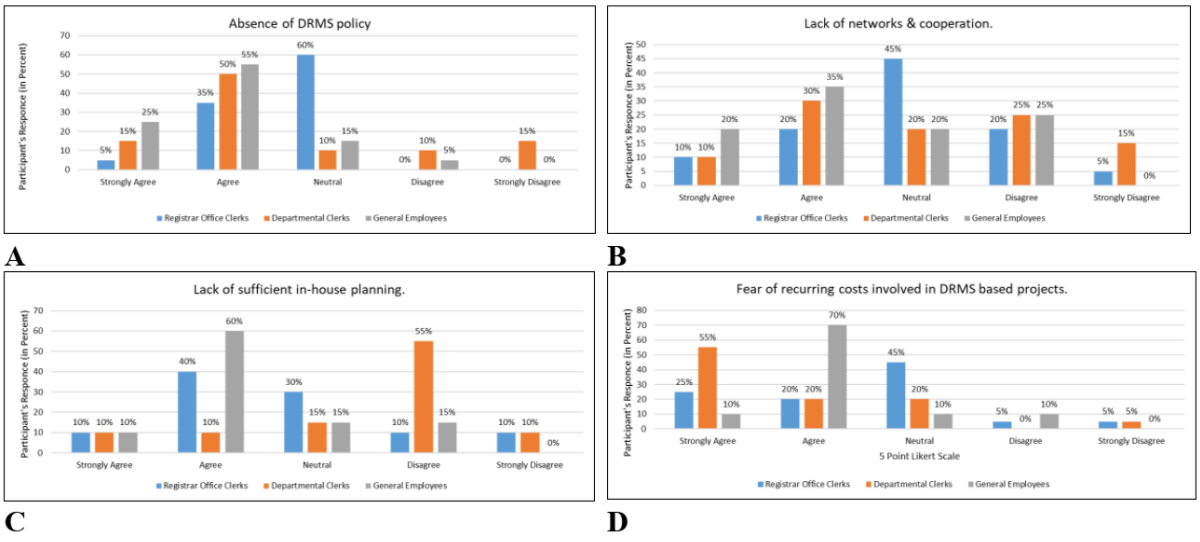

Figure 5. *Lack of Planning and Networking*

4. Technology Fear and Lack of Awareness of DRMS

Section 4 presented the issues of technology fear and lack of awareness on DRMS, as depicted in Figure 6, which showcased participant responses to statements 13 and 14. The outcomes in this section had emphasized challenges stemming from technology fear and a lack of awareness regarding DRMS. Participants had equally acknowledged a significant problem of computer hesitancy and technology fear among less computer-literate employees, which had been identified as a major factor contributing to the failure of such applications in public sector universities in Pakistan. As illustrated in Figure 6, the majority of participants had attempted to strongly disagree and agree, highlighting an alarming concern for the successful deployment of DRMS in public sector universities in Pakistan.

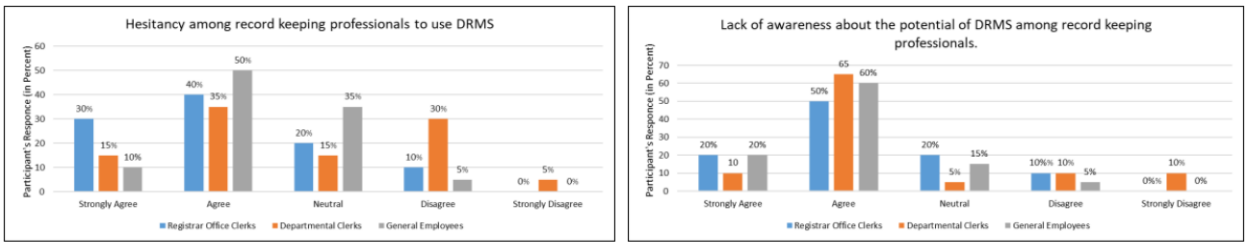

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Figure 6. *Technology Fear and Lack of Awareness of DRMS*

5. Technical Support

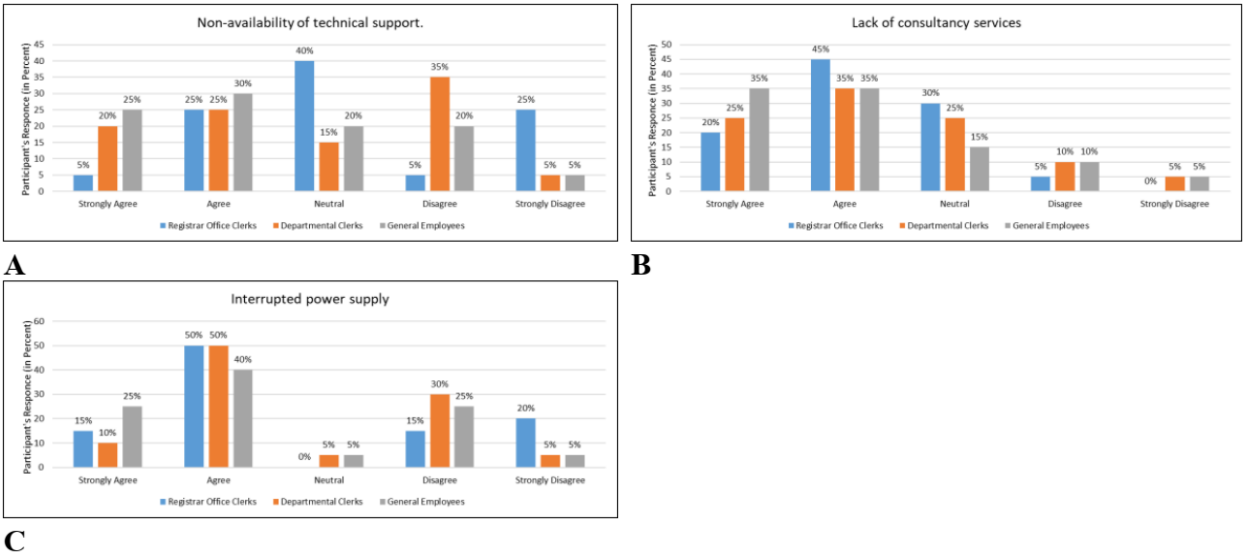

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Figure 7. *Technical Support*

Without any technical support, such system cannot be implemented in any organization. While observing the results in this section are surprising and show an alarming situation. Section 5 technical support highlights the crucial effects, Figure 7, which showcased participant responses from statements 15 to 17. The outcomes in this section had emphasized challenges for technical support regarding Digital Record Management Systems. Participants had

acknowledged a significant problem of technical support, which had been identified as one of the factors contributing to the failure of DRMS in public sector universities in Pakistan.

Top Five Issues in Implementing DRMS

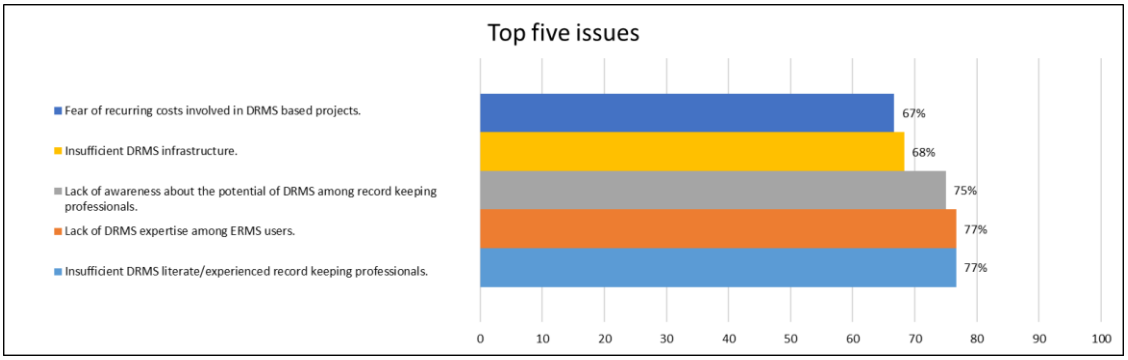

Figure 8. *Top Issues in Implementing DRMS*

For extracting meaningful results, the top five implementation issues were analyzed for the better understanding of problems. In Figure 8, which show that what factor are influencing in the implementation of fully automated systems. It seems, the fear of cost for DRMS installation, insufficient infrastructure, awareness about the advantages of DRMS, expertise on such systems, and insufficient DRMS professionals are the main factors which are becoming the barrier in deploying Record Management Systems in public sector universities in Pakistan.

Overall Response of the Participants Regarding DRMS Implementation Issues.

Examining various perspectives, the collective participant feedback was scrutinized to identify anticipated outcomes based on the gathered data. Figure 9 serves as the substantiation for this study, aiding in the discovery of barriers that impact the implementation of DRMS. Participant responses are predominantly observed as strongly agree and agree, with a limited number expressing neutral, disagree, and strongly disagree viewpoints.

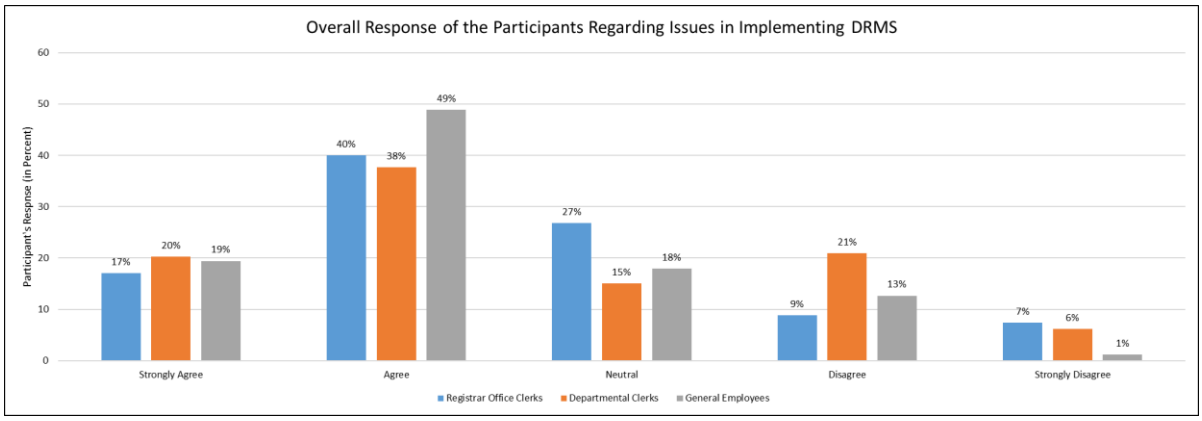

Figure 9. *Overall Response of the Participants*

ANOVA statistical method has been applied to the three groups of respondents (i.e., Registrar office clerks, Departmental clerks, and General employees). According to the results, [F (2,57) = 0.381, p=0.189] shows that there is no significant change among the participants of all groups. All three groups were facing all mentioned issues equally as shown in table 2.

Table 2. ANOVA Test Results for the DRMS Implementation Issues

ANOVA					
	Sum of Squares	**Df**	**Mean Square**	**F**	**Sig.**
Between Groups Within	.762	2	.381	1.716	.189
Groups	12.660	57	.222		
Total	13.423	59			

CONCLUSION

A thorough examination of diverse viewpoints involved scrutinizing the collective feedback from participants to identify expected outcomes based on the gathered data. This study identified five significant factors influencing the implementation of record-keeping software, which is essential for every public sector university in Pakistan to enhance their record-keeping practices and optimize resource utilization for organizational growth. The research revealed specific barriers affecting DRMS implementation and investigated participants' responses regarding the adoption of new technology for skill improvement, efficient resource utilization, personal development, a user-friendly work environment, and enhanced productivity.

RECOMMENDATIONS

Based on the findings, it is advised that public sector universities in Pakistan address this issue by considering in-house development or procuring a dedicated application for recordkeeping. Additionally, providing comprehensive training for employees is essential, along with establishing technical support mechanisms for effective DRMS management. Developers are encouraged to ensure that the DRMS incorporates engaging features, boasts an aesthetically pleasing design, and delivers accurate and reliable information about Record Management.

Moreover, this study utilized the Software Usability Measurement Inventory (SUMI) as an instrument tool to identify DRMS implementation issues, alternative assessment tools can also be used to evaluate these challenges. Furthermore, it is understood that each organization has unique challenges, expanding the scope of analysis to include a greater number of universities is recommended for a more comprehensive understanding of the issues.

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