Development of a Framework to Implement a Web-Based Thesis Management System in Colleges of Education in Nigeria

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ABSTRACT

This study investigates the challenges of the manual thesis management process in colleges of education in Nigeria and explores the potential benefits and barriers to adopting a web-based thesis management system. This study employed a mixed-methods research design and data were collected through questionnaire and interview. The findings highlight the need for automation to improve efficiency and consistency. Despite the identified advantages of a web-based system, such as streamlined processes, enhanced communication, and improved quality control, the study also uncovered significant barriers to adoption. These include underdeveloped IT infrastructure, limited human resources, high implementation costs, and resistance to change. The study emphasizes the importance of institutional readiness, with a focus on improving internet connectivity, expanding IT resources, and securing external funding to address financial constraints. A framework for adoption is proposed, encompassing key stages such as assessment and planning, technical requirements, training and support, and continuous monitoring and evaluation. The study concludes that a web-based thesis management system can greatly enhance the efficiency and quality of thesis processes if implemented with proper resource allocation, training, and long-term sustainability planning.

INTRODUCTION

The thesis writing process is a critical component of higher education, serving as the capstone of a student's academic journey and a demonstration of their ability to conduct independent research. In Nigerian colleges of education, the completion of a thesis is a mandatory requirement for obtaining the National Certificate of Education (NCE). This process is intended to foster students' research skills, critical thinking, and ability to engage with scholarly work. However, the current method of managing the thesis process in these institutions are often inefficient, cumbersome, and fraught with challenges.

Traditional thesis management in many educational institutions, including Nigerian colleges of education, relies heavily on manual processes. This approach is characterized by the physical submission of documents, face-to-face meetings between students and supervisors, and manual tracking of student progress. Several studies have highlighted the inefficiencies associated with these traditional methods. According to Essuman (2020), manual thesis management is often slow and cumbersome, leading to delays in feedback and communication between students and supervisors. This lack of timely interaction can impede the progress of thesis writing, resulting in extended timelines for thesis completion. Guto and Jumba (2021) also note that manual systems are prone to errors in record-keeping, such as misplaced documents and inaccuracies in tracking submission dates, which can lead to disputes and administrative challenges.

In Nigerian colleges of education, these issues are further exacerbated by the quality of students admitted and the limited availability of resources. The quality of students admitted into colleges of education in Nigeria has

been a subject of concern for policymakers, educators, and researchers (Birabil, & Ogeh, 2020). The entry qualifications for colleges of education in Nigeria tend to be lower than those for universities. This means that many students who are unable to gain admission into universities due to poor academic performance often choose colleges of education as a second or last resort.

The advancement of digital technologies has prompted many educational institutions globally to adopt web-based thesis management systems to address the challenges of traditional methods. A web-based thesis management system offers a centralized platform where all aspects of the thesis process, including submission, review, feedback, and approval, can be managed efficiently (Byungura, 2015). Research by Mudawe (2018) demonstrates that web-based systems can significantly streamline the thesis process by facilitating better communication between students and supervisors. These systems allow for the electronic submission of documents, real-time feedback, and progress tracking, which can reduce delays and improve the overall efficiency of the process. In another study conducted by Byungura (2015), the implementation of a web-based thesis management system in a university setting was shown to reduce the average time to thesis completion by 20%, highlighting the potential benefits of such systems in improving academic outcomes.

The implementation of a Web-Based Thesis Management System in colleges of education in Nigeria can address many of the challenges affecting the quality of theses produced by students (Paul *et al.*, 2022). The system can improve the academic readiness of students, promote better research practices, and enhance the overall quality of thesis submissions, by providing structured support,

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ensuring real-time supervision, and offering access to necessary research tools. Furthermore, web-based systems can provide students with easy centralized access to resources such as thesis writing guidelines, templates, and research tools. This centralized access ensures that all students have the necessary information to produce high-quality work and helps standardize the institution's thesis process (Maltese, 2018). Additionally, many web-based thesis management systems integrate with plagiarism detection tools, ensuring that the originality of student work is maintained (AlSallal *et al.*, 2019).

While the benefits of web-based thesis management systems are well-documented, there are also challenges associated with their implementation, particularly in the context of developing countries like Nigeria. One of the primary challenges is the technological infrastructure required to support such systems. Many colleges of education in Nigeria may lack the necessary IT infrastructure, including reliable internet access, servers, and technical support staff (Sagir, 2019).

Additionally, there is often resistance to change among faculty and students, who may be accustomed to traditional methods and wary of adopting new technologies. Kho, Gillespie, and Martin-Khan (2020) discuss the importance of change management strategies in successfully implementing web-based systems, including providing training and ongoing support to users. The study emphasizes that without proper training and clear communication of the benefits, the adoption of a web-based system may be slow, and its potential advantages may not be fully realized.

Financial constraints also pose a significant challenge. The development, deployment, and maintenance of a web-based thesis management system require significant investment, which may be difficult for institutions with limited budgets (Nyirenda, & Moyo, 2019). Institutions must carefully consider the cost-benefit ratio and explore funding opportunities or partnerships that could support the implementation of such systems.

The successful implementation of a web-based thesis management system requires careful planning and adherence to best practices. Several frameworks have been proposed in the literature to guide the development and deployment of these systems. One common framework involves a phased approach, starting with a needs assessment to identify the specific challenges and requirements of the institution (Chofreh *et al.*, 2018). This is followed by the design and development phase, where the system is tailored to meet the identified needs. Kho, Gillespie, and Martin-Khan (2020) recommend involving key stakeholders, including students, faculty, and IT staff, in the design process to ensure that the system is user-friendly and addresses the specific needs of all users.

The deployment phase should be accompanied by comprehensive training for all users, as well as the establishment of a help desk or support system to assist with any issues that arise during the transition. Kho *et al.* (2020) highlight the importance of pilot testing the system with a small group of users before full-scale deployment

to identify and resolve any technical or usability issues. Finally, the evaluation phase involves monitoring the system's performance and gathering feedback from users to make continuous improvements. Maltese (2018) suggests regular updates and enhancements to the system based on user feedback and technological advancements to ensure that it remains effective and relevant.

For Nigerian colleges of education, the adoption of a web-based thesis management system presents an opportunity to overcome the inefficiencies of traditional thesis management methods. By centralizing the thesis process and improving communication, such a system can help reduce delays, enhance the quality of student theses, and provide a more organized and transparent process. However, the successful implementation of this system requires careful consideration of the unique challenges faced by these institutions, including technological infrastructure, financial constraints, and resistance to change. By following best practices and adopting a structured framework for implementation, Nigerian colleges of education can maximize the benefits of a web-based thesis management system and improve the overall academic experience for both students and faculty.

Statement of the Problem

In academic institutions, the management of thesis submissions, reviews, and approvals is a critical but often cumbersome process. Traditionally, this process has been managed through manual, paper-based systems, leading to significant inefficiencies, delays, and errors (Chaputula, 2022). These outdated methods not only burden students, faculty, and administrators with unnecessary administrative tasks but also hinder the timely completion and quality assurance of academic work.

As the number of students and the volume of research output continue to grow, the limitations of manual thesis management systems have become increasingly apparent. Institutions face challenges in tracking the progress of thesis submissions, ensuring the timely provision of feedback, maintaining the security and integrity of academic work, and facilitating effective communication between students and their supervisors (Chaputula, 2022). These challenges are further exacerbated by the complexity of coordinating multiple stakeholders, including students, faculty, administrators, and external examiners, all of whom must collaborate effectively to ensure the success of the thesis process.

While web-based thesis management systems offer a promising solution to these challenges by streamlining the thesis process through digital automation, the adoption of such systems is not straightforward. Institutions often encounter significant barriers to successful adoption, including resistance to change, inadequate technical infrastructure, and a lack of integration with existing academic systems (Kho *et al.*, 2020). Furthermore, without a clear framework to guide the adoption process, institutions may struggle to implement these systems effectively, resulting in underutilization, user

dissatisfaction, and a failure to realize the full benefits of digital transformation.

Therefore, there is a critical need for a framework that addresses the unique challenges of adopting web-based thesis management systems in academic institutions.

Aim and Objectives of the Study

The primary aim of this thesis is to develop a framework for the adoption of a web-based thesis management system in colleges of education in Nigeria. To achieve the stated aim, the following specific objectives will guide the research:

1. To investigate the current thesis management practices in Nigerian colleges of education, identifying the key challenges and inefficiencies associated with traditional, manual processes.

2. To assess the technological capabilities and infrastructure of Nigerian colleges of education to determine their readiness for the implementation of a web-based thesis management system.

3. To develop a framework that outlines the key components, functionalities, and implementation steps necessary for deploying a web-based thesis management system in Nigerian colleges of education.

Research Questions

To guide the development of a framework for the adoption of web-based thesis management system in colleges of education in Nigeria, the following research questions were formulated:

1. What are the current thesis management practices in Nigerian colleges of education, and what challenges and inefficiencies are associated with these practices?

2. What are the technological capabilities and infrastructure available in Nigerian colleges of education, and how do they impact the readiness for implementing a web-based thesis management system?

3. What are the specific needs and requirements of students, supervisors, and administrative staff for a web-based thesis management system in Nigerian colleges of education?

4. What key components, functionalities, and steps should be included in a framework for the successful implementation of a web-based thesis management system in Nigerian colleges of education?

Research Methodology

This study employs a mixed-methods research design to capture a holistic view of the adoption process for web-based thesis management systems. The research is structured in two key phases and they are the exploratory phase and developmental phase. The exploratory phase is used to explore the current challenges, needs, and perceptions of stakeholders involved in thesis management and insights from the exploratory phase was used to develop a the framework. The purposive sampling technique was used to select participants to be interviewed. A self-structured questionnaire with a mix of Likert-scale and multiple-choice questions to collect quantitative data that identifies challenges, readiness levels and perceptions related to the adoption of a web-based thesis management system from students, lecturers, IT staff and administrators from the Federal College of Education (Special), Oyo. A stratified random sampling technique was used to select a sample for the survey. Data collected from the survey were used to draft questionnaires for the interview. The interview data collected were analyzed using thematic analysis themes, challenges, and strategies related to the adoption of the thesis management system. Atlas.ti was used to code and organise data, making it easier to identify patters and draw conclusion. The quantitative data were analysed using frequencies, means, and standard deviations.

RESULTS AND DISCUSSION:

Table 1: Demographic Role

Role		Frequency	Percentage
Valid			
	Student	150	68.2
	Lecturer	35	15.9
	IT Staff	15	6.8
	Administrator	20	9.1
	Total	220	100.0

Table 1 provided an overview of the demographic distribution of participants by their role. The majority of respondents were students, accounting for 68.2% (150 out of 220). Lecturers comprised 15.9% (35 respondents), while IT staff and administrators represented smaller portions, with 6.8% (15 respondents) and 9.1% (20 respondents), respectively. This indicated that the sample was predominantly composed of students.

Table 2: Demographic Gender of the Respondents

Role		Frequency	Percentage
Valid	Male	89	40.5
	Female	131	59.5
	Total	220	100.0

Table 2 illustrated the gender distribution among respondents. Out of the 220 total respondents, 89 (40.5%) were male, while 131 (59.5%) were female. This revealed that a greater proportion of the respondents were female.

Table 3: Years of Experience (For Lecturers, IT Staff, Administrators)

Year of Experience		Frequency	Percentage
Valid	Less than 1 Year	15	21.4
	1-5 Years	30	42.9
	6-10 Years	18	25.7
	More than 10 Years	7	10.2
	Total	70	100.0

Table 3 outlined the distribution of years of experience among lecturers, IT staff, and administrators. The data revealed that 21.4% of respondents have less than 1 year of experience, while 42.9% have between 1 and 5 years of experience. Experience level between 6 and 10 years was reported by 25.7% of respondents, and those with more than 10 years of experience constituted 10.2%.

Table 4: Demographic Age Group of Respondents

Age Group		Frequency	Percent	Cumulative Percent
Valid	Under 20	120	54.5	54.5
	21-30	52	23.6	78.2
	31-40	35	15.9	94.1
	41 and above	13	5.9	100.0
	Total	220	100.0	

Table 4 showed that the age demographic of over half of the respondents (54.5%) were under 20 years old, reflecting a significant concentration of younger individuals in the survey population. Those aged 21-30 made up 23.6%, while 15.9% were between 31 and 40 years old, and just 5.9% were 41 or older. This distribution indicated that the majority of the respondents were relatively young, with a substantial drop in representation among older age groups.

Research Question 1:
What are the current thesis management practices in Nigerian colleges of education, and what challenges and inefficiencies are associated with these practices?

Table 5: Are you aware of web-based system for managing thesis writing

		Frequency	Percentage
Valid	Yes	69	31.4
	No	151	68.6
	Total	220	100.0

Table 5 examined the level of awareness of web-based systems for managing thesis writing among a sample of 220 individuals. Of these, 69 respondents (31.4%) indicated they were aware of such systems, while 151 respondents (68.6%) were not. The standard deviation for the responses is 0.45, indicating a moderate level of variability in the level of awareness among the participants. This suggests that while a significant portion of the sample is unfamiliar with web-based thesis management tools, there is a noticeable subset that were aware of them.

Table 6: How do you perceive the idea of adopting a web-based thesis management system in your institution?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Negative	1	.5	.5	.5
	Somewhat Negative	26	11.8	11.8	12.3
	Somewhat Positive	146	66.4	66.4	78.6
	Very Positive	47	21.4	21.4	100.0
	Total	220	100.0	100.0	

Table 6 presented the perceptions of respondents regarding the adoption of a web-based thesis management system in their institution. The majority of respondents held a favorable view, with 66.4% perceiving the idea as somewhat positive and 21.4% as very positive, together accounting for 87.8% of the total responses. A smaller proportion, 11.8%, views the idea as somewhat negative, and only 0.5% holds a very negative perception.

Table 7: In your opinion, what are the major benefits of using a web-based thesis management system?

	Frequency	Percentage
Easier communication between students and supervisors	100	66.7
Better thesis organization	85	56.7
Faster feedback on thesis drafts	90	60.0
Improved access to research materials and tools	80	53.3
Plagiarism detection	45	30
Total Respondents	150	100

Table 7 presented respondents' opinions on the major benefits of using a web-based thesis management system. The most frequently cited advantage is easier communication between students and supervisors, noted by 66.7% of respondents. This is closely followed by faster feedback on thesis drafts, which 60.0% of respondents identified as a significant benefit. Additionally, 56.7% of participants valued better thesis organization, and 53.3% appreciated improved access to research materials and tools. Plagiarism detection was mentioned by 30% of respondents as a notable benefit. Overall, the data highlights that efficient communication and expedited feedback are the top advantages perceived by users, with other benefits such as organization and resource access also being recognized.

Table 8: What concerns do you have about adopting a web-based thesis management system?

	Frequency	Percentage
Cost of implementation	45	30.0
Technical difficulties for users	110	73.3
Lack of technical support	95	63.3
Resistance from lecturers or students	35	23.3
Data security and privacy concerns	90	60.0
Internet connectivity issues	140	93.3
Total Respondents	150	100.0

Table 8 outlined key concerns about adopting a web-based thesis management system among respondents. The most significant concern is internet connectivity issues, cited by 93.3% of respondents, reflecting the high dependence on stable internet access for such systems. Technical difficulties for users is also a major concern, reported by 73.3% of participants, indicating a potential barrier to effective system use. Lack of technical support and data security and privacy concerns are notable issues, with 63.3% and 60.0% of respondents expressing apprehension, respectively. The cost of implementation and resistance from lecturers or students are less prevalent concerns, reported by 30.0% and 23.3% of respondents.

Research Question 2:
What are the technological capabilities and infrastructure available in Nigerian colleges of education, and how do they impact the readiness for implementing a web-based thesis management system?

Table 9: How would you rate the current level of technological infrastructure at the college to support a web-based thesis management system?

		Frequency	Percentage
Valid	Very Inadequate	51	23.2
	Inadequate	124	56.4
	Adequate	45	20.5
	Total	220	100.0

Table 9 presented respondents' ratings of the current level of technological infrastructure at the college to support a web-based thesis management system. A majority of respondents, 124 out of 220 (56.4%), rated the infrastructure as inadequate. Additionally, 51 respondents (23.2%) considered it very inadequate, bringing the cumulative percentage of negative assessments to 79.5%. Only 45 respondents (20.5%) found the infrastructure "adequate, indicating a significant concern about the college's readiness to implement such a system.

Table 10: : Do you have access to a reliable internet connection at your institution?

Role		Frequency	Percentage
Valid	Never	153	69.5
	Rarely	67	30.5
	Total	220	100.0

Table 10 presented the distribution of responses regarding access to a reliable internet connection at the institution. According to the data, a significant majority of respondents, 69.5%, reported that they never had access to a reliable internet connection. In contrast, 30.5% of respondents indicated that they rarely had access reliable internet. This distribution highlighted a predominant issue with internet reliability, as most respondents experience consistent difficulties with their internet connection.

Table 11: How comfortable are you with using web-based systems and online Platforms?

		Frequency	Percentage
Valid	Very Uncomfortable	15	6.8
	Uncomfortable	37	16.8
	Comfortable	142	64.5
	Very Comfortable	26	11.8
	Total	220	100.0

Table 11 presented the distribution of comfort levels with using web-based systems and online platforms among respondents. The majority of respondents (64.5%) reported being comfortable with these systems, indicating a high level of familiarity and ease. A smaller proportion, 11.8%, felt very comfortable, suggesting a strong positive engagement with online platforms. Conversely, 16.8% of respondents were uncomfortable, and 6.8% were very uncomfortable, reflecting some degree of discomfort or challenges with these systems. This showed an overall positive attitude towards web-based systems and online platforms among the majority of participants.

Table 12: Has your institution provided any training related to online or web-based systems?

		Frequency	Percentage
Valid	No	64	29.1
	Yes	156	70.9
	Total	220	100.0

Table 12 presented the distribution of responses regarding whether institutions have provided training related to online or web-based systems. Out of the total 220 respondents, 64 individuals (29.1%) reported that their institutions had not provided such training, while 156 individuals (70.9%) confirmed that their institutions had indeed offered training in this area. This indicated that a majority of 70.9% had received training related

Table 13: If yes, how effective was the training?

		Frequency	Percentage
Valid	Very Ineffective	16	7.3
	Ineffective	163	74.1
	Effective	38	17.3
	very Effective	3	1.4
	Total	220	100.0

to online or web-based systems, suggesting a strong emphasis on digital competency within these institutions. Table 13 illustrated the perceived effectiveness of the training among participants. Of the 220 responses, 16 individuals (7.3%) rated the training as very ineffective, 163 (74.1%) deemed it ineffective, 38 (17.3%) considered it effective, and 3 (1.4%) rated it as very effective. This data indicated that the majority of participants found the training to be less effective, with only a small fraction expressing a positive evaluation.

Table 14: Are there IT staff available at your institution to provide support for technical issues related to a web-based thesis management system?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not available	98	44.5	44.5	44.5
	Available but with limitations	122	55.5	55.5	100.0
	Total	220	100.0	100.0	

Table 14 assessed the availability of IT staff for supporting technical issues related to a web-based thesis management system. The result revealed that 44.5% of respondents reported that IT staff were not available to provide such support, while 55.5% noted that IT staff were available but with limitations. This indicates that while a majority of institutions have some level of IT support, it is often constrained in its capacity. The table suggests that there may be challenges in fully addressing technical issues due to limited IT resources, highlighting the need for potentially increasing support staff or

enhancing their capabilities to better manage the web-based thesis management systems.

Research Question 3:

What are the specific needs and requirements of students, supervisors, and administrative staff for a web-based thesis management system in Nigerian colleges of education?

Challenges with Current Thesis Management

Table 15: What are the major challenges you face in the current thesis management process?

	Frequency	Percentage
Difficulty in scheduling meetings with supervisors	56	37.3
Delays in receiving feedback from supervisors	78	52.0
Poor thesis organization and progress tracking	90	60.0
Inconsistent access to research materials and resources	102	68.0
Plagiarism issues	45	30.0
Difficulty in formatting and organizing the final thesis document	110	73.3
Time management and deadlines	148	98.7
Lack of standardized process for thesis submission	150	100.0
Total Respondents	150	100.0

Table 15 revealed the major challenges faced by respondents in the thesis management process. The data reveals that the most prevalent issues are time management and deadlines, with 98.7% of respondents identifying it as a significant challenge. Additionally, a lack of standardized processes for thesis submission is highlighted by 100% of respondents, indicating a universal concern. Other notable challenges include difficulty in formatting and organizing the final thesis document (73.3%), inconsistent access to research materials and

resources (68.0%), and poor thesis organization and progress tracking (60.0%). Delays in receiving feedback from supervisors and difficulties in scheduling meetings are also significant concerns, affecting 52.0% and 37.3% of respondents, respectively. Plagiarism issues are less prevalent but still impact 30.0% of respondents.

Technical Challenges with Current Thesis Management

Table 16: Do you think a web-Based System would help address these challenges?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	19	8.6	8.6	8.6
	Yes	201	91.4	91.4	100.0
	Total	220	100.0	100.0	

Table 16 revealed the perceptions of respondents regarding the potential benefits of a web-based system in addressing technical challenges. The result shows that 8.6% of respondents believe a web-based system would not be helpful, while a substantial 91.4% think it would be beneficial. This strong majority indicates a broad consensus on the value of implementing a web-based solution to overcome existing challenges.

Table 17: Which features do you think are essential for a web-based thesis management system?

	Frequency	Percentage
Real-time feedback and communication	143	95.3
Thesis progress tracking	86	57.3
Automated formatting and submission workflows	74	49.3
Plagiarism detection tools	38	25.3
Repository of past theses for reference	120	80.0
Data analysis tools (e.g., SPSS integration)	32	21.3
Thesis Template	132	88.0
Total respondents	150	100.0
Total Respondents	150	100.0

Table 17 outlined the essential features for a web-based thesis management system as identified by respondents. Real-time feedback and communication emerged as the most crucial feature, with 95.3% of respondents highlighting its importance. Following this, 88.0% of respondents emphasized the need for a thesis template, and 80.0% found a repository of past theses for reference to be essential. Thesis progress tracking and automated formatting and submission workflows were also valued, with 57.3% and 49.3% of respondents respectively. Plagiarism detection tools and data analysis tools, such as SPSS integration, were considered less critical, with 25.3% and 21.3% of respondents respectively.

Research Question 4:

What key components, functionalities, and steps should be included in a framework for the successful implementation of a web-based thesis management system in Nigerian colleges of education?

Technical Challenges and Concerns (For IT Staff)

Table 18: Does your institution currently have the necessary hardware software infrastructure?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	10	66.7	66.7	66.7
	Yes	5	33.3	33.3	100.0
	Total	15	100.0	100.0	

Table 18 illustrated the status of hardware and software infrastructure across institutions. Of the 15 responses, 66.7% reported that the college lacks the necessary infrastructure, while 33.3% affirmed that they do have the required resources. This indicates a significant proportion of institutions facing infrastructure deficiencies.

Table 19: What are the key technical challenges your institution face in implementing a web-based management system?

	Frequency	Percentage
Lack of server	3	20.0
Poor internet bandwidth	8	53.3
Lack of technical staff for maintenance	6	40.0
Data security issues	5	33.3
High implementation costs	15	100.0
Software compatibility issues	8	53.3
Total respondents	15	100.0

Table 19 highlighted key technical challenges faced by institutions in implementing a web-based management system. Among the respondents, the most significant issue is high implementation costs, reported by all 15 respondents (100%). Poor internet bandwidth is also a major concern, affecting 53.3% of respondents, while software compatibility issues and lack of technical staff for maintenance each impact 53.3% and 40.0%, respectively. Data security issues are a challenge for 33.3% of respondents, and a lack of server is an issue for 20.0%. These findings indicated that while high costs are the predominant obstacle, other critical factors such as bandwidth, compatibility, and technical support also play substantial roles in the difficulties institutions face when adopting web-based management systems.

Table 20: Are you confident in your ability to support and maintain a web-based thesis management system?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Confident	11	73.3	73.3	73.3
	Very Confident	4	26.7	26.7	100.0
	Total	15	100.0	100.0	

Table 20 examined the confidence levels of individuals in their ability to support and maintain a web-based thesis management system. The data reveals that 73.3% of respondents are confident in their abilities, while 26.7% are very confident. This indicates a strong overall confidence in managing such systems, with a majority feeling adequately prepared to handle the associated tasks. The table also shows that there are no missing data points, providing a clear view of the respondents' confidence levels. This suggests that while most individuals feel capable, there is a smaller proportion who feel extremely confident, which may reflect varying levels of experience or preparedness among the staff.

Administrative Readiness (For Administrators)

Table 21: How ready is your institution for the adoption of a web-based thesis management system in terms of administrative processes?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Ready	20	100	100.0	100.0
	Total	20	100.0		

Table 21 presented results on the readiness of institutions to adopt a web-based thesis management system, focusing specifically on administrative processes. The data revealed that 100% of the respondents indicated that the college was ready for this adoption, reflecting a consensus that the administrative processes are adequately prepared for the transition.

Table 22: What are the administrative challenges you foresee in the implementation of this system?

	Frequency	Percentage
Resistance to change from faculty/Students	15	75.0
Lack of budget or funding	20	100.0
Lack of training for staff	10	50.0
Data security concerns	15	75.0
Integration with existing systems	10	50.0
Time constraints in implementation	18	90.0
Total respondents	20	100.0

Table 22 outlined the administrative challenges anticipated in the implementation of the new system. According to the data, the most significant concerns include lack of budget or funding, which is noted by all respondents (100%), and time constraints during implementation, highlighted by 90% of respondents. Resistance to change from faculty and students and data security concerns both affect 75% of respondents, while lack of training for staff and integration with existing systems are challenges for 50% of the respondents

Table 23: What are your top priorities for the successful adoption of a web-based thesis management system?

	Frequency	Percentage
Reducing administrative workload	20	100.0
Ensuring data security and privacy	12	60.0
Improving thesis quality and tracking	16	80.0
Providing adequate training for students and staff	12	60.0
Reducing delays in thesis submission and feedback	16	80.0
Total Respondents	20	100.0
Total respondents	20	100.0

Table 23 outlined the top priorities for the successful adoption of a web-based thesis management system among respondents. All respondents (100%) identified reducing administrative workload as a crucial priority. Ensuring data security and privacy, and providing adequate training for students and staff were each highlighted by 60% of respondents. Improving thesis quality and tracking, along with reducing delays in thesis submission and feedback, were considered important by 80% of respondents. These results emphasize that

while reducing administrative workload is universally prioritized, addressing data security, training, and minimizing delays are also critical factors for effective system implementation.

Table 24: How critical is the adoption of a web-based thesis management system to improving the overall thesis process in your institution?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Critical	18	8.2	8.2	8.2
	Slightly Critical	24	10.9	10.9	19.1
	Moderately Critical	86	39.1	39.1	58.2
	Very Critical	75	34.1	34.1	92.3
	Extremely Critical	17	7.7	7.7	100.0
	Total	220	100.0	100.0	

Table 24 evaluated the perceived criticality of adopting a web-based thesis management system for improving the thesis process at institutions. The data revealed a range of opinions, with 8.2% of respondents considering it not critical and 10.9% finding it slightly critical. A substantial 39.1% view the adoption as moderately critical, while 34.1% deem it very critical and 7.7% believe it to be extremely critical. This suggests that while there is varying intensity of opinion, a significant majority acknowledges the potential benefits of implementing a web-based thesis management system to enhance the overall thesis process.

Analysis from the interview
Current Thesis Management Process
Data collected from the respondents showed that the current manual process for thesis writing is faced by several challenges. Analysis of data showed that the system is faced with inefficient document tracking, leading to document misplacement. The reliance on physical submission also causes delays in communication between students and supervisors, leading to missed deadlines and frustration among students. Furthermore, the study also observed that there was inconsistent quality control in the current process. The process lack standardized formatting, evaluation criteria, and plagiarism detection tools has resulted in inconsistent thesis quality. This points to the need for automation and digital tracking through a web-based system, which could resolve these issues by centralizing all thesis-related activities and ensuring uniform quality standards across the institution.

Institutional Readiness for Adoption
The study observed that the college is partially ready for the adoption of a thesis management system, primarily due to the underdeveloped IT infrastructure and limited human resources. In the words of one of the respondents: "hmm, well, the college desires to adopt digital systems, but the college needs to acquire more IT equipment and employ more IT staff to fully implement web-based systems. In addition reliable internet connectivity is also required" However, with strong leadership support, and investment in IT infrastructure, readiness can improve. The college should address internet connectivity issues, as reliable internet access is critical for the effective deployment and use of a web-based thesis management system.

Perceived Benefits of the Web-Based Thesis Management System
All of the respondents perceived a web-based system as a solution to many of the problems faced by the college in thesis writing. They believe that automating the processes of manuscript submission, feedback and evaluation, will significantly enhance efficiency, reduce administrative work load and raise the overall quality of theses produced. Having real-time feedback mechanism in the thesis process will improve communication and collaboration between students and supervisors. One of the lecturers said that: The web-based system could facilitate online submissions, automated document tracking, and more efficient feedback, reducing delays and inefficiencies.

Another lecturer added that:
"The use of plagiarism detection tools and standardized template for the thesis report would improve the quality and consistency of thesis submissions. Let me add that the proposed thesis writing system will provide real-time feedback and notifications and would foster better communication between students and supervisors, helping to meet deadlines and improve accountability".

Potential Barriers to Adoption
The interview responses indicated high implementation cost, resistance to change and technical limitation as some of the barriers to the adoption of a web-based thesis management system. The barriers to adoption highlights the need for careful planning, in terms of resource allocation and change management. The problem of financial constraint can be addressed by seeking support from external funding or government. Resistance from both staff and students to shift away from the current process could be addressed through training programmes for both staff and students. The provision of adequate IT support of adequate IT support and reliable internet connectivity are crucial to overcome the technical challenges.

One of the administrator said that:
"One big problem would be fund. Getting that huge

sum of money for infrastructure, licensing, and ongoing maintenance will be very difficult, especially with limited budgets assigned to education. Apart from budget, resistance from both staff (particularly older lecturers) and students to shift away from manual processes could slow the adoption of the system".

Another administrator stated that: "poor internet access, insufficient server capacity, and limited IT staff are some of the challenges".

Budget and Resource Allocation

Budgetary concerns are a primary barrier, and securing government grants or other forms of external funding may be necessary for successful implementation. Investing in training and support is critical, as effective use of the system depends on the digital literacy of both staff and students. Allocating resources gradually through a phased rollout would ensure the institution can manage its resources efficiently while addressing issues at each stage of the implementation.

An administrator said that:

The main financial considerations include hardware and software investments, licensing fees, and ongoing maintenance costs. The college does not have a dedicated budget for this. Aside buying hardware and software, we also need to train the IT staff, lecturers and students to ensure the system is used effectively.

How do you plan to address these challenges?

To address the identified challenges in implementing a web-based management system, the administrators have outlined several key strategies. The majority of the administrators suggested intensive training programmes for both staff and students to enhance their proficiency with the new system. Additionally, they advised that the college seek additional funding or grants, particularly from TETFund and other sources, to support necessary IT upgrades. A phased adoption approach, beginning with pilot projects, is also planned to manage the transition more effectively. Finally, establishing robust data security protocols is a priority to ensure the protection of student and institutional data. These strategies reflect a comprehensive approach to overcoming the technical hurdles and ensuring a successful implementation of the web-based management system.

What additional features or functionalities would you suggest for a web-based thesis management system?

The majority of respondents suggest several key features for enhancing a web-based thesis management system. A significant number favor integrating the system with existing Learning Management Systems (LMS), which would streamline processes and improve accessibility. Automated deadline reminders for both students and supervisors are also highly recommended to ensure timely progress and adherence to schedules. Additionally, real-time collaborative editing features are considered essential, as they facilitate more effective and immediate communication between students and supervisors. These suggestions collectively aim to improve the system's functionality, user engagement, and overall efficiency in managing thesis work.

Any other comments or concerns regarding the adoption of a web-based thesis management system?

Respondents consistently emphasized the importance of ensuring long-term sustainability and scalability for the adoption of a web-based thesis management system. They highlighted the need for continuous monitoring and updates to keep the system aligned with technological advancements. This reflects a common concern that, for successful implementation and effective use, the system must not only meet current needs but also adapt to future developments and growing demands. Ensuring ongoing maintenance and upgrades is crucial for maintaining system performance and relevance over time.
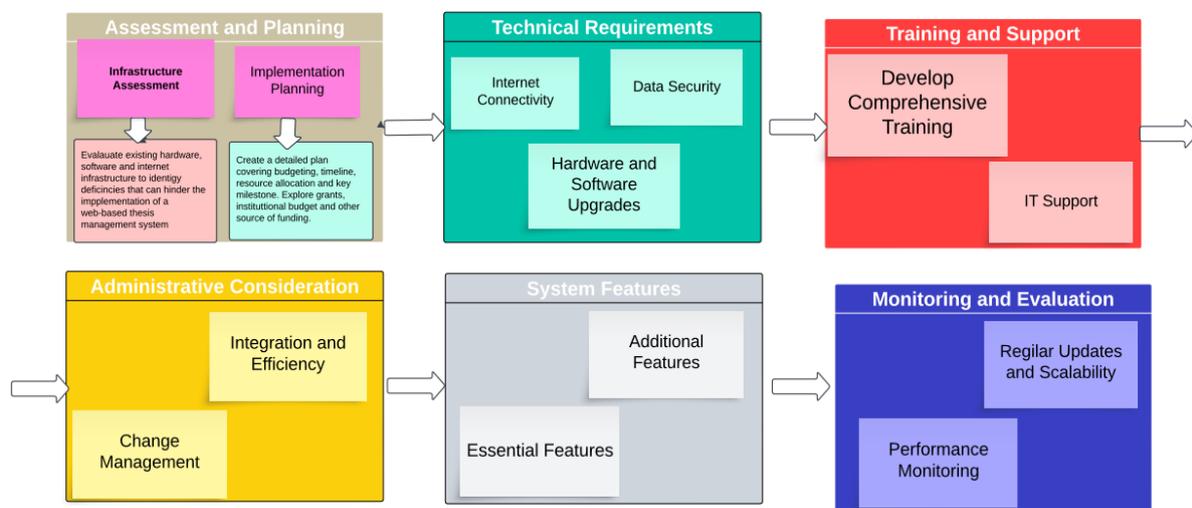

Figure 1: Framework for the adoption of thesis management system

Framework for the adoption of thesis management system

The framework was developed from the findings of the study. It effectively outlines the step-by-step process for adopting a web-based thesis management system while considering technical, operational and administrative aspects. It is divided into six interconnected sections, each addressing a critical aspect of the system's development and operation. The use of color coding helps distinguish between the different areas of focus. The framework uses arrows to depict the flow between these sections, indicating that each component is interdependent. The process starts with Assessment and Planning, moves through Technical Requirements, Training and Support, System Features, and concludes with Monitoring and Evaluation. Administrative Consideration runs in parallel to ensure alignment with organizational goals.

Discussion of the Framework
Assessment and Planning

a. Infrastructure Assessment: This step focuses on evaluating the current hardware, software, and internet infrastructure. The goal is to identify gaps that could impede the successful implementation of the thesis management system. This foundational analysis ensures that the institution is aware of any technical limitations and is prepared to address them.

b. Implementation Planning: Following the infrastructure assessment, a detailed plan is formulated, covering aspects such as budgeting, timelines, resource allocation, and milestone tracking. It also involves exploring funding options like grants and institutional budget allocations. This stage ensures that the project is strategically planned with clear objectives and timelines.

Technical Requirements

a. Internet Connectivity: Since the system is web-based, stable and reliable internet connectivity is critical. This ensures that all users, regardless of their location, can access and utilize the system efficiently.

b. Data Security: Protecting the sensitive information of students and faculty is a key concern. This element ensures that data is safeguarded through secure protocols, encryption, and compliance with privacy standards.

c. Hardware and Software Upgrades: This step emphasizes the need for any necessary upgrades to the existing infrastructure. This might involve enhancing the institution's hardware (e.g., servers) or software tools to support the new system's demands.

Training and Support

a. Develop Comprehensive Training: This component addresses the need to train all users, including faculty, students, and administrators, on how to navigate and use the thesis management system. A well-structured training program is vital for maximizing the efficiency of the system and minimizing user-related issues.

b. IT Support: The availability of ongoing technical support ensures that users can troubleshoot any problems they encounter. This helps to maintain the system's functionality and user satisfaction over time.

Administrative Consideration

a. Integration and Efficiency: The framework accounts for the system's seamless integration with the institution's existing administrative processes. This helps ensure that the system enhances, rather than disrupts, current workflows.

b. Change Management: As the introduction of a new system will likely require significant adjustments in workflows and user behaviors, managing change is crucial. This involves preparing stakeholders for the transition and mitigating any resistance to the new system.

System Features

a. Essential Features: These are the core functionalities that the thesis management system must possess to meet its primary objectives, such as document submission, progress tracking, and approval workflows.

b. Additional Features: These are supplementary features that can further enhance the system's capabilities, such as advanced analytics, integration with plagiarism detection tools, or collaboration features.

Monitoring and Evaluation

a. Regular Updates and Scalability: This element emphasizes the need for continuous updates to the system, ensuring that it remains compatible with evolving technologies and institutional needs. The system should also be scalable to handle an increasing number of users or additional functionalities in the future.

b. Performance Monitoring: Ongoing monitoring of the system's performance is essential for identifying issues and optimizing its efficiency. Metrics could include user satisfaction, system uptime, and speed of processing tasks.

CONCLUSION

A web-based thesis management system is capable of providing solutions to address problems confronting thesis writing in colleges of education in Nigeria and streamlined processes, improved thesis quality, and enhanced communication between students and supervisors. However, the adoption of such a system is dependent on the college's readiness in terms of IT infrastructure, resource availability, and internet connectivity. The study showed that while the college is keen to implement digital solutions, gaps in technology and limited IT resources remain significant barriers. The study also observed that financial constraints, resistance to change, and technical limitations can thwart the adoption process. These challenges can be addressed through planning, external funding, and robust training programmes for staff and students.

The perceived benefits of a web-based thesis management system are clear and they include automated

submission, feedback, and evaluation processes, enhanced efficiency, improved thesis quality through plagiarism detection and standardization, and better accountability and communication. However, these benefits must be weighed against the potential barriers, such as high implementation costs and resistance to change. The framework developed from the study outlines a comprehensive, step-by-step approach to adopting the system, emphasizing the need for thorough assessment, proper technical and administrative planning, continuous training, and long-term sustainability through regular updates and performance monitoring. The study concludes that with careful resource allocation, attention to training, and ongoing evaluation, a web-based thesis management system is not only feasible but necessary to modernize and improve the thesis management process across higher education institutions.

REFERENCES

AlSallal, M., Iqbal, R., Palade, V., Amin, S., & Chang, V. (2019). An integrated approach for intrinsic plagiarism detection. *Future Generation Computer Systems, 96,* 700-712.

Birabil, S. T., & Ogeh, O. W. M. (2020). Education in Nigeria: challenges and way forward. *International Journal of Academic Research and Reflection, 8*(1), 42-48.

Byungura, J. C. (2015). E-learning management system for thesis process support from a supervisor perspective: The case of SciPro System at University of Rwanda.

Chaputula, A. H. (2022). E-records management practices in public universities: A developing country perspective. *Records Management Journal, 32*(3), 213-230.

Chofreh, A. G., Goni, F. A., & Klemeš, J. J. (2018). Sustainable enterprise resource planning systems implementation: A framework development. *Journal of cleaner production, 198*, 1345-1354.

Essuman, J. (2020). *A Qualitative Exploration of Factors Causing Mphil Students' Delay in Completion of Thesis.* University of Cape Coast.

Guto, R., & Jumba, A. H. (2021). Relationship between electronic records management and public organization credibility: Critical analysis of literature review. *Journal of African Interdisciplinary Studies, 5*(3), 52-67.

Kho, J., Gillespie, N., & Martin-Khan, M. (2020). A systematic scoping review of change management practices used for telemedicine service implementations. *BMC health services research, 20*, 1-16.

Maltese, V. (2018). Digital transformation challenges for universities: Ensuring information consistency across digital services. *Cataloging & Classification Quarterly, 56*(7), 592-606.

Mudawe, O. M. N. (2018). Google docs: potentials and promises for scaffolding supervisory pedagogical practices of EFL/ESL students' writing dissertation. *Journal of Applied Linguistics and Language Research, 5*(2), 192-206.

Nyirenda, M., & Moyo, S. (2019). Development of research administration and management system for higher education institutions in developing countries: case study of Durban university of technology. *The African Journal of Information Systems, 11*(3), 3.

Paul, R. U., Mbeledogu, N. N., Sunday, B. T., Emmanuel, M. C., & Nwokoye, C. (2022). A Web-based Information Management System for Educational Institutions in Riverine Areas. *Acta Scientific Computer Sciences, 4*(4), 31-40.

Sagir, M. A. (2019). Strategic approaches to address the challenges faced in using electronic document management system: a case of staff of Kebbi State University of science and Technology Aliero, Nigeria