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ACADEMIC RECORDS MANAGEMENT PRACTICES IN AFRICA HIGHER EDUCATION INSTITUTIONS: EMPIRICAL REVIEW

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ABSTRACT: *Students' academic records encompass all academic information related to individuals, maintained in various formats and media by educational institutions. Effective management of these records is crucial for the success of higher education institutions. This review examines the management of academic records in colleges and universities across Africa, with the aim of evaluating current practices. The scoping review method was employed to gather and analyze empirical studies from 15 African countries, published between 2001 and 2024. A total of 65 studies were reviewed, focusing on four main themes: (1) practices and processes of academic records management in African higher education institutions; (2) the efficiency and effectiveness of digital academic records management; (3) the challenges faced by these institutions in implementing and maintaining digital record systems; and (4) measures taken to ensure the integrity, privacy, and security of students' records in digital formats. The findings indicate that while many African higher education institutions have developed robust systems for managing academic records, these systems are not always fully aligned with institutional policies. Furthermore, institutions that have established records management policies often encounter challenges in effectively implementing the processes outlined in these policies. The findings also highlight that the adoption and effective management of digital record systems can significantly enhance the overall efficiency of academic records management. However, challenges such as inadequate IT infrastructure, lack of digital skills, resistance to change, and security threats hinder the smooth adoption of digital systems. The absence of clear policies, strategic planning, and integrated systems further complicates efforts to achieve successful digital transformation in these institutions. Additionally, the review underscores that African higher education authorities are taking proactive measures to protect students' academic records, including the implementation of blockchain technology, credential-based authentication, and security frameworks such as the PIEM model. Key practices, such as conducting risk assessments and employing robust encryption techniques, are identified as essential for safeguarding sensitive student information. This study advocates for higher education institutions to develop clear and comprehensive records management policies that address both manual and digital processes. These policies should establish standards for the creation, storage, retrieval, disposal, and security of records, alongside a system for regular review and continuous improvement.*

KEYWORDS: Academic Records; Higher education Institutions; Digital Academic Records; Records Management.

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INTRODUCTION

Managing students' academic records is a crucial aspect of higher education institutions' service delivery, serving as the foundation for maintaining accurate and trustworthy documentation of students (Borah, 2020). The processes involved in academic records management encompass the organized creation, maintenance, storage, retrieval, and disposal of records. These processes ensure compliance with regulatory standards and enhance the operational efficiency of institutions (Smith & Brown, 2019). As higher education institutions undergo transformation, managing these records has become increasingly fundamental, especially with the growing student population, advancements in technology, and the need for data-driven decision-making in administration (Chen et al., 2021). Colleges and universities depend on effective academic records management to facilitate numerous functions, such as admissions, registration, academic advising, curriculum development, graduations, and alumni relations (Jones, 2018). Well-maintained records are essential for fostering transparency, accountability, and credibility, all of which are key to meeting accreditation requirements and building trust with stakeholders (Kumar & Singh, 2020). Additionally, protecting academic records is vital for securing sensitive student information and upholding privacy (Patel, 2022; Yidana et al., 2023).

In recent years, there has been a noticeable shift from traditional paper-based record systems to digital platforms. While this transition offers various benefits, it also presents challenges for educational institutions. On one hand, digital record management improves accessibility, streamlines workflows, and enables better integration of data across different departments (Nguyen et al., 2020). On the other hand, it requires substantial investment in technology, staff training, and cybersecurity measures to address risks such as data breaches and system failures (Anderson & Lee, 2021). Research has investigated different aspects of academic records management, such as technology adoption, the influence of regulatory frameworks, and the efficiency of current practices (Rahman & Ahmad, 2019; Yidana et al., 2023). These studies indicate that, although many institutions are progressing toward modernization, gaps remain in areas such as staff skill levels, resource distribution, and adherence to best practices (Taylor et al., 2022). The growth of global education and cross-border mobility further underscores the need for standardizing records management practices to ensure the smooth transfer of academic credentials and transcripts (World Education Forum, 2021). It appears that no study has yet comprehensively reviewed academic records management practices in higher education institutions.

Given the apparent absence of a comprehensive review of students' academic records management processes in African higher education institutions, this empirical review aims to assess the current landscape of academic records management, identify challenges and opportunities, and offer evidence-based recommendations for enhancing efficiency and effectiveness. By synthesizing insights from existing literature and case studies, this research seeks to contribute to the development of robust academic records management systems that meet the evolving demands of educational institutions in the 21st century. The review provides valuable insights into the strengths and weaknesses of current academic records management practices in African institutions. It highlights inefficiencies, inconsistencies, and errors in the way records are handled, stored, and retrieved. By identifying areas in need of improvement, higher education institutions

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can enhance their record management systems, bolster data security, and improve the services they provide to students.

Purpose of the Study

The study sought to determine the current state of academic records management practices in higher educational institutions.

Research Questions

1. What practices and processes are involved in academic records management within higher educational institutions?
2. To what extent has the transition from paper-based to digital records management systems affected the efficiency and effectiveness of students' academic records management?
3. What challenges do higher education institutions face in implementing and maintaining students' digital academic records management systems?
4. What measures are being put in place by higher education institutions to safeguard the integrity, privacy and security of students' academic records in digital systems?

THEORETICAL FRAMEWORK OF THE STUDY

In higher education institutions (HEIs), managing academic records is crucial for ensuring that student and institutional records are preserved, accessible, and maintained with integrity over time. This research takes an empirical approach using the records continuum theory to explore how these records are managed in HEIs. The records continuum theory (RCT) provides a robust framework for understanding records management practices, especially given the increasing complexities in recordkeeping due to technological advancements. The theory highlights the importance of collective memory, managing both organizational and personal memories for future generations, and how records evolve through transactions and processes, along with the ways they are documented visually (Muthoni, 2018). Myburgh (2005) describes it as a philosophical shift that effectively ties records management with the responsibilities of archivists, emphasizing the interconnectedness of these roles. The continuum model focuses on the management of records throughout their lifecycle, rather than simply their creation or duration, which, as Dodge (1997) notes, does not adhere to a specific "time" or "place."

The application of the records continuum theory helped the researcher to analyse the growing complexities of change, innovation, and the varied nature of records resulting from technological progress. Again, the theoretical framework is applied in the empirical review to analyze how academic records are created, managed, and archived in educational settings. The study aimed to highlight the pivotal roles that records managers and archivists play in the processes surrounding the creation, editing, management, and archiving of students' academic records, while also identifying the challenges and opportunities present in their work. Academic records, which

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capture faculty contributions, administrative decisions, and students' educational paths, serve as a repository of institutional memory. By applying RCT, we can better grasp how records remain accessible and relevant even after their initial administrative use.

In today's intricate recordkeeping and archiving landscape, this theory has been increasingly recognized as an effective one, the best theory in studies on records management (Weller, 2017). Whether records are a few minutes old or a thousand years old, the continuum approach has relevance. When it comes to paper and digital records, this framework supports shared understandings, consistent standards, unified best practices, multidisciplinary approaches, and collaborative efforts. Evidence suggests that institutions adopting digital technologies aligned with RCT principles achieve better security, authenticity, and long-term record preservation (Katuu, 2020).

MATERIAL AND METHODS

The study used the qualitative research approach (i.e., content analysis of documents through literature review). By using this approach, the researcher was able to thoroughly scrutinize past related literature and documents relevant to the topic, which is not possible in quantitative research. The method that was adopted in the review process was the scoping review method. The aim of adopting this method was to have a wide-ranging and thorough strategy for examining the literature that swiftly connects the major variables and key phrases driving the review to the important sources of the literature.

Content analysis was used to identify the key themes or structures resonating throughout the body of literature available, and compare and integrate data from prior research (Kibuku et al., 2020). Stepanyan, Littlejohn and Margarita (2013) contend that the scoping review helps analyze trends in a contemporary field, such as online teaching and learning, where ideas are still developing. The review was guided by research questions in line with the recommendations of Arksey and O'Malley (2005) who contend that researchers need to identify and formulate research questions, identify relevant studies in line with the purpose of the study, study selection, data collection, summary and synthesis of results and consultation. The research questions on page 2 guided the search.

The researcher reviewed empirical studies related academic records management in African higher education institutions. Two electronic databases – Educational Resources Information Center (ERIC) and Google Scholar – were searched with the keywords presented in Table 1 combined with the Boolean operator, "AND". The search was undertaken between the 29th of December, 2024 and the 15th of February, 2025 to identify research that was conducted on academic records management practices in higher education institutions. The duration defined for the search was January 2001 to February 2024. The first search (ERIC) yielded 85 articles, and the second (Google) showed 87 articles. The intention was not necessarily to lump the findings together but rather to establish a trend concerning the challenges of online teaching and learning in African higher education institutions.

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The ERIC articles were reviewed, with special emphasis made on the relevance of the topics, methodology, and conclusions; this approach decreased the number of articles to 47. After going through all of the publications, 5 were judged to be irrelevant: some dealt with records management generally but did delve into academic records in a higher education context, while others evaluated available infrastructure to support records management in universities. Furthermore, 2 items could not be found. As a result, the number of ERIC articles that were eligible was reduced to 40. Applying the same procedure for 87 articles obtained from Google Scholar, only 25 articles were found to be relevant and to meet the criteria after duplicate articles were removed from those obtained from ERIC.

Inclusion and Exclusion Criteria

The criteria that were used in selecting the articles included:

1) The study must have been about academic records management practices;

2) The study focus must have been higher education institution context;

3) The study setting must have been Africa;

4) The period of the study must have been between 2001 and 2024;

5) The study's participants had to be students, teachers, administrators, or other

school staff.

A total of 65 research articles were identified to be relevant and were further evaluated for content analysis. The review followed the steps of the scoping review approach as stipulated by Arksey and O'Malley (2005) and summarized the results of every step as shown in Table 1.

Table 1: The Scoping Review Process

Activity	Outcome
Identify research questions	1. What practices and processes are involved in academic records management within higher educational institutions? 2. How has the transition from paper-based to digital records management systems impacted the efficiency and effectiveness of academic records management? 3. What are the primary challenges faced by educational institutions in implementing and maintaining modern academic records management systems? 4. What measures are being taken to ensure the privacy and security of academic records in digital systems?

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Find relevant terms by identifying key phrases and using them.	The key terms that were used for the primary search materials are as follows: 1. Academic records creation in higher education institutions. 2. Academic records management and retrieval in higher education institutions. 3. Steps and processes for managing academic records in higher education institutions. 4. Effect of digitization on efficiency and effectiveness of academic records management in higher education. 5. Effectiveness and efficiency of digital records management in higher education. 6. Modern Academic records management limitations and successes. 7. Advantages and disadvantages of modern digital records management in higher education institutions. 8. Weaknesses of digital academic records management. teaching and Depending on the outcome of the initial search, a secondary search was conducted, with the following findings: 1. Academic records management practices in African higher education 2. The influence of digitisation on the efficiency and effectiveness of academic records management. 3. African higher education institutions' Readiness for digital academic records management 4. Challenges of implementing digital records in African Higher Education Institutions. 5. Privacy and security of academic records in digital systems 6. Effectiveness of academic records management: students' perceptions. 7. Infrastructure issues facing higher education academic records management.
Select the related studies	1. 87 research papers were obtained from google scholar

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	2. 85 research papers were obtained from ERIC.
Screening	After screening the following number of research works were found relevant: 1. 25 relevant research papers from google scholar 2. 40 relevant research papers from ERIC.
2. Extracting the major themes and constructs	The major themes that were running through the available literature include: 1. Academic records management practices and procedures 2. Effect of digitization on efficiency and effectiveness of academic records management in HEIs 3. Challenges concerning the adoption of digitization in the management of academic records 4. Measures for safeguarding the security of students' academic records.

RESULTS AND DISCUSSION

The results of the empirical review are presented by research questions as stated below.

Practices and Procedures in Students' Academic Records Management

Students' academic records are a vital component of the records kept by higher education institutions. This research set out to examine the different practices and methods used to manage these records within such institutions. A review of the literature shows that most higher education institutions tend to follow comparable processes for handling academic records. While many of these practices are detailed in the institutions' records management policies, some are based on informal customs and traditions that are not necessarily written down as formal policies.

Smith and Brown (2019) identified several key practices essential to managing academic records. These include the systematic creation, maintenance, storage, retrieval, and disposal of records, while ensuring compliance with regulatory standards and promoting operational efficiency. Bigirimana et al. (2015), assessed the effectiveness of electronic records management at an African university. The authors found that effective academic records management encompassed proper creation, storage, distribution, usage, securing backups, and implementing disaster recovery systems. Similarly, Abdulrahaman (2015) investigated records management for university administration in North Central Nigeria. The findings revealed that the primary filing systems used were alphabetic and subject-based. Moreover, tasks such as record creation, retrieval, scheduling, filing, correspondence management, and disposal were performed manually. In the same vein,

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Dasmani (2019) carried out a comparative analysis of records management practices in public versus private universities, concluding that the key components of a records management policy framework should cover records creation and capture, surveys/audits of records, records analysis, retention schedules, record disposal, protection and security, as well as providing proper training for staff. Other studies (Adu, 2014; Seniwoliba et al., 2017; Momoti & King, 2019) reported similar findings regarding procedures and processes.

The review shows that while many universities in Africa tend to have laid down processes in place for managing academic records, many of these practices do not seem to be properly reflected in their policies. Momoti and King (2019) conducted a study on how student academic records are maintained at the University of Western Cape and found that records management was not fully aligned with other operational activities. The authors noted that this lack of integration hindered effective management of students' academic records and consequently limited the institution from fulfilling their goals. They concluded that lack of dedicated records management strategy hindered accountability, transparency, and governance within these institutions. A study by Seniwoliba, Mahama, and Abilla (2017) further revealed that most records management practices in higher education are not incorporated into the overall corporate strategy of their universities. They suggested that these practices need to be part of broad strategic initiatives across the university. This idea is echoed by Musembe (2016), who suggests that integration of records management strategies within the university's framework indicates the university management's commitment to enhancing these programs. Vanwyk and Du Toit (2016) pointed out that lacking an integrated records management strategy poses a risk for universities in developing nations, indicating that university executives must actively support the records management policy. Giba-Fosu (2020) also noted that African universities have not documented their records management programs as thoroughly as their counterparts in developed countries. Additionally, Muchaonyerwa and Khayundi (2014) discovered that many African universities are missing cohesive records management strategies. In his research on records management practices in Kenyan higher education, Musembe (2016) found that these universities often lacked clear records management policies. He recommended that comprehensive records management programs should be developed and put in place, emphasizing clear policies, necessary infrastructure, staffing guidelines, and qualifications for records personnel.

Academic record management policies, practices, and traditions all play a role in shaping the overall management framework, which covers aspects like creating, maintaining, storing, retrieving, and disposing of records. These processes must comply with regulatory standards to maintain operational efficiency. As evidenced by the findings, while many African higher education institutions have robust practices for managing records, they often fall short of fully integrating these practices into their institutional policies. Without a strategic alignment of records management with other university functions, its effectiveness in supporting broader organizational goals is compromised. To truly enhance accountability, governance, and operational efficiency, records management needs to be woven into the wider strategic initiatives of universities. For real progress, institutions should develop clear and integrated records management strategies, backed by the right policies, infrastructure, and skilled personnel. This approach will not only enhance records management but will also promote greater transparency and accountability within African higher education.

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The review findings further suggest that while some higher education institutions in Africa have academic records management policies, they do not effectively implement the practices and processes outlined in these policies. Research by Phiri (2015), which investigated the management of university academic records in South Africa and Malawi, found that some institutions do not effectively leverage their governance structures and other record-keeping drivers to establish robust systems. The study concluded that key factors influencing record-keeping ability include having a solid records management policy, the capacity to handle digital records, the presence of a dedicated records management unit, senior management backing, and effective training systems for storage, retrieval, and proper disposition of records. This points to a clear distinction between having an academic records management policy and actually implementing the necessary structures to make it effective. Some universities struggle with policy implementation due to a lack of these structured supports. In another investigation into the roll-out of records management services for student registration—a critical step in planned academic records digitization—Falolo et al. (2022) observed a failure to comply with enrolment timelines and admission criteria. Additionally, Singo and Makgahlela (2024) confirmed the presence of academic records management policies but noted that these policies were applied inconsistently across various university departments and units. The findings indicated discrepancies in both the physical and digital recording and storage processes, as well as in the training provided to personnel working with records. These studies underscore the urgency in formalizing procedures, especially for electronic records management, while emphasizing the importance of ongoing staff training and the creation of comprehensive disaster recovery systems.

Two (2) major modes of storing students' academic records have also been identified. These include the electronic and the manual modes. In a study to determine students' academic records management practices in the Registrar's Office, Metto (2021) found that there were two clear ways of storing students' records. Nevertheless, the adoption of electronic records management according to him "was fifty-fifty," suggesting that both electronic and manual management were the two modes of keeping students' academic records. The study concluded that though most of the universities had some form of electronic document use, some had not fully embraced electronic management due to an apparent lack of policy guidelines. Another study conducted by Adu (2014) on the assessment of records management practices among the administrative staff of the University of Education, Winneba revealed that the administrative documents were stored in both manual and electronic forms. In the same vein, Seniwoliba et al. (2017) conducted a study on the challenges of records management in higher education in Ghana. The study revealed that records management was decentralized and was managed manually through the filing of hardcopies in folders and kept in metal cabinets based on individual ability and knowledge at the various departments and faculties. It was further affirmed that only the academic affairs and finance sections had a well-developed software system to store and retrieve information. The study identified "poor shape in which the university records were managed and this was attributed to a lack of training on how to handle manage and retrieve records in the university. While acknowledging the significance of maintaining both electronic and hard copies of students' academic records, some African higher education institutions are making giant steps towards embracing the digital age and adopting electronic means of keeping students' academic records since electronic data can be accessed everywhere.

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The Impact of Digital Records Management Systems on the Efficiency and Effectiveness of Academic Records Management

A student's academic records contain information directly related to an individual student, which is stored in various digital formats and media by academic institutions during their study period. This study, among others, aimed to determine the impact of digital records management systems on the efficiency and effectiveness of academic records in higher education institutions. The results suggest a significant positive impact of digital records management systems on the efficiency and effectiveness of academic records management.

Ochwo, Atibuni, and Sekiwu (2018) investigated the efficacy of information and communication technology (ICT) in the digital management of student records in universities in Eastern Uganda. Their findings revealed that the level of ICT adoption and digitalized student records management in these universities was generally moderately high. They further found that an increase in the level of ICT adoption was associated with a higher effectiveness in digital student records management and vice versa. The authors recommended that university management should procure sufficient ICT equipment, such as computers, for staff to enhance effective digitalized student records management. They also emphasized the importance of ongoing training needs assessments and continuous professional development for staff to stay abreast of technological changes in student records management.

Bigirimana et al. (2015) assessed the effectiveness of electronic records management, considering factors such as the creation, storage, distribution, use, security, backups, and disaster recovery procedures for electronic records. The findings suggest a significant positive effect of digital record keeping on the overall academic record management of the universities. Similarly, Bosu (2019) examined the use of ICT in administrative activities in higher education institutions in Ghana. Her findings revealed that the use of ICT had fundamentally transformed the majority of administrative practices and procedures. The administrators agreed that technology is an essential part of their work, playing a critical role in positively impacting the quality of their work, including student academic record keeping. It was recommended that higher education institutions (HEIs) continually raise awareness of the benefits of ICT use, adopt strategic plans committed to ICT integration, provide adequate training based on identified needs, and ensure the availability of the necessary ICT tools and facilities.

According to Nawusu et al. (2024), computerized academic record systems effectively maintain student records on "electronic storage media that can easily be accessed or modified." These systems are designed to provide students, instructors, administrators, and sometimes parents, with various access credentials to search for and retrieve academic and personal data. Somani (2020) explained that the goal of these systems is to develop a student body that is well-informed about their academic progress, enabling them to follow directions and ask relevant questions about their academic lives. By providing students with these tools, institutions foster their active participation in their personal growth and strengthen the bond between them and the university.

Baiden et al. (2023) noted that management information systems (MIS) used to manage student academic records provide educators and administrators with the data needed for informed

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planning, policymaking, and assessment. The authors reveal that MIS has effectively transformed university administration in areas such as leadership, decision-making, workload management, human resource management, communication, responsibility, and planning. University management uses MIS tools to set institutional goals, create strategic plans, allocate resources, and evaluate employee performance and organizational success. MIS systems improve site and district management, empower staff at all levels, and enhance a school or district's accountability to the community. This has contributed to the growing interest in MIS and the trend toward strategic, long-term planning for MIS implementation.

The adoption and effective management of digital record systems in higher education institutions have shown significant benefits in enhancing the efficiency and effectiveness of academic records management. As evidenced by various studies, including those by Ochwo, Atibuni, and Sekiwu (2018), and Bosu (2019), ICT integration in administrative and academic record-keeping processes has become crucial for transforming traditional practices and improving overall institutional effectiveness. The findings highlight the importance of continuous staff training, investment in adequate ICT infrastructure, and strategic planning to fully leverage the potential of digital systems. Furthermore, systems like computerized academic records and management information systems (MIS) not only streamline data access and retrieval but also foster greater student engagement and institutional accountability. As the role of technology continues to evolve, higher education institutions must prioritize the ongoing development of digital records management to support academic and administrative functions, ensuring their long-term sustainability and effectiveness in an increasingly digital world.

Challenges Faced by HEIs in Implementing and Maintaining Modern Academic Records Management Systems

The adoption of modern academic record systems has made a significant difference in how higher education institutions (HEIs) manage students' academic records. However, despite the advantages these systems offer, there are still hurdles that affect their effective implementation. This review looks at the challenges HEIs face when it comes to putting in place and maintaining modern academic record systems.

Musembe (2016) studied record management practices at universities in Kenya and found that there were no clear policies in place for managing academic records, which are essential for successfully adopting digital record management. Similarly, Luambano and Mwantimwa (2023) explored the use of electronic systems in Tanzanian higher education institutions. Their research indicated that e-records management systems were not being utilized effectively to enhance records management, citing various human, organizational, technological, and regulatory challenges. They emphasized that collaboration between institutional management and record management professionals is crucial for effective e-records implementation.

Oriji and Nnabuo (2025) examined digital technology applications in Nigerian higher education and pointed out that digital illiteracy is a major roadblock to effectively implementing and maintaining digital academic records. This issue stems from insufficient ICT skills among academic staff and a general lack of knowledge and expertise among both academic and

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administrative staff. Additionally, students and staff are often not well-versed in the digital services available to them. Digital transformation has changed the way learning is conducted and the tools used to support that learning, necessitating new skills and knowledge (Aditya, Ferdiana & Kusumawardani, 2021). Consequently, administrative staff who are not familiar with digital technologies struggle to leverage new tools for managing academic records (Kopp, Gröblinger & Adams, 2019). The success of digital transformation in HEIs is closely linked to the skills and understanding of both faculty and students (Marks et al., 2020). Moreover, there is a noticeable generational divide, with students often seen as "digital natives" while faculty members must adapt to learning how to use these technologies.

Gkrimpizi et al. (2023) assessed the barriers to digital transformation within Higher Education Institutions and found that fear of risk and reluctance to change hinder full adoption of digital academic record management. People in academic settings tend to stick to what they know and are comfortable with (Gkrimpizi & Peristeras, 2022). Changing the academic culture is a slow and challenging endeavor, and weak interpersonal relationships typical in academic environments make cultural shifts even harder (Aditya, Ferdiana & Kusumawardani, n.d.). Several noted barriers to digital transformation include anxiety, uncertainty, resistance to innovation, and a general apathy towards adopting new technologies, especially among more traditional academics (Lašáková et al., 2017; Vogelsang et al., 2020). Additionally, there is a common resistance against new information technologies, complicating the transition (Jhones & Larramendi, 2019). Conflicts stemming from organizational changes during the digital revolution can empower some individuals while sidelining others. This resistance often arises from ingrained habits and concerns about economic risks linked to change, alongside fears of the unknown, privacy issues, and worries about data traceability.

Another significant challenge to effectively implementing digital academic records management is inadequate IT infrastructure. Issues like insufficient IT infrastructure and underdeveloped IT support teams (Musembe, 2016) are major hurdles to digital transformation. A solid IT framework (Kaminskyi et al., 2018), strong IT support (Abraham & Caroline, 2018), and reliable high-speed internet are crucial for successful digital transformation in HEIs (Mikheev et al., 2021; Aditya et al., 2020; Jhones & Larramendi, 2019). Various studies have revealed that a lack of suitable infrastructure impedes effective digital technology use, pointing to problems like poor Wi-Fi access and slow internet speeds (Abraham & Caroline, 2025; Gkrimpizi et al., 2023; Jhones & Larramendi, 2019). Concerns have been raised about the preparedness of IT infrastructure for digital records management implementation in Ghana (Azameti & Adjei, 2013). Gkrimpizi et al. (2023) note that inadequate infrastructure is a significant barrier to digital transformation across Africa, leading to disparities in access to information, knowledge, and global networks that also affect universities.

The literature also points to security and privacy risks as major challenges when it comes to effectively implementing digital academic records management in higher learning institutions. Yakubu et al. (2024) identify several key issues related to academic records management, including the risk of identity theft, unauthorized access to system resources, and cybersecurity threats. Cybersecurity is a pressing concern for many higher education institutions since rich student data is at risk, particularly when accessed online. Poorly designed web applications can

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leave systems vulnerable to a range of cyberattacks (Alzighaibi, 2021). Many universities are not adequately equipped to deal with the security threats that arise from expanding their digital infrastructures (Yakubu et al., 2024; Alzighaibi, 2021; Metto, 2021). Additionally, the lack of standardized data exchange protocols and legal frameworks to manage digital system interactions poses challenges (VanWyk & Du Toit, 2016). Ibor et al. (2018) point out that in many African universities, digital content is controlled by a sole administrator, which can lead to issues with authorized changes to records due to centralized database control. Users are also concerned about losing control over their personal information, particularly around data traceability (Yakubu et al., 2024).

Finally, the absence of strategic planning and clear policy directions has been recognized as a significant barrier to effective academic records management in higher education settings. Vanwyk and Du Toit (2016) stress that without an integrated records management strategy, universities in developing countries are at risk. A case study by Momoti and King (2019) at the University of the Western Cape revealed that records management was not fully integrated with other business processes, leading to accountability issues and a lack of transparency in universities in Kenya (Vanwyk & Du Toit, 2016). Giba-Fosu (2020) found that academic records management programs in African universities generally are not documented as they are in developed nations. These insights align with findings from Muchaonyerwa and Khayundi (2014), who noted that many African universities lack cohesive records management strategies. Similarly, Khumalo and Chigario (2017) reported ineffective records management practices. Research by Seniwoliba et al. (2017) showed that the records management programs at most HEIs were not aligned with the institutions' broader corporate strategies. They advocated for better integration of records management into university-wide strategic initiatives. Musembe (2016) supports this notion, arguing that where records management is positioned within an institution's hierarchy reflects management’s commitment to the program's success. To tackle these challenges, developing a digital investment prioritization plan might be essential for achieving systematic organizational transformation. While it is clear that effectively planning and executing digital transformation in higher education requires a comprehensive strategy, many institutions still grapple with a lack of cohesive strategy, inconsistent governance, and misalignment between their strategic goals and the core teaching and learning processes central to digital transformation.

The successful adoption and implementation of modern academic records management systems in higher education institutions (HEIs) hold great potential for enhancing the management of students' academic records. However, several challenges continue to hinder the effective integration and maintenance of these systems. As highlighted in the literature, factors such as inadequate IT infrastructure, lack of digital literacy, resistance to change, and security risks remain significant barriers to the seamless adoption of digital records management. Additionally, the absence of clear policies, strategic planning, and integrated systems further complicates efforts to achieve successful digital transformation in HEIs.

To overcome these challenges, institutions must prioritize the development of a robust digital infrastructure, enhance digital literacy among staff and students, and establish a strategic framework that aligns records management with institutional goals. Collaboration among key stakeholders, including university management, IT departments, and records management

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practitioners, is essential to facilitate the successful integration of digital systems. Furthermore, addressing security and privacy concerns, along with the establishment of standardized data exchange protocols and legal frameworks, will ensure that academic records are securely managed and protected.

In conclusion, while the path toward effective digital academic records management in HEIs is fraught with challenges, concerted efforts to address these obstacles through targeted policies, capacity building, and technological investments can significantly enhance the success of digital transformation initiatives. This, in turn, will not only improve the management of academic records but also support the broader goals of digital transformation in higher education, fostering an environment of transparency, efficiency, and accountability.

Measures to Ensure the Privacy and Security of Academic Records in Digital Systems

Ibor et. al. (2018) argued that ensuring the security of digitized academic records hinges on how accurately these records are processed and stored. Processing takes place prior to storage, with the saved records reflecting valid information regarding individual students' choices. They point out that while the storage of academic records itself is not particularly complicated, issues can emerge when the stored data gets altered, lost, or destroyed due to factors like fraud, natural disasters, or system failures. Other researchers, including Yakubu et al. (2024), highlight an increasing need for more advanced yet budget-friendly methods to protect academic records due to their delicate nature and significance in higher education settings.

Mbam and Odachi (2014) stressed the importance of having solid strategies for storing and retrieving these digitized academic records. Generally, these records are kept in relational database management systems like Oracle, PostgreSQL, SQL Server, or MySQL, and they are usually part of web-based or desktop academic information systems used by many institutions. Lemieux (2016) points out that when managing these databases, it is crucial to focus on authenticity and reliability.

Ibor et al. (2018) further discussed how digital records are often overseen by a single administrator with complete rights and access, which can lead to unauthorized modifications due to this centralized control. To tackle this problem, they suggest using blockchain technology, which would allow for academic records to be stored, modified, shared, and verified through a decentralized consensus, ensuring that authorized individuals are notified of any changes and can either approve or reject updates based on their hash values.

Yakubu et al. (2024) observed that in today’s digital world, vast amounts of valuable data regarding schools and students’ academic histories are being accumulated, making them appealing targets for cybercriminals. Despite these risks, many universities have not adequately tackled security issues, leaving educational institutions more vulnerable to cyberattacks aimed at unauthorized access to sensitive information. To combat this, Yakubu et al. (2024) recommend enhancing communication between university IT departments and the various stakeholders involved in managing academic data. They argue that the evolving strategies of cybercriminals require a comprehensive security framework, which should include identifying and resolving system vulnerabilities, minimizing potential threats, and ensuring quick recovery of system services.

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Gupta and Kumar (2014) identified several protections currently in place to secure academic record systems against unauthorized access and attacks, such as stronger authentication systems. While PINs and passwords are common, they are not exactly strong defenses against unauthorized access since they can be easily compromised with brute-force attacks (Yakubu et al., 2024). For instance, a 4-digit PIN can be cracked in 10,000 tries. Although longer passwords are somewhat safer, they can still be vulnerable if they are weak. Yakubu et al. (2024) recommend adopting credential-based authentication systems where users get digitally signed credentials from a legitimate provider, as these are harder to forge or crack, offering much better security.

In addition to authentication, it is vital to implement confidentiality measures within academic record systems to protect sensitive student data from unauthorized access. Mbam and Odachi (2014) suggested various methods to ensure confidentiality, including the previously mentioned authentication techniques. However, if an intruder breaches the system, they could easily manipulate the data. For example, if a student's personal information is sent over the internet or an internal network, an unauthorized person might intercept it during transmission. This is why stronger encryption methods are crucial. Traditional encryption methods can be prone to both accidental and intentional security breaches. For instance, someone who holds the information might accidentally or intentionally share confidential records with unauthorized individuals, compromising the encryption's effectiveness. To tackle this issue, this article proposes a device-specific encryption system that limits access to student academic records to designated devices only. Each of these devices would have unique secret keys, acting as the sole passcode to decrypt the records. Therefore, only the device owners would be able to access and handle the records on their respective devices.

Yakubu et al. (2024) emphasized that effective security measures come from a thorough understanding of potential threats and existing protective systems. This involves conducting ongoing risk assessments and accurate reporting. They propose the Plan-Implement-Evaluate-Maintain (PIEM) model as a strategic method for addressing cybersecurity threats in higher education institutions. This model underscores the necessity of collaboration among IT staff, internal and external stakeholders, and users to ensure the security of academic record systems.

In conclusion, safeguarding digitized academic records is a complex challenge that requires focused attention on both technological and organizational strategies. As pointed out by Ibor et al. (2018) and other researchers, the integrity of these records is not only crucial for academic institutions but also exposed to various threats, including system failures, fraud, and cyberattacks. To tackle these issues, experts suggest embracing advanced technologies like blockchain and credential-based authentication, alongside comprehensive security frameworks like the PIEM model. Moreover, ongoing risk assessments, robust encryption techniques, and prioritizing confidentiality and authenticity are essential for protecting sensitive student data. Ultimately, a collaborative effort among IT departments, stakeholders, and users is vital for developing a secure and resilient academic record management system capable of facing the ever-evolving challenges of the digital age.

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CONCLUSION

To conclude, managing academic records effectively is crucial for the smooth running of higher education institutions, especially in Africa. While there is some consistency in how these institutions handle records, major challenges remain. Many universities have set up comprehensive records management practices, but these often do not fully align with their institutional policies, which leads to inefficiencies in keeping records and a lack of connection to the institution's broader goals. The main issues include poor infrastructure, inadequate staff training, and uneven implementation of electronic records management systems. Therefore, it is vital to move toward integrated records management strategies that include clear policies, strong infrastructure, and trained personnel. This will help to ensure that academic records are properly created, stored, retrieved, and disposed of. Additionally, aligning record management with strategic goals will improve governance, transparency, and efficiency.

Shifting to electronic records management looks promising for enhancing accessibility and protecting records, but for successful adoption, resources like technical support and staff training are needed. Tackling these challenges with a comprehensive approach to records management is key to improving academic administration and ensuring accountability in African higher education institutions. Although the journey toward effective digital management of academic records is challenging, focused efforts on addressing these barriers through specific policies, skill development, and tech investments can significantly boost the success of digital transformation initiatives.

This improvement will not just enhance the management of academic records, but also back the larger goals of digital transformation, fostering an atmosphere of transparency, efficiency, and accountability. Ongoing risk assessments, strong encryption methods, and a commitment to keeping sensitive student data confidential and authentic will be crucial. Ultimately, it is essential to have a collaborative effort between IT departments, stakeholders, and users to build a secure and resilient academic record management system that can adapt to the changing challenges of the digital era.

RECOMMENDATIONS

To improve how academic records are managed in African higher education institutions, the following suggestions are proposed:

1. Integrate Records Management into Policies: Universities should make it a priority to include academic records management in their overall policies and strategic goals. This alignment with the university's mission and governance objectives will boost operational efficiency and accountability.

2. Create Clear Policies: Higher education institutions need to establish clear and comprehensive records management policies that cover both manual and digital systems.

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These policies should outline standards for record creation, storage, retrieval, disposal, and security, along with a framework for regular review and improvement.

3. Invest in Infrastructure and Technology: Institutions should allocate resources to develop the necessary infrastructure to support digital records management, which includes secure servers, data backup solutions, and reliable software for creating and accessing records. Keeping this infrastructure up-to-date is crucial to handle the evolving nature of digital recordkeeping and to protect sensitive student information.

4. Build Capacity and Train Staff: One significant hurdle in effective records management is the lack of proper staff training. Universities should create ongoing professional development programs for those involved in managing records, focusing on both manual and digital systems. These programs should highlight the importance of data security, adherence to regulations, and effective use of digital tools.

5. Encourage Interdepartmental Collaboration: Effective records management requires teamwork across various university departments such as IT, administration, and academic units. A collaborative approach will help ensure records management becomes part of daily operations and that staff receive the necessary support to apply best practices.

6. Adopt Digital Records Management Systems: The shift to electronic records management should be expedited by implementing secure, user-friendly systems that allow for easy access and retrieval of academic records. Clear guidelines should back these systems to ensure data integrity, confidentiality, and compliance with all legal and regulatory requirements.

7. Focus on Risk Management and Data Security: Universities need to enforce strong security measures, like encryption and multi-factor authentication, to safeguard sensitive student records from unauthorized access, cyber threats, or data breaches. Conducting ongoing risk assessments is essential to pinpoint vulnerabilities and develop strategies to address potential risks.

8. Establish Continuous Monitoring and Evaluation: Institutions should put in place systems for ongoing monitoring and evaluation of their records management practices. Regular audits, feedback mechanisms, and performance evaluations will help to ensure that processes remain efficient, effective, and aligned with the university's objectives.

By following these recommendations, African higher education institutions can improve the management of academic records, tackle current challenges, and advance their digital transformation efforts. These enhancements will support compliance and efficiency, while also fostering better governance, transparency, and accountability within the academic administration.

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