### **THE PROBLEM AND IT’S SCOPE**

### **RATIONALE OF THE STUDY**

In today’s digital era, the management of institutional files has become a vital concern in higher education. Colleges and universities deal with a wide range of documents daily, such as academic records, administrative files, and official communications. At Lapu-Lapu City College, specifically within the College of Professional and Cooperative Education (COPC), the manual handling of files often results in inefficiencies, delays, and risks of data misplacement. Traditional methods such as paper-based filing or fragmented digital storage systems fail to meet the demands of accuracy, security, and accessibility required in academic institutions. These issues present a pressing problem: how can colleges adopt a secure and efficient digital document management system that is both user-friendly and tailored to their specific context?

While various document management systems (DMS) are available, many are either too complex, costly, or lack the flexibility to adapt to the unique needs of academic institutions. Previous studies emphasize that while DMS platforms significantly improve productivity and collaboration, there remains a gap when it comes to localized solutions that incorporate institutional requirements such as domain-specific login systems, role-based permissions, and audit logs (Alalwan et al., 2018; Patil & Sangle, 2020). In the Philippine context, few studies have documented customized systems for higher education, leaving a knowledge gap in the literature. Thus, the development of DocuDB, an automated document management system specifically designed for COPC, seeks to fill this gap by providing a secure and efficient platform for transferring, storing, organizing, and retrieving documents.

The features of DocuDB directly address the shortcomings of existing systems. Its file management tools such as uploading, organizing, previewing, downloading, and sharing streamline the everyday workflow of faculty and staff. Content extraction and search functions allow users to retrieve files quickly, improving accessibility and reducing the time spent locating documents. Moreover, security features such as role-based access control, file and folder permissions, and audit logs ensure that confidential data remains protected and that accountability is maintained. Additional tools, including user management, activity monitoring, version history, and automated backups, further enhance system reliability and continuity. By incorporating comments, annotations, and mobile-friendly access, the system also fosters collaboration and flexibility, which are essential in modern academic environments.

The significance of this study Is rooted in its practical and theoretical contributions. Practically, the system responds to the urgent need for digital transformation in educational institutions, helping colleges improve governance, streamline administrative processes, and strengthen data security. Theoretically, this study contributes to the literature on educational technology by demonstrating how customized, context-driven systems can address specific institutional challenges, in contrast to generalized DMS solutions. Research on digital learning platforms and cloud-based management tools confirms that properly designed systems enhance organizational performance and learning outcomes (Chong et al., 2020). However, little is known about how these solutions can be localized in academic settings in the Philippines, making this study both timely and necessary.

The novelty of this research lies in its integration of widely used database technology (MongoDB) with institution-specific features designed for Lapu-Lapu City College. Unlike generic systems, DocuDB was developed with consideration of the college’s unique workflows, data privacy requirements, and user environment. The timing of this study is particularly important given the rapid acceleration of digital transformation in education, influenced by global shifts such as the COVID-19 pandemic, which highlighted the urgency of robust digital infrastructures (Bao, 2020). By addressing these current needs, the research not only provides a solution for COPC but also offers a model that can be replicated or adapted by other institutions seeking to transition into efficient and secure digital practices.

In a broader context, this study aligns with national and global efforts to modernize education through digital innovation. The Commission on Higher Education (CHED) in the Philippines has emphasized the importance of integrating technology in institutional management to promote efficiency and resilience (CHED, 2020). Globally, the move toward smart and digital campuses underscores the relevance of building tailored systems that enhance academic operations. Through its unique approach and user-centered design, DocuDB demonstrates how technology can be harnessed not only to solve local problems but also to contribute to the larger goal of digital transformation in education. .

**THE PROBLEM**

**STATEMENT OF THE PROBLEM**

This study aims to evaluate the effectiveness, usability, and reliability of **DocuDB**, an automated document management system designed to address the challenges of storing, organizing, and securing institutional files at Lapu-Lapu City College (LLCC), particularly within the College of Professional and Cooperative Education (COPC). Specifically, this research seeks to answer the following questions:

1. To what extent do DocuDB’s core features, such as **file management, content extraction, and search tools**, meet the functional requirements and needs of its users?
2. How **user-friendly and efficient** is the navigation experience provided by DocuDB’s interface across both desktop and mobile platforms?
3. To what extent does DocuDB improve **document security and accountability** through its role-based access control, file and folder permissions, and audit log features?
4. How effective is DocuDB in supporting **collaboration and accessibility** through functions such as comments, annotations, file sharing, and version history?
5. Based on the findings of this study, what recommendations can be proposed to further enhance DocuDB in addressing institutional challenges, strengthening digital governance, and meeting the specific needs of Lapu-Lapu City College (LLCC)?

**Objectives of the Study**

The main objective of this study is to evaluate the effectiveness, usability, and functionality of **DocuDB**, an automated document management system developed for the College of Professional and Cooperative Education (COPC) at Lapu-Lapu City College. Specifically, this study aims to:

1. **Assess Core Features** – Determine whether DocuDB’s core features, such as file uploading, storage, organization, preview, downloading, and sharing, meet the functional requirements and needs of its users.
2. **Evaluate User Experience** – Analyze the user-friendliness, accessibility, and efficiency of the navigation experience provided by DocuDB’s interface across both desktop and mobile platforms.
3. **Examine Search and Accessibility** – Assess the extent to which DocuDB enhances file retrieval and accessibility through its content extraction and search tools.
4. **Analyze Security Functions** – Measure the effectiveness of DocuDB’s security features, including role-based access control, file and folder permissions, and activity logs, in protecting institutional documents and ensuring accountability.
5. **Support Collaboration and Continuity** – Evaluate how DocuDB promotes collaboration and information continuity through features such as comments, annotations, version history, and automated backups.
6. **Provide Recommendations** – Based on the findings of this study, propose recommendations to further improve DocuDB in addressing institutional challenges, enhancing digital governance, and meeting the specific needs of Lapu-Lapu City College.

**Significance of the Study**

The development of DocuDB, an automated document management system, is significant in addressing the common problems of disorganized storage, lack of accessibility, and security risks faced in handling institutional files at Lapu-Lapu City College. By introducing a centralized and secure platform, this study contributes to the digital transformation of the College of Professional and Cooperative Education (COPC). It is expected to benefit the following groups.

**Institutions and Colleges**

DocuDB provides a structured platform for file management by offering tools for uploading, organizing, previewing, downloading, and sharing documents. With its search and text extraction functions, the system helps reduce delays in retrieving important files. This improves efficiency in administrative and academic operations, allowing colleges to better safeguard institutional records while ensuring accessibility to authorized users.

**Administrators**

Through features such as role-based access control, file and folder permissions, and audit logs, administrators gain greater control and accountability over the management of sensitive files. Tools for user management, activity monitoring, and version history further strengthen governance, ensuring that document handling is both secure and transparent.

**Faculty and Staff**

DocuDB assists faculty and staff in performing their tasks more effectively by providing quick access to documents, reducing the risk of misplaced files, and enabling secure sharing of materials. Collaboration features, such as comments and annotations, allow users to work together seamlessly, while automated backups ensure continuity of information even during technical disruptions.

**Researchers and Developers**

This study offers practical insights into designing automated document management systems that balance security, usability, and collaboration. By evaluating DocuDB’s effectiveness, researchers and developers can use its features as a reference for building or improving similar systems tailored to the needs of academic institutions.

**Future Researchers**

Future researchers may build on this study by exploring additional features that can enhance document management systems, such as artificial intelligence for predictive search, advanced analytics for usage monitoring, or integration with other academic platforms. In this way, DocuDB serves as both a practical solution for COPC and a foundation for further studies in educational technology and digital governance.

**Academic Institutions**

This study contributes to academic discussions on strengthening institutional productivity and governance through digital innovation. By presenting DocuDB as a practical example of an automated document management system, the research highlights how file organization, secure storage, and role-based access can directly support the academic and administrative operations of colleges.

Bringing up rear, this study addresses the challenges of file disorganization, accessibility, and data security by introducing DocuDB, a structured and role-based solution. It benefits multiple stakeholders by streamlining workflows, fostering collaboration, and safeguarding institutional records, while also serving as a foundation for future research and system development in educational technology.

**Scope of the Study**

This study focuses on the design, development, and evaluation of **DocuDB**, a document management system created for Lapu-Lapu City College. The system is designed to provide a secure and centralized platform for uploading, storing, organizing, and retrieving academic and institutional files.

Key features of the system include:

**User Authentication** – A login system limited to the Lapu-Lapu City College domain to ensure secure access.

**File Management** – Uploading, storing, previewing, downloading, sharing, and organizing documents within folders.

**Content Extraction and Search** – A text extraction feature that allows users to easily search and locate files.

**Security and Permissions** – Role-Based Access Control, file and folder permissions, and audit logs for secure and organized access to data.

**Admin Controls** – Tools for user management, activity monitoring, and version history for efficient system administration.

**Additional Features** – Comments and annotations for collaboration, mobile-friendly accessibility, and automated backups for data protection.

**Limitations of the Study**

While DocuDB provides a functional and secure document management system for Lapu-Lapu City College, this study is subject to the following limitations:

**Restricted Access** – The login system is limited only to users with the Lapu-Lapu City College domain, which means it cannot be used by external organizations or individuals.

**Limited Integration** – The system does not currently integrate with third-party tools such as Google Drive, Microsoft Office, or other cloud-based platforms.

**Scalability** – The system is designed primarily for small to medium-sized groups and may face performance issues if used for large-scale institutional storage.

**Basic Analytics** – While audit logs and version history are available, the system does not yet provide advanced reporting or analytics for document usage and performance tracking.

**Offline Availability** – The platform requires an internet connection to access and manage files, with no offline mode supported.

**Mobile Limitations** – Although mobile-friendly, certain features such as file preview and annotations may not function as smoothly on smaller devices compared to desktop use.

**Customization** – The system has fixed roles and permissions and does not yet allow extensive customization based on unique departmental requirements.

**Theoretical Background**

This study is anchored in a confluence of theoretical frameworks that underpin the design, implementation, and evaluation of digital document management systems (DMS) in educational settings. The development of DocuDB is not merely a technical exercise but is deeply rooted in theories that explain technology adoption, information management, and organizational behavior. The primary theoretical lenses guiding this research are the Technology Acceptance Model (TAM), Information Management Theory, and the principles of Role-Based Access Control (RBAC) within the broader context of Digital Transformation in Education.

The Technology Acceptance Model (Davis, 1989) serves as a fundamental framework for understanding and predicting user adoption of new information systems. TAM posits that two primary factors determine an individual's intention to use a system: Perceived Usefulness (PU) and Perceived Ease of Use (PEOU). Perceived Usefulness is defined as the degree to which a person believes that using a particular system would enhance their job performance, while Perceived Ease of Use refers to the degree to which a person believes that using the system would be free of effort.

This study leverages TAM to evaluate DocuDB's effectiveness. The system's core features such as streamlined file uploading, efficient search tools, and quick retrieval are designed to directly enhance Perceived Usefulness by improving administrative productivity and reducing delays. Furthermore, the focus on a user-friendly interface across desktop and mobile platforms aims to maximize Perceived Ease of Use, thereby encouraging adoption among faculty and staff at Lapu-Lapu City College. By investigating the system's usability and efficiency, this research empirically tests TAM's core constructs in the specific context of a Philippine higher education institution.

Information Management Theory provides a lens for understanding how organization’s structure, process, and utilize information to achieve efficiency and decision-making effectiveness. A key tenet of this theory is that disorganized information leads to inefficiency, increased cognitive load, and operational risks (Choo, 2002). The manual, paper-based filing systems previously used at COPC exemplify these challenges, resulting in data misplacement and inaccessibility.

DocuDB is conceptualized as an intervention grounded in Information Management Theory. It addresses the core problem of disorganization by providing a centralized, structured platform for information storage and retrieval. Features like folder organization, content extraction, and metadata search are direct applications of this theory, aiming to transform unstructured data into organized, accessible, and meaningful information. This enhances the college's ability to manage its institutional memory, supports better decision-making, and aligns with the theory's goal of turning information into a strategic asset.

The principle of Role-Based Access Control (RBAC) is a critical security concept integrated into the system's design (Ferraiolo & Kuhn, 1992). RBAC restricts system access to authorized users based on their defined roles within an organization. This is not merely a technical feature but a governance mechanism that enforces the principle of least privilege, ensuring users can only access the information necessary for their duties.

DocuDB's security architecture is built upon RBAC theory. The implementation of role-based permissions for files and folders, coupled with audit logs, directly operationalizes this framework. It ensures data confidentiality (protecting sensitive records from unauthorized access) and accountability (tracking user actions for transparency). This theoretical foundation is crucial for an academic institution handling confidential student and administrative data, addressing the significant risks associated with traditional, less secure file management methods.

The overarching context for this study is the global and national impetus for digital transformation within the education sector. This paradigm shift involves leveraging technology to fundamentally improve institutional processes, agility, and value delivery (Vial, 2019). The COVID-19 pandemic, as noted by Bao (2020), acted as a catalyst, highlighting the urgent need for robust digital infrastructures.

The development of DocuDB is a direct response to this call for digital maturity. It aligns with the Commission on Higher Education's (CHED, 2020) guidelines promoting technology integration for institutional resilience. The system moves beyond simple digitization (converting paper to digital) towards true transformation by reengineering the document workflow. It fosters collaboration (through comments and annotations), ensures business continuity (via automated backups), and enhances digital governance, thereby positioning COPC and Lapu-Lapu City College to thrive in an increasingly digital educational landscape.

In synthesis, the theoretical background for this study is multi-faceted. The Technology Acceptance Model (TAM) predicts and explains user adoption, Information Management Theory justifies the need for a structured system to combat disorganization, and Role-Based Access Control (RBAC) provides the security foundation. All of this is situated within the larger narrative of Digital Transformation, which provides the strategic rationale for why such a system is not just beneficial but essential for modern educational institutions. DocuDB, therefore, represents the practical application of these theories, aiming to create a system that is not only technologically sound but also theoretically grounded and contextually relevant to the needs of Lapu-Lapu City College.

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