# Nu Drop: A Secure Document Request and Online Payment System

John Kenneth L. Ortigueras, Felix Deo C. Sartorio, Kim Cyruz M. Villanueva and Irene L. Balmes
*School of Architecture, Computing, and Engineering, National University, NU-Lipa, Lipa City, 4127 Batangas, Philippines*
*ortiguerasjl@students.nu-lipa.edu.ph, sartoriofc@students.nu-lipa.edu.ph, villanuevakm@students.nu-lipa.edu.ph, ilbalmes@nu-lipa.edu.ph*

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Abstract: The manual nature of requesting documents in paper form and over-the-counter payments has continued to exist in many higher education institutions, thus creating long lines, misplaced forms, delays in processing, and exposure to document tampering. To counter these issues, this study designed and developed NU DROP, a secure, web-based system that uniquely integrates document requests with online payment processing in a single platform tailored for Higher Education Institutions (HEI). The system allows for online document requests, status tracking in real time, and multi-channel payments (with online facilities, such as GCash and PayMaya, and over the counter via SM Bills). The development process followed the Scrum methodology and took into consideration interviews, field observation, and document analysis. Key contributions include: 1) an end-to-end process unifying the registrar-accounting-user workflows; 2) QR-based verification to detect tampering of issued PDFs using server-validated cryptographic hashes; 3) inclusive payment options catering to both e-wallet and cash-based users; and 4) role-based dashboards with audit logging for transparency and accountability. Early stakeholder walkthroughs show evidence of better turnaround time visibility, less manual follow-up, and more consistent recordkeeping.

## 1 INTRODUCTION

Document processing in many higher education institutions remains a manual task, which sometimes manifests as long queues, misplaced forms, limited office hours, and insecure verifications of official records [1], [2]. Such problems tend to burden administrative staff and decrease user satisfaction with the services provided by students, alumni, and faculty [3]. In certain institutions, requestors will fill in paper forms, pay at cashier windows, and return receipts to other offices for validation – this tiresome process not only makes it error-prone but also difficult to track status, thereby further delaying service delivery [4].

Hence, this study introduces NU DROP, which totally digitizes the entire document request and payment workflow via a secure web-based platform [2]. This fully certified online submission facilitates online payment on any of the given inclusive payment channels and gives a tracking tool to monitor request status in real time. The administrator manages and monitors requests via a central dashboard for user's requests, payment validation, and document issuance. And to preserve the authenticity of documents issued by NU DROP, an instant on-the-spot validation of issued documents is accomplished through a QR-based tamper-resistant verification mechanism.

The NU DROP system stands apart from existing systems in other universities in three major aspects: first, the integration of registrar and accounting workflows to minimize delays due to reconciliation; second, the provision for payment through an e-wallet as well as over the counter; and third, an approach to document verification that resists tampering, which essentially employs QR-linked cryptographic hashes.

The remainder of this paper is organized as follows. Section 2 presents the related works and gaps in existing systems for document requests and payments. Section 4 outlines the methodology, including the research design, data collection, and system development process. Section 5 describes the features and technical implementation of the NU DROP system. Section 5 discusses the results and contributions, while Section 6 provides the conclusion and recommendations for future work.

# 2 RELATED WORK AND GAP

Many universities have adopted online requests and payment portals, though these typically provide only basic features such as request submission, limited tracking, and partial payment integration [2]. Significant gaps remain [5], including administrative fragmentation where registrar and accounting departments operate separate systems requiring manual reconciliation, a lack of payment inclusion for cash-preferred users without access to cards or banks, and weak authenticity assurance since issued documents are still prone to tampering when only basic watermarks are used.

NU DROP gets rid of these gaps by unifying interdepartmental workflows, providing inclusive multi-channel payments, and a QR verification component embedded with tamper-resistant features. Research on electronic payment systems in Philippine HEIs [6] confirms the importance of offering diverse payment options to accommodate different user preferences.

# 3 OBJECTIVES

The primary objective of this study is to develop and organize a secure-based installation system that is user-centric, facilitates the request and payment of documents while preserving the authenticity of the issued records.

Specifically, this study sought to address the following objectives:

- To enable web-based request submission with status tracking and notifications.
- To facilitate inclusive secure payment options, i.e., GCash, PayMaya, and SM Bills.
- To apply QR-based tamper detection for issued documents.
- To develop a dashboard for registrar, accounting, and admin roles will also have audit logging features.

The contributions of this study are fourfold. First, the entire process has been automated, significantly reducing reliance on manual procedures. Second, the system provides greater integration of payments by accommodating both electronic and cash-preferred customers. Third, a tamper-proof QR verification mechanism is implemented to ensure the authenticity of issued documents. Finally, the study presents a realistic yet general architectural model that can be adopted and adapted within higher education contexts.

# 4 METHODS

This section outlines the methodological approach undertaken in the design and development of the NU DROP system. It describes the process of developing the system using SCRUM.

## 4.1 Scrum Model

Using Scrum Methodology [7] encourages continuous iterative development and the constant engagement of all relevant stakeholders. Sprint planning, backlog preparation, execution, and reviews served the team in iterative refinement of the NU DROP system based on user feedback.

## 4.2 Data Collection

Interviews were conducted with students, staff, and administrators to identify pain points in the existing processes [8]. In addition, field observations were carried out in the registrar and accounting offices to directly observe workflow bottlenecks as they occurred. Document analysis was also performed on historical request logs and payment records to determine peak transaction periods and recurring issues.

# 5 RESULTS AND DISCUSSION

## 5.1 The Main Feature

The NU DROP system offers a range of features designed to streamline document requests and payments. For users, the system provides online request submission, real-time status tracking, and access to transaction history. The registrar dashboard supports the processing of requests, monitoring of document status, and workload management. The accountancy dashboard enables payment confirmation, reconciliation, and financial report generation, while administrative tools allow for the management of user accounts, roles, document types, and payment methods. Finally, a QR-based online verification mechanism is integrated to confirm the authenticity of issued PDF documents and prevent tampering.

## 5.2 Technical Implementation

The technical implementation of the NU DROP system was carried out using a modern web technology stack [9]. The backend was developed with Laravel 10 running on PHP 8.x, while the frontend employed Blade Templates integrated with the Tailwind CSS framework to ensure a responsive and consistent user interface. MySQL database was used for data storage and management. System notifications were implemented through email, with optional support for Firebase Cloud Messaging (FCM) to enable real-time alerts. Security measures included Laravel Sanctum for authentication, CSRF protection, role-based access control, and audit logging to ensure data integrity and accountability. To further enhance trust, a tampering detection mechanism was integrated, where each issued PDF is assigned a SHA-256 hash stored on the server, and a QR code is generated pointing to a verification endpoint for authenticity checks.

## 5.3 NU DROP Web Application Screenshots

Figure 1 is the Home Page of the NU DROP system serves as the primary entry point for users, providing a clean and intuitive interface that highlights the system's core functions. From this page, students and staff can quickly access the online document request feature, view the real-time status of their pending requests, and review their transaction history. Clear navigation menus and responsive design elements ensure accessibility across devices, while quick links to support, payment channels, and login options streamline the user experience. The home page is designed to be user-centric, minimizing complexity while giving immediate visibility to the most frequently used services.

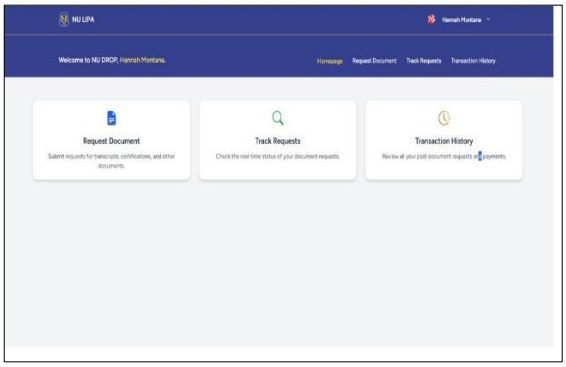


Figure 1: Home page.

Figure 2 is the NU DROP Admin Dashboard. It is a centralized system providing administrators with a general view of what happens in the system, especially in managing the online document requests and payment transactions. It provides the admin with key information regarding the total number of documents available, total requests made by users, status of requests – not verified, verified, pending, on process, ready for pickup, or released. This will essentially help the admin monitor the flow of requests effectively. Also, included in the dashboard is a revenue summary that shows weekly, monthly, and annual income generated from online payments. At the lower section, there is a visual chart that presents the top requested documents out there, like the Transcript of Records and Certificate of Registration, so that administrators can get an idea of user demand and make informed decisions. In summary, the admin dashboard has been conceived to facilitate backend processes, thus enhancing accountability and promoting quick service delivery.

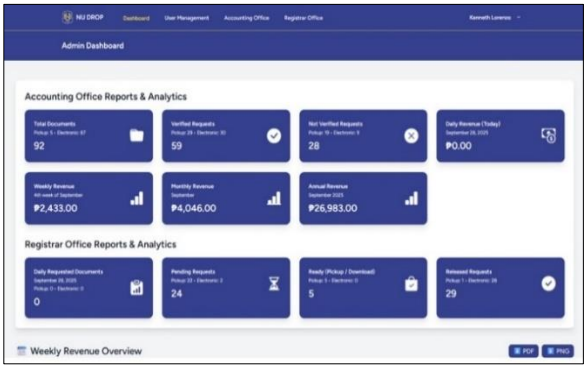


Figure 2: Admin dashboard.

Figure 3 is the NU DROP Accounting Office Dashboard. The Accounting Dashboard stands as a neat arrangement for initiating and monitoring document payment transactions. It provides important information on the overall requests versus unverified requests versus verified requests, thus enabling accounting staff to validate and track payment status easily. Financial summaries are also presented, covering income trends such as weekly, monthly, and yearly sales figures, thus providing an accounting office with a full understanding of income trends. Another feature of the dashboard is the Weekly Revenue Overview, providing a graphical way of assessing financial activity over time. This interface ensures utmost efficiency within the accounting office while promoting the accuracy and transparency of payment procedures.

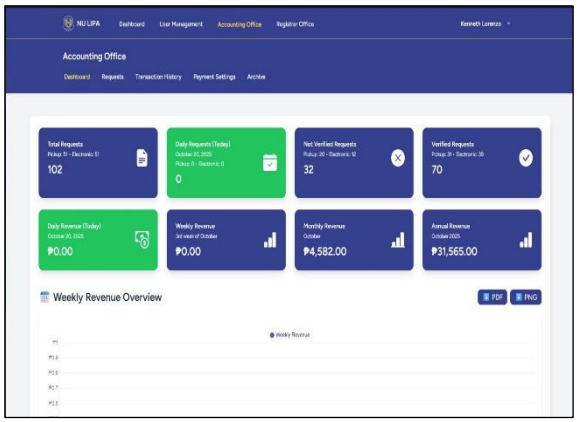


Figure 3: Accounting office dashboard.

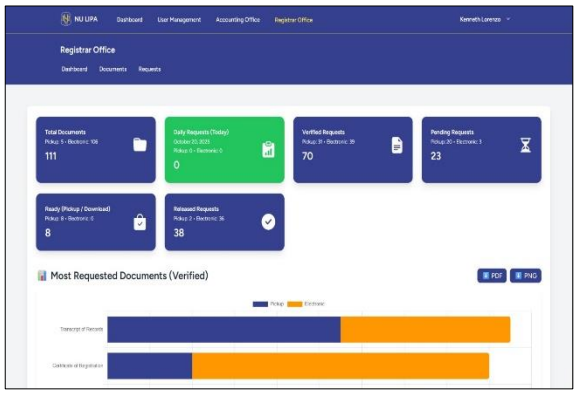


Figure 4: Registrar dashboard.

Figure 4 is the NU DROP Registrar Office, serves the purpose of sending requests for documents related to the activities of the registrar. It holds significant details such as the number of document types, verified requests, pending requests, documents presently being processed, and documents that have already been collected or sent for release. This feature provides complete supervision for administrative staff to effectively monitor and take necessary actions on the status of requests. The dashboard also features a graphical representation in a chart of Most Requested Documents, which indicates the most requested documents by users, such as the Transcript of Records or Certificate of Registration. This improves the ease of and more efficient handling of documents, prioritizing, assigning resources, etc.

As shown in Figure 5, the settings page for payments provides options for changing the possible methods of payment, for example, e-wallets with an uploaded QR code by an administrator.

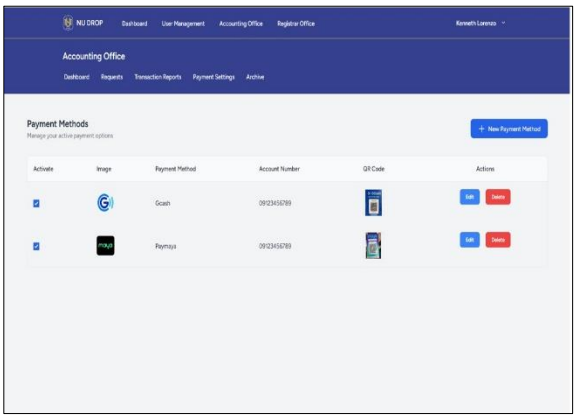


Figure 5: Payment settings.

Figure 6 presents the Request Documents Page, where students can request official records such as transcripts and certificates directly from the university. The interface allows users to browse the list of available documents, select the required type, and complete the request online. This module eliminates the need for in-person visits to the registrar's office, offering a more convenient and efficient process for both current students and graduates.

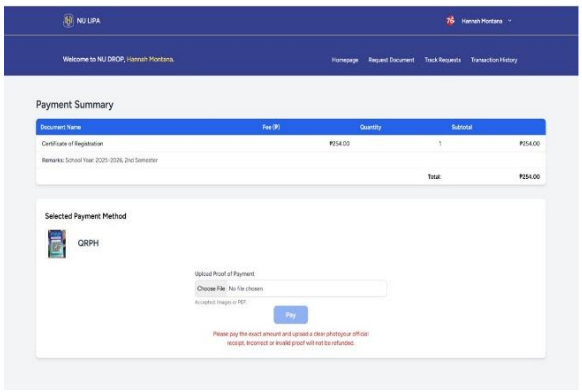


Figure 6: Request document page.

NU DROP addresses the limitations of manual processes by providing faster, more efficient, transparent, and secure services [10]. Initial feedback indicates that the system's unified workflows significantly reduce reconciliation delays between departments [11]. Its inclusive payment options improve accessibility for a broader range of users, while the integration of QR-based verification ensures more reliable document authenticity. Collectively, these features represent exclusive capabilities and unique differentiators of NU DROP,

highlighting its originality and technological value compared to existing systems.

# 6 CONCLUSIONS

NU DROP shows how a digital transformation can facilitate the streamlining of administrative workflows in higher education institutions. With the inclusion of payment options, anti-tamper verification, and centralized dashboards, the system innovates into authentication, inclusivity, and accountability, far beyond the traditional online portal. Future developments will look toward integrating direct payment gateways and support for mobile applications.

Although the NU DROP system demonstrated improvements in streamlining document requests and payments, certain limitations remain. The system relies on stable internet connectivity, which may affect access for users in areas with limited or unstable networks. In addition, while security mechanisms such as QR-based verification and role-based access were implemented, further testing under large-scale deployment scenarios is needed to validate performance and scalability. For future development, the system may be enhanced by integrating advanced analytics for usage monitoring, expanding payment channels, and incorporating mobile application support to further improve accessibility and user experience.

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