

# UA Clinic System: A Web-Based Health Service Management Platform for the University of the Assumption

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## Abstract

This study presents the design, development, and evaluation of the UA Clinic System, a web-based platform developed to modernize healthcare services at the University of the Assumption. Using a mixed-methods approach, qualitative data were collected through surveys and interviews with clinic staff, students, and faculty to identify inefficiencies in manual clinic processes, while quantitative data were gathered using the ISO/IEC 25010 software quality standard and the Technology Acceptance Model (TAM) to evaluate system quality and user acceptance. The system was developed using the Agile Prototyping methodology and includes features such as digital patient registration, secure Electronic Medical Records (EMR), appointment scheduling, inventory monitoring with automated alerts, digital medical certificates, and an AI-powered chatbot called Nursebot. Evaluation results showed “Very High” ratings in terms of reliability, security, usability, and overall user acceptance. The study concludes that the UA Clinic System effectively improves clinic operations by providing a more efficient, secure, and organized healthcare management solution for the university.

**Keywords:** Electronic Medical Records (EMR), Inventory System, ISO/IEC 25010, Technology Acceptance Model (TAM)

## Introduction

### Background of the Study

The health and welfare of students, faculty, and staff are essential to maintaining a productive educational environment. School clinics play a significant role in providing healthcare services, but many institutions still depend on manual systems for patient registration, medical records, and inventory management. These

paper-based processes can cause delays, inefficiencies, and difficulties in managing accurate healthcare information. On a global scale, the use of Electronic Medical Records (EMR) has helped improve healthcare efficiency, record accuracy, and decision-making (WHO, 2021). Despite this progress, many schools and institutions in the Philippines continue to utilize manual documentation methods, which may result in slower operations and increased risk of data loss (Asuncion, 2022; Ongkeko Jr., 2024).

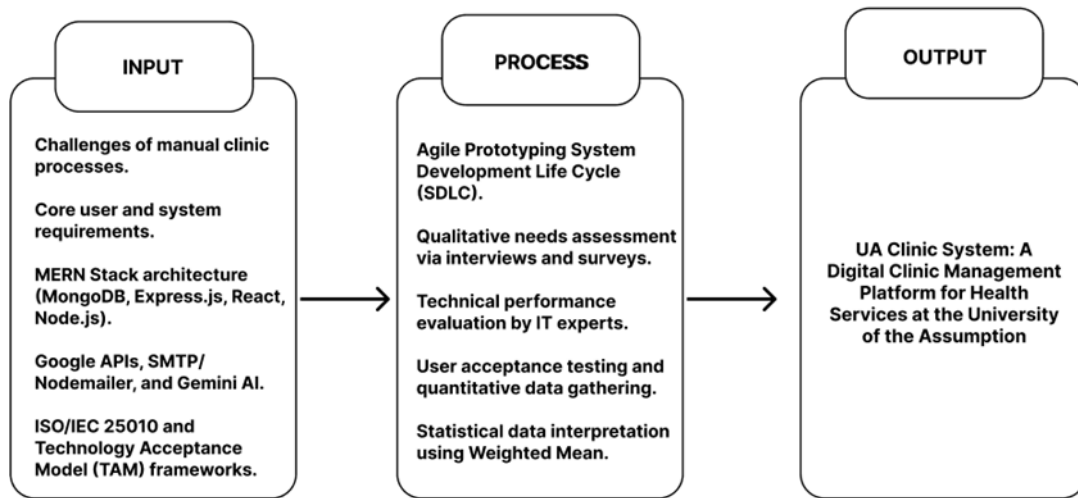
In response to these concerns, this study developed the UA Clinic System, a web-based platform intended to improve and centralize clinic operations at the University of the Assumption. The system digitizes patient records and reporting processes to reduce paperwork and administrative tasks. It also features an AI-powered chatbot named Nursebot that can assist users by answering common inquiries and providing basic health information anytime. By implementing a digital and data-driven approach, the UA Clinic System seeks to enhance the efficiency, accuracy, and overall quality of healthcare services within the university community (Janett & Yeracaris, 2020; Torkman et al., 2025).

### **Objectives of the Study**

This study aims to design, develop, and evaluate the UA Clinic System as a digital clinic management platform for the University of the Assumption. Specifically, it seeks to identify the limitations of the existing manual clinic processes and determine the core system requirements based on qualitative input from clinic staff, students, and faculty. It also aims to evaluate the technical quality and performance of the UA Clinic System using software quality criteria assessed by IT experts. Furthermore, the study assesses user acceptance of the system in terms of perceived usefulness, perceived ease of use, and behavioral intention to use based on the Technology Acceptance Model (TAM). Lastly, it aims to evaluate the overall effectiveness of the system by comparing pre-implementation challenges with post-implementation results in technical quality and user acceptance.

### **Conceptual Framework**

This study follows the Input-Process-Output (IPO) framework as a guide for both the system development and the overall research process. In the input stage, the researchers identified the issues present in the existing manual clinic operations, analyzed user requirements, and determined the technologies and hardware needed for the project, including the MERN stack. The process stage focused on the implementation of the Agile Prototyping methodology, which involved data gathering through surveys, system planning and design, prototype development, and software evaluation using the ISO/IEC 25010 model and the Technology Acceptance Model (TAM). The output of the study is the UA Clinic System, a web-based platform that offers digital medical records, inventory management, and an AI-powered chatbot called Nursebot to enhance healthcare services at the University of the Assumption.



**Figure 1. Conceptual Framework**

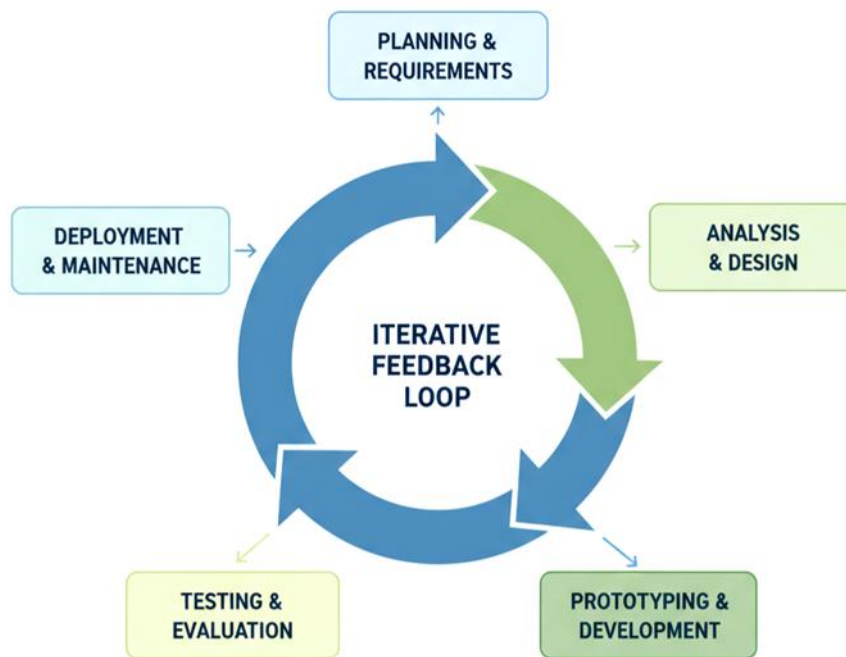
## Methods

### Research Design

This study utilized a mixed-methods research design that combined qualitative and quantitative approaches under a Descriptive-Evaluative and Developmental framework. The qualitative phase focused on conducting a needs assessment to determine the existing challenges and requirements of the clinic through surveys and semi-structured interviews with clinic staff, students, and employees. The information gathered was used as the foundation for the development of the system. Meanwhile, the quantitative phase involved evaluating the system through technical assessments conducted by IT experts using the ISO/IEC 25010 software quality standard, as well as user acceptance testing based on the Technology Acceptance Model (TAM). This research approach helped ensure that the developed system met both technical standards and the actual needs of the university community.

### System Development Methodology

The development of the UA Clinic System was guided by the Agile Prototyping Model to allow continuous improvements based on feedback from university stakeholders. The process consisted of five main phases: planning and requirement gathering to identify the project scope and user needs, analysis and system design for creating the system architecture and interface layouts, and prototyping and development for building and refining the platform. After development, the system underwent testing and user feedback collection to evaluate its technical quality and user acceptance before proceeding to deployment and implementation. This approach helped ensure that the final system was reliable, functional, and aligned with the needs of both clinic personnel and students.



**Figure 2. Agile Prototyping System Development Life Cycle (SDLC)**

## Participants and Setting

The participants of this study were selected from the University of the Assumption and represented the primary users and stakeholders of the university clinic. The respondents included five IT professionals who served as technical evaluators, clinic personnel such as nurses and doctors involved in daily clinic operations, and a stratified random sample of students and faculty members who regularly use clinic services. The study was conducted at the University of the Assumption clinic, where manual documentation and record management processes are commonly practiced. Their participation enabled the researchers to evaluate the system from both technical and user-centered perspectives.

## Participants

The study employed three main research instruments to collect detailed data. The first instrument was a Qualitative Needs Assessment Survey composed of open-ended questions aimed at identifying the challenges and system requirements experienced by clinic staff and students. The second was an Expert Evaluation Questionnaire, which used a Likert-scale format based on the ISO/IEC 25010 software quality model to assess the system’s technical performance and acceptance from IT professionals. The third instrument was a User Evaluation Questionnaire given to students, faculty, and staff, which integrated relevant ISO/IEC 25010 quality attributes and TAM constructs to evaluate perceived usefulness and ease of use from the end-user perspective.

## Data Collection Procedure and Analysis

The data collection process started with obtaining official approval from the clinic head to conduct the study. Qualitative data were first gathered through interviews to identify and define the system’s functional requirements. After the system was developed, participants were asked to use the platform before

completing the evaluation surveys. The qualitative responses were analyzed using thematic analysis to identify and group common issues and concerns. On the other hand, the quantitative data were processed using descriptive statistical tools, specifically weighted mean and standard deviation, to assess the system's software quality and level of user acceptance.

## **Results and Discussions**

The UA Clinic System effectively resolved several limitations commonly associated with manual clinic operations, including slow retrieval of records, inefficient inventory tracking, and delays in reporting. Based on the ISO/IEC 25010 evaluation, the system achieved very high results in key quality attributes such as security, performance efficiency, and functional suitability, indicating its dependability for managing campus healthcare services. Meanwhile, the Technology Acceptance Model (TAM) results showed very high user acceptance, with participants rating the system as useful, easy to navigate, and appropriate for daily clinic tasks. Overall, the findings demonstrate that the UA Clinic System successfully transformed traditional paper-based processes into a secure, efficient, and widely accepted digital solution that improves healthcare service delivery at the University of the Assumption.

## **Operational Challenges in the University of the Assumption Clinic**

The qualitative analysis revealed several operational challenges in the current clinic setup, including reliance on manual record-keeping, poor visibility of clinic resources, inefficient patient tracking, and delays in generating reports. Patient data and consultation records are still stored in paper-based logbooks, which makes retrieval time-consuming, increases the risk of errors, and limits quick access to medical history. These issues reduce the clinic's capacity to deliver timely and accurate healthcare services, particularly during busy periods.

Moreover, the absence of a centralized system affects the proper monitoring of medical supplies, appointment scheduling, and daily clinic activities. Manual procedures often result in scheduling conflicts, unclear patient flow, and difficulty in producing consolidated reports for decision-making. These limitations highlight the need for a unified digital platform. The UA Clinic System was developed to address these problems by centralizing patient records, enabling real-time appointment scheduling, improving inventory tracking, and automating report generation, ultimately enhancing the efficiency, accuracy, and reliability of clinic operations.

## **System Quality Assessment (ISO/IEC 25010)**

IT experts assessed the technical performance of the UA Clinic System using the ISO/IEC 25010 standard to verify its reliability and suitability for use in a campus healthcare setting.

**Table 1 Overall Summary of ISO 25010**

ISO 25010	Mean	SD	Verbal Interpretation
Functional Suitability	3.33	0.60	Very High
Performance Efficiency	3.47	0.52	Very High
Compatibility	3.73	0.33	Very High
Usability	3.73	0.48	Very High
Reliability	3.33	0.48	Very High
Security	3.73	0.37	Very High
Maintainability	3.33	0.51	Very High
Portability	3.40	0.51	Very High
<b>Average</b>	<b>3.50</b>	<b>0.86</b>	<b>Very High</b>

Table I shows the results of the technical evaluation conducted by IT experts, which yielded an overall “Very High” rating with a grand mean of 3.50 and a standard deviation of 0.86. The highest-rated areas were Compatibility, Usability, and Security, each with a mean score of 3.73, indicating strong system integration, ease of use, and effective data protection. Performance Efficiency also received a high rating (M = 3.47), reflecting stable system operation and efficient use of resources. Overall, the results confirm that the UA Clinic System complies with the ISO/IEC 25010 standard and provides a dependable and secure platform for managing university health services.

**User Acceptance Evaluation (Technology Acceptance Model)**

The system’s adoption and acceptance were evaluated using the Technology Acceptance Model (TAM), based on feedback from clinic staff, students, and faculty members.

**Table 2 Technology Acceptance of the UA Clinic System**

Technology Acceptance Model (TAM)	Mean	SD	Verbal Interpretation
Perceived Usefulness	3.57	0.55	Very High
Perceived Ease of Use	3.61	0.56	Very High
Behavioral Intention To Use	3.61	0.54	Very High
<b>Average</b>	<b>3.60</b>	<b>0.56</b>	<b>Very High</b>

Table II presents the level of system acceptance among end-users, showing an overall “Very High” rating with a grand mean of 3.60 and a standard deviation of 0.55. Respondents agreed that the system is easy to use and navigate with minimal assistance (M = 3.61). The Perceived Usefulness score (M = 3.57) shows that users believe the platform improves efficiency and reduces errors compared to manual processes. Additionally, the high Behavioral Intention to Use rating (M = 3.61)

indicates a strong willingness among the university community to continue using and adopting the system in clinic operations.

### Evaluation of System Effectiveness and Impact

To evaluate the system’s effectiveness, the study compared the inefficiencies observed before implementation with the outcomes after deployment. Table III presents a mapping of the identified manual process issues and their corresponding digital solutions, along with the associated validation metrics.

**Table 3 Comparative Analysis of Pre-Implementation Challenges vs. System Effectiveness**

Pre-Implementation Challenge	System Solution	Post-Implementation Effectiveness
<b>Manual Record Handling:</b> Slow data retrieval and redundancy due to paper logbooks.	<b>Digital EMR:</b> Centralized, searchable database with bulk export.	<b>Perceived Usefulness (3.57):</b> Validated faster task completion and increased productivity.
<b>Data Security Risks:</b> Vulnerability to unauthorized viewing and physical damage.	<b>Role-Based Access:</b> Encrypted data handling restricted to verified @ua.edu.ph accounts.	<b>Security (3.73):</b> Confirmed robust protection against unauthorized access.
<b>Limited Resource Visibility:</b> Absence of real-time monitoring for low or expiring medical stocks.	<b>Inventory Tracking:</b> Real-time monitoring with automated email alerts.	<b>Reliability (3.33):</b> Verified consistent accuracy in asset tracking.
<b>Inefficient Patient Flow:</b> Manual queuing leading to scheduling conflicts.	<b>Nursebot &amp; Appointments:</b> 24/7 AI-powered triage and digital scheduling tools.	<b>Perceived Ease of Use (3.61):</b> Validated high usability and intuitive interface design.

The following figures illustrate the developed modules of the UA Clinic System, highlighting how each feature specifically addresses the operational gaps listed in Table 3.

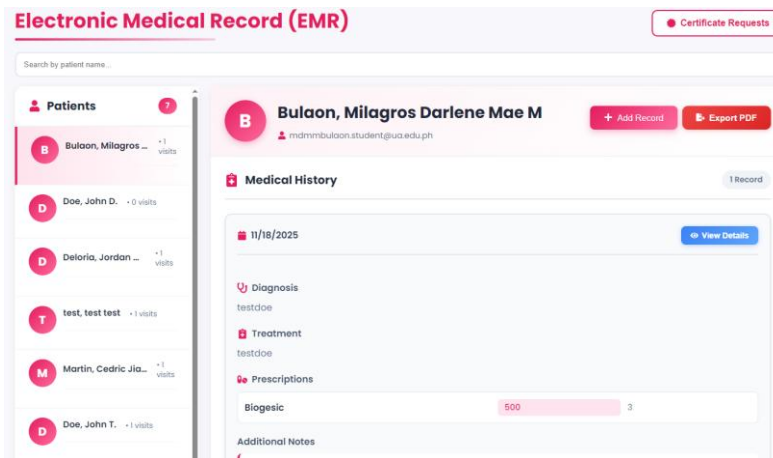


Figure 3. Electronic Medical Record (EMR)

The **Electronic Medical Record (EMR)** replaces slow, redundant manual logbooks with a centralized, searchable database, addressing inefficient record retrieval. Its effectiveness is shown by a Perceived Usefulness score of 3.57, validating faster task completion than manual methods. The system also achieved a Security rating of 3.73, confirming better protection than paper files.

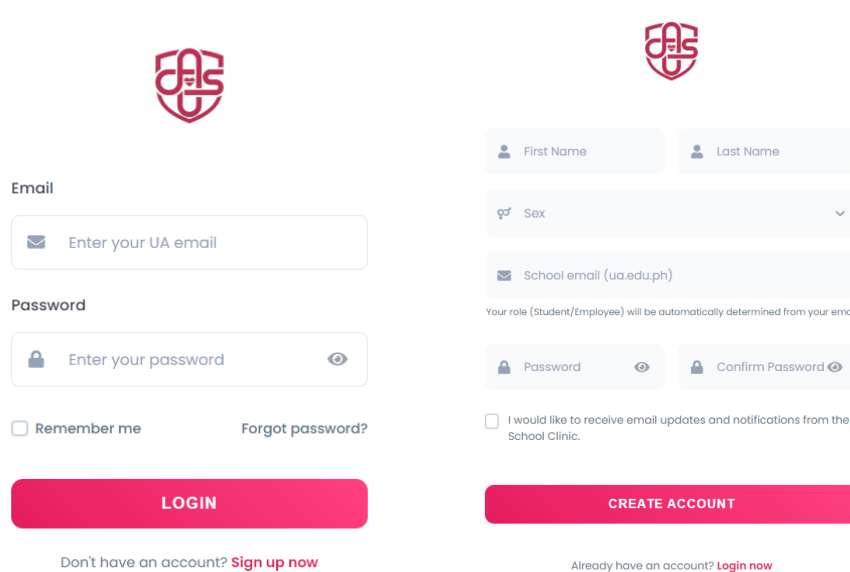
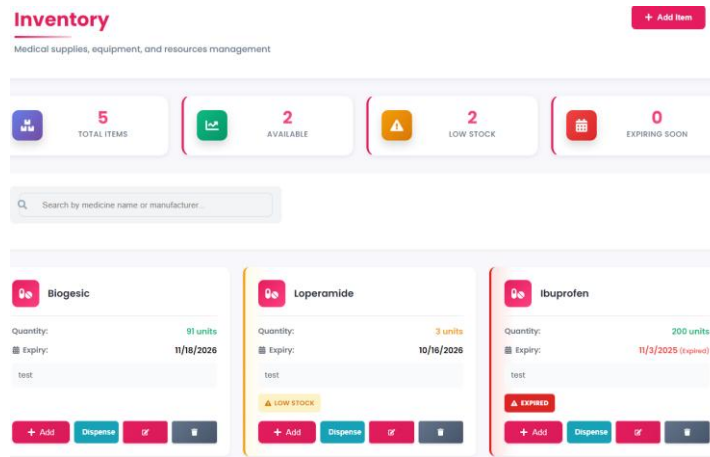


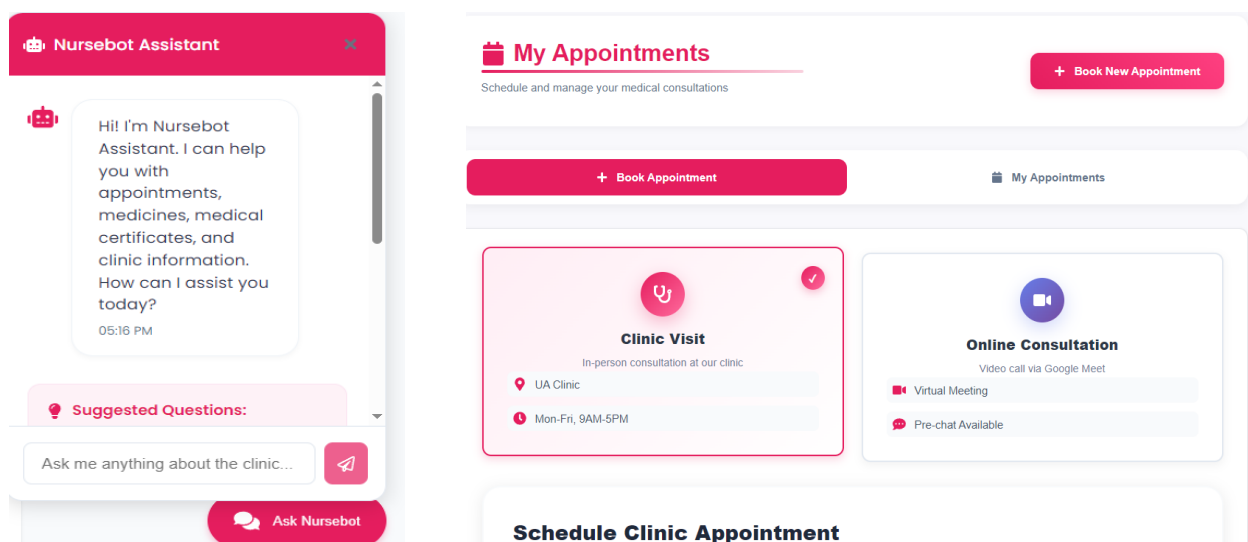
Figure 4. Registration and Login

The **Registration** and **Login** interfaces address data security risks by restricting access to verified @ua.edu.ph accounts and implementing role-based access control. This ensures users can only access functions appropriate to their role and serves as a strong first line of defense against unauthorized access and data misuse. The feature achieved a Security rating of 3.73, the highest among technical criteria, demonstrating stronger protection than paper-based logbooks.



**Figure 5. Inventory Management**

**Inventory Management Page** resolves limited resource visibility by replacing manual stock-taking with a real-time digital monitoring system. Previously, the clinic lacked centralized tracking for medical supplies, leading to inefficient monitoring. This solution is validated by a Reliability score of 3.33 and a Functional Suitability score of 3.33, confirming that the system provides consistent, accurate tracking of clinic assets. As shown in the Inventory interface, the platform provides immediate visibility through status cards for total items and low-stock warnings, transforming a formerly unmonitored process into a proactive, data-driven workflow.



**Figure 6. Nursebot Assistant and Appointment**

The **Nursebot Assistant** and digital appointment tools resolve inefficient patient flow and manual queuing conflicts by centralizing access to clinic services. The Nursebot provides 24/7 automated guidance, while the **Appointment Page** allows students and faculty to schedule visits digitally to avoid overlaps in manual

processes. This combined solution is validated by a Perceived Ease of Use score of 3.61 and a Perceived Usefulness score of 3.57, confirming faster navigation of booking and information than traditional methods. These tools ensure a more organized campus healthcare experience by streamlining the scheduling workflow.

## Conclusion

The development and implementation of the UA Clinic System mark an important step toward modernizing healthcare services at the University of the Assumption by shifting from traditional manual processes to a more efficient, data-driven digital platform. The study addressed key operational issues such as delayed record retrieval, ineffective inventory monitoring, and appointment scheduling conflicts by replacing paper-based logbooks with secure Electronic Medical Records (EMR) and automated management tools. Technical evaluation results from IT experts using the ISO/IEC 25010 standard produced an overall “Very High” rating, with particularly strong scores in security, usability, and compatibility, confirming the system’s reliability in a campus healthcare setting.

In addition, the Technology Acceptance Model (TAM) results showed strong user acceptance, with students, faculty, and staff reporting very high levels of perceived usefulness and ease of use. Features like the AI-powered Nursebot and the online appointment system improved user experience by offering 24/7 assistance and minimizing scheduling issues. Overall, the UA Clinic System demonstrates effectiveness in improving data accuracy, processing speed, and operational transparency, serving as a practical model for digital transformation in school-based healthcare services.

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