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Eastern Visayas State University (EVSU) Registrar: e-Assist System

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Abstract

This study developed and evaluated the EVSU Registrar: e-Assist System to improve service efficiency, accessibility, and client satisfaction within the Registrar's Office of Eastern Visayas State University. Guided by the Input–Process–Output framework and supported by Natural Language Processing (NLP)-based chatbot technology, the system integrated online document requests, real-time transaction tracking, appointment scheduling, automated notifications, customer feedback collection, reports and analytics, FAQs, and chatbot assistance. A mixed-methods research design was employed, combining qualitative and quantitative approaches. Data were gathered through interviews, surveys, structured questionnaires, and system evaluations involving students, alumni, registrar personnel, and ICT personnel. Qualitative data were analyzed using thematic analysis, while quantitative data were evaluated using the ISO/IEC 25010 Software Quality Model. The findings revealed four major challenges affecting registrar operations: operational constraints and resource limitations, inefficient manual processes and records management, information accessibility concerns, and the increasing demand for service automation. The developed system addressed these issues by providing accessible self-service functionalities and improving information dissemination and transaction management. Evaluation results showed excellent performance across functionality, reliability, usability, efficiency, maintainability, portability, and security, with an overall weighted mean score of 4.74, indicating high user satisfaction and software quality. The study concluded that the EVSU Registrar: e-Assist System effectively enhanced service delivery, reduced reliance on manual processes, and supported data-driven decision-making. It is recommended that the system be implemented and continuously improved through user feedback, regular monitoring, and periodic updates. The study supports Sustainable Development Goal (SDG) 4 by improving access to educational services, SDG 9 through the adoption of innovative digital technologies, and SDG 16 by promoting transparency, accountability, and efficient institutional services. Its sustainability impact lies in strengthening institutional efficiency, technological modernization, and continuous quality improvement within higher education service delivery.

Keywords: Accessibility, Appointment Scheduling, Chatbot Technology, Natural Language Processing, Registrar Services, Service Automation, Transaction Tracking

1. Introduction

The increasing demand for efficient, accessible, and technology-driven services has encouraged higher education institutions to adopt digital solutions that improve administrative processes and client satisfaction. As Eastern Visayas State University (EVSU) advances its Smart Campus initiative, the Registrar's Office continues to handle a high volume of document requests and client transactions. However, existing processes remain largely manual, limiting operational efficiency, service monitoring, and data-driven decision-making. This study proposes the development of a Web-Based Registrar e-Assist System integrating online requests, transaction tracking, automated notifications, customer feedback, analytics, appointment scheduling, and Natural Language Processing (NLP)-based chatbot technology to improve accessibility, efficiency, and service quality.

1.1 Background of the EVSU Registrar e-Assist System for Service Accessibility and Efficiency

Eastern Visayas State University (EVSU) serves more than 20,000 enrolled students across its campuses and produces approximately 3,000 graduates annually. Despite the large number of clients, the Registrar's Office operates with only nine personnel responsible for document processing, student requests, and record verification. The increasing competitiveness of educational institutions has highlighted the importance of integrating Information and Communication Technologies (ICT) to improve service delivery and operational efficiency (Dzhumaevich, 2024). Likewise, digital government initiatives have demonstrated that technology can provide information and services more conveniently and cost-effectively (Ni & Ho, 2005; Wang & Shih, 2009). As part of its Smart Campus initiative, EVSU has implemented several digital systems; however, registrar services remain insufficiently automated. Client satisfaction monitoring, service quality assessment, and operational reporting continue to rely on manual processes. The number of requested academic documents increased from 68,105 in 2024 to 78,351 in 2025, contributing to longer processing times and increased workloads. To address these challenges, the proposed system integrates online document requests, appointment scheduling, transaction

tracking, automated notifications, customer feedback collection, and chatbot-assisted information retrieval to improve service accessibility and operational efficiency.

1.2 Themes and Insights from Related Literature on Registrar Service Digitalization

Literature highlights the growing role of Natural Language Processing (NLP) and chatbot technologies in improving service accessibility and information dissemination. NLP enables computers to understand and generate human language through linguistic, statistical, and artificial intelligence techniques (Fanni, Febi, Aghakhanyan, & Neri, 2023). Chatbots supported by NLP provide automated responses that improve user interaction and reduce reliance on manual assistance (Brown, et al., 2020). Studies have shown the effectiveness of online request systems in educational institutions. Bacud & Siddayao (2024) reported that online academic record request systems improve efficiency, accessibility, and security while meeting ISO 25010 software quality standards. Similarly, Lingaya (2019) emphasized the importance of document tracking systems in enhancing transparency, accountability, and operational efficiency. The implementation of a Digital Document Request and Tracking System at Visayas State University further demonstrated the benefits of real-time monitoring and digital processing of requests (Alviola, 2024). Automated notification systems also contribute to effective information dissemination by providing timely updates and reducing operational costs (Sanmorino & Fajri, 2018). Moreover, feedback analysis systems support continuous service improvement by identifying client concerns and satisfaction trends (Singhal, Chaudhary, & Vikas, 2023). Within higher education, AI-powered chatbots have proven valuable in enhancing communication and accessibility. The AUST: Ask-UST Chatbot significantly improved information dissemination and administrative support within the University of Santo Tomas (Ballesteros, Lazaro, Rosal, Sobreviga, & Domingo, 2025). Likewise, the University of Southeastern Philippines developed “SePhi,” an AI-based information assistant capable of providing real-time responses and customer satisfaction monitoring.

1.3 Local, National, and Global Context of Digital Registrar Services

Globally, educational institutions increasingly utilize ICT, AI, and automated systems to improve service delivery and administrative efficiency (Dzhumaevich, 2024; Wang & Shih, 2009). Nationally, universities in the Philippines have implemented online request systems, document tracking platforms, and AI-powered chatbots to streamline transactions and improve stakeholder experiences (Bacud & Siddayao, 2024; Alviola, 2024; Ballesteros, Lazaro, Rosal, Sobreviga, & Domingo, 2025). Locally, EVSU's Smart Campus initiative reflects its commitment to digital transformation. However, registrar operations continue to face challenges related to manual service monitoring, client satisfaction assessment, and transaction management. These conditions justify the development of an integrated registrar assistance platform specifically designed to address institutional needs.

1.4 Input–Process–Output Concept and NLP-Based Framework for Registrar Assistance

The study adopts an Input–Process–Output (IPO) framework integrated with Natural Language Processing (NLP) technology. User inputs include credentials, service requests, inquiries, feedback, and complaints. These inputs are processed through system modules such as online request portals, transaction tracking dashboards, automated notifications, customer feedback mechanisms, analytics, FAQs, and chatbot services. NLP serves as the foundation of the chatbot component by enabling the system to interpret user queries and generate relevant responses through processes including text preprocessing, tokenization, feature selection, model training, deployment, evaluation, and continuous improvement (Fanni, Febi, Aghakhanyan, & Neri, 2023). The expected outputs include efficient service delivery, improved accessibility, real-time transaction monitoring, enhanced client satisfaction, and reduced congestion within the Registrar’s Office.

1.5 Research Gaps and Rationale for Developing the EVSU Registrar e-Assist System

Although previous studies demonstrated the effectiveness of online request systems, document tracking platforms, automated notifications, customer feedback analytics, and chatbot technologies, these solutions are often implemented independently and focus on specific administrative functions. Existing literature reveals limited integration of these features into a single registrar assistance platform tailored to higher education institutions. At EVSU, the absence of an integrated digital registrar system limits operational efficiency, client satisfaction monitoring, and data-driven decision-making. The increasing volume of document requests further highlights the need for a centralized platform that combines service requests, tracking, automated communication, feedback analysis, appointment scheduling, and AI-assisted information retrieval. Therefore, this study addresses an institutional gap by developing a comprehensive Web-Based Registrar e-Assist System and evaluating it using ISO software quality standards.

1.6 Alignment with Relevant Sustainable Development Goals (SDGs)

The development of the EVSU Registrar e-Assist System aligns with several Sustainable Development Goals (SDGs) by promoting accessible, efficient, and technology-driven educational services. Specifically, the study supports SDG 4 (Quality Education) by improving access to essential academic services such as document requests, transaction tracking, and information dissemination, thereby enhancing students' educational experience. It also aligns with SDG 9 (Industry, Innovation and Infrastructure) through the integration of web-based technologies, automated processes, and Natural Language Processing (NLP)-based chatbot assistance that modernize administrative operations within the university.

Furthermore, the study contributes to SDG 16 (Peace, Justice and Strong Institutions) by promoting transparency, accountability, and responsiveness through real-time transaction monitoring, automated feedback collection, and data-driven reporting mechanisms. Collectively, these initiatives support the university's digital transformation efforts while strengthening the quality and effectiveness of public service delivery in higher education.

1.7 Importance of the Study to Multidisciplinary Sustainability

The study contributes to institutional sustainability by strengthening administrative efficiency, improving service delivery, and supporting data-driven decision-making within the university. It promotes technological sustainability through the adoption of scalable digital solutions and AI-assisted services that can support long-term modernization efforts. The system also supports community and educational sustainability by providing students, employees, alumni, and other stakeholders with accessible, inclusive, and efficient registrar services. Through continuous feedback collection and performance monitoring, the study encourages a culture of quality improvement that contributes to sustainable governance and service excellence in higher education institutions.

2. Material and methods

2.1 Research Design

The study utilized a mixed-methods research design that combined quantitative and qualitative approaches to obtain a comprehensive assessment of the proposed web-based registrar assistance system. Quantitative data were gathered using an evaluation instrument based on the ISO/IEC 25010 Software Quality Model. This instrument was used to measure waiting times, transaction processing efficiency, functionality, reliability, usability, efficiency, maintainability, portability, and security. Qualitative data were collected through interviews, surveys, and user feedback and were analyzed using Thematic Analysis by Clarke and Braun (2006). The integration of both approaches enabled the study to evaluate not only the technical performance of the system but also users' perceptions regarding accessibility, usability, and overall satisfaction.

2.2 Locale of the Study

The study was conducted at the Office of the University Registrar of Eastern Visayas State University (EVSU) Main Campus in Tacloban City. The registrar's office was selected because it manages a high volume of student and alumni transactions, including enrollment-related concerns, academic record requests, and document processing. The research locale is situated within the university's administration area, where registrar operations are centralized. The selection of this site was justified by the institution's large student population and the increasing demand for registrar services, which often result in long queues and manual processing delays. These conditions provided an appropriate setting for assessing the need for an automated registrar assistance system.

2.3 Respondents of the Study

The respondents consisted of students, alumni, registrar personnel, and ICT personnel of Eastern Visayas State University. Students and alumni were included because they are the primary users of registrar services and could provide insights regarding accessibility, convenience, and transaction efficiency. Registrar personnel were selected because the system directly affects their daily operations and workload management. ICT personnel were included due to their responsibilities in system implementation, maintenance, compatibility assessment, and technical support. Collectively, these stakeholder groups provided a comprehensive evaluation of the system from both user and administrative perspectives.

2.4 Sample and Sampling Procedure

The study gathered data from selected stakeholders of the university, including students, alumni, registrar personnel, and ICT personnel who interacted with or evaluated the proposed system. Data collection involved surveys, structured questionnaires, interviews, and observations of existing registrar procedures. Respondents were selected based on their direct involvement with registrar services and their ability to provide relevant feedback regarding system functionality, accessibility, efficiency, and overall usability. The combination of multiple respondent groups ensured diverse perspectives and a comprehensive evaluation of the developed system.

2.5 Research Instrument

The study utilized the EVSU Quality Assurance Office Client Satisfaction Survey, an ISO/IEC 25010-based evaluation questionnaire, interview guides, and system-generated usage data. The instruments assessed service efficiency, accessibility, usability, functionality, reliability, efficiency, maintainability, portability, and security. System requirements were categorized into functional requirements, including user account management, document requests, transaction tracking, notifications, chatbot services, feedback mechanisms, and administrative functions, and non-functional requirements, which focused on performance, scalability, security, usability, maintainability, and regulatory compliance. The system design was further guided by process models, flowcharts, database structures, and system architecture diagrams to ensure efficient development and implementation.

2.6 Data Gathering Procedure

Data gathering began with surveys and structured questionnaires administered to students, alumni, registrar personnel, and ICT personnel to assess the efficiency, accessibility, and usability of current registrar services. Interviews were subsequently conducted with key registrar personnel to identify workflow limitations, transaction bottlenecks, and operational challenges. Following data collection, the system was developed using the SDLC methodology. During the planning and analysis phase, existing registrar processes and user needs were examined. The requirements phase involved gathering information from stakeholders through interviews, surveys, and observations to define both functional and non-functional requirements. During the design phase, wireframes, flowcharts, system diagrams, and database structures were developed to guide implementation. The development phase focused on programming and integrating the system modules, including document requests, transaction tracking, automated notifications, customer feedback, analytics, appointment scheduling, FAQs, and chatbot services. The system was developed using TypeScript, Laravel Framework, PHP, MySQL, Composer, NPM, XAMPP, and supporting libraries. After development, testing procedures were conducted to evaluate functionality, response times, transaction processing, and user experience. Feedback obtained during testing was used to refine the system. The deployment phase involved releasing a staging version for review before integrating the final system into the EVSU website. Maintenance activities included monitoring system performance, reviewing user feedback, and implementing improvements based on usage data and evaluation results.

2.7 Data Analysis Techniques

Quantitative and qualitative techniques were employed to analyze the collected data. Quantitative analysis focused on system performance indicators and software quality characteristics measured through the ISO/IEC 25010 evaluation framework. These included functionality, reliability, usability, efficiency, maintainability, portability, and security. Descriptive statistics were used to summarize responses from the survey instruments and evaluate overall system performance. Qualitative analysis employed Thematic Analysis by Clarke and Braun (2006) to examine interview responses, user comments, and feedback. This method facilitated the identification of recurring themes, accessibility concerns, service delivery issues, and recommendations for improvement. Findings from both quantitative and qualitative analyses were integrated to provide a comprehensive assessment of the effectiveness, accessibility, and usability of the EVSU Registrar: e-Assist System.

3. Results and Discussion

3.1 Development and Implementation of the EVSU Registrar: e-Assist System

3.1.1 Online Document Request and Transaction Tracking

The developed system enabled clients to request academic documents online by providing personal information and uploading the required supporting documents for verification. The system also allowed users to choose between document pickup and delivery. In addition, clients could monitor the real-time status of their requests, view transaction details, access submitted documents, and receive automated notifications regarding processing updates. These features improved accessibility and transparency by reducing the need for repeated office visits and manual follow-ups. The availability of real-time updates ensured that users remained informed throughout the transaction process, contributing to a more efficient and convenient registrar service.

3.1.2 Appointment Scheduling and Information Accessibility

The system provided an online appointment scheduling feature that allowed clients to select preferred dates and available time slots before visiting the registrar's office. Users could also modify or reschedule appointments and monitor the status of their scheduled transactions. The appointment management feature addressed concerns related to overcrowding and long queues. By organizing client visits and providing greater scheduling flexibility, the system enhanced service accessibility while promoting a more structured and efficient workflow within the registrar's office.

3.1.3 Feedback Monitoring and System Analytics

The system incorporated centralized reports, feedback management, and analytics modules. Administrators could monitor user evaluations, reported concerns, suggestions, and service ratings through a unified dashboard. The analytics component tracked operational metrics such as document requests, processing activities, account distribution, processing trends, and user feedback. These features supported evidence-based decision-making by providing administrators with real-time information regarding service performance and client satisfaction. The availability of analytical reports enabled the registrar's office to identify recurring concerns, evaluate service quality, and implement continuous improvements.

3.2 Challenges Experienced by the EVSU Registrar's Office

3.2.1 Operational Constraints and Resource Limitations

The findings revealed that registrar personnel experienced challenges related to limited staffing, increasing workloads, and seasonal surges in transactions, particularly during enrollment and graduation periods. Participants reported difficulties

managing multiple responsibilities simultaneously, including document processing, student registration, record verification, and client assistance. Students and alumni also associated delays with periods of high transaction volume. These results indicate an imbalance between service demand and available human resources. The increasing volume of requests places significant pressure on personnel, which affects processing speed and overall service efficiency. The findings demonstrate the need for technological interventions that can automate routine processes and reduce administrative burdens.

3.2.2 Inefficient Manual Processes and Records Management

Respondents identified manual document retrieval and paper-based record management as major contributors to processing delays. Registrar personnel reported difficulties locating physical records, while students and alumni described document requests as lengthy and stressful due to multiple procedural requirements. The findings suggest that reliance on manual systems limits operational efficiency and prolongs service delivery. The continued use of physical records increases retrieval time and workload, highlighting the importance of digitized records management and automated transaction processing.

3.2.3 Information Accessibility Concerns

Both registrar personnel and clients reported challenges in obtaining and disseminating information related to registrar services. Personnel frequently handled repetitive inquiries, while students and alumni expressed uncertainty regarding the status of their document requests and service requirements. These results indicate the absence of a centralized information management platform. The lack of accessible updates and automated communication channels contributes to repeated inquiries, additional office visits, and delays in completing transactions. Improving information accessibility is therefore essential in enhancing service efficiency.

3.2.4 Demand for Service Automation

Participants consistently recommended the implementation of automated registrar services. Suggested features included online document requests, real-time tracking, appointment scheduling, automated notifications, online payment options, frequently asked questions, and integrated service platforms. The findings demonstrate strong stakeholder support for digital transformation within the registrar's office. The recommendations directly correspond to the features incorporated into the EVSU Registrar: e-Assist System, indicating that the developed system effectively addresses identified operational challenges and service gaps.

3.3 Software Quality Evaluation of the EVSU Registrar: e-Assist System

3.3.1 Functionality, Reliability, and Usability

The system received excellent ratings for functionality, reliability, and usability, with weighted mean scores of 4.80, 4.76, and 4.74, respectively. Respondents indicated that the system effectively met functional requirements, provided accurate chatbot responses, displayed correct transaction updates, operated consistently, and offered an easy-to-understand interface. These findings suggest that the system successfully fulfilled its intended purpose while maintaining dependable performance and user-friendly operation. The positive evaluations indicate that the developed platform effectively supports registrar transactions and promotes a satisfactory user experience.

3.3.2 Efficiency, Maintainability, and Portability

The system achieved excellent ratings in efficiency, maintainability, and portability, obtaining weighted mean scores of 4.77, 4.60, and 4.65, respectively. Respondents reported that transactions could be completed more quickly than manual processes, system updates could be implemented easily, and the platform functioned effectively across various devices and browsers. The results demonstrate that the web-based architecture contributes to operational efficiency and broad accessibility. The ability to operate across multiple technological environments and adapt to future updates enhances the system's long-term usability and sustainability.

3.3.3 Security and Overall User Satisfaction

Security received an excellent weighted mean score of 4.77, while overall user satisfaction obtained a weighted mean score of 4.85. Respondents expressed confidence in the system's data protection mechanisms, authentication features, and overall performance. Users also indicated strong willingness to recommend the system for official implementation. These findings reflect a high level of trust and acceptance among stakeholders. Strong security measures and positive user experiences contribute significantly to system credibility, supporting its adoption as an official registrar service platform.

3.4 Overall Assessment of the EVSU Registrar: e-Assist System

The overall assessment of the EVSU Registrar: e-Assist System resulted in an excellent rating with a combined weighted mean score of 4.74. Positive evaluations were consistently observed across functionality, reliability, usability, efficiency, maintainability, portability, and security. The results confirm that the system effectively addresses the operational challenges identified during the qualitative investigation. By improving information dissemination, reducing manual

processes, enhancing accessibility, and supporting efficient transaction management, the system demonstrates its potential to significantly improve registrar service delivery and client satisfaction within Eastern Visayas State University.

4. Conclusion and Recommendations

The study successfully developed the EVSU Registrar: e-Assist System to improve service efficiency, accessibility, and client satisfaction within the EVSU Registrar's Office. The system provided self-service features including online document requests, real-time transaction tracking, appointment scheduling, automated feedback collection, reports and analytics, chatbot assistance, and FAQ support. Thematic analysis revealed that existing registrar services were affected by operational constraints, manual processes, information accessibility issues, and the increasing demand for automation. Evaluation results demonstrated that the system achieved an overall excellent rating, confirming its effectiveness in meeting user needs and software quality standards in terms of functionality, reliability, usability, efficiency, maintainability, portability, and security.

It is recommended that the EVSU Registrar: e-Assist System be implemented within the Registrar's Office and continuously improved through user feedback and practical application. Users should maximize the available self-service features to reduce manual transactions and improve service efficiency. Regular review of user evaluations, comments, and feedback should be conducted to identify areas for improvement and enhance service quality. Registrar personnel should utilize the reports and analytics module to support performance monitoring and decision-making. Continuous system evaluation, periodic updates, performance monitoring, and security assessments should also be conducted to maintain system quality, reliability, security, and efficiency.

The study was limited to the development and evaluation of the EVSU Registrar: e-Assist System within the EVSU Registrar's Office and focused on selected respondents consisting of registrar personnel, students, alumni, and ICT personnel. The evaluation primarily measured the system's quality based on ISO/IEC 25010 standards and user feedback gathered during the study period. As such, the findings were limited to the implemented features, identified registrar processes, and the operational environment in which the system was evaluated.

Compliance with ethical standards

The authors declare no conflict of interest. This study received no external funding and was conducted as part of the development and evaluation of the EVSU Registrar: e-Assist System at Eastern Visayas State University. Participation of registrar personnel, students, alumni, and ICT personnel was voluntary, and informed consent was obtained prior to data collection through non-invasive methods such as surveys, interviews, and system evaluations. All information gathered was treated with confidentiality, and no personally identifiable information was disclosed in the reporting of the findings.

REFERENCES

Alviola, U. B. (2024). *ICTMC pioneers online document tracking system for registrar services*.

Bacud, A. S., & Siddayao, G. P. (2024). Online request system for the issuance of school academic records of Maila Rosario College. *AIDE Interdisciplinary Research Journal*.

Ballesteros, Y. J., Lazaro, K. A., Rosal, G. E., Sobreviga, V. R., & Domingo, M. J. (2025). AUST: Ask–UST chatbot for UST–ICT. *IET Conference Proceedings*.

Brown, T., Mann, B., Ryder, N., Subbiah, M., Kaplan, J. D., Dhariwal, P., & Amodei, D. (2020). Language models are few-shot learners. *Advances in Neural Information Processing Systems*.

Dzhumaevich, U. B. (2024). Use of ICT in universities. *International Conference on Interdisciplinary Science*.

Fanni, S. C., Febi, M., Aghakhanyan, G., & Neri, E. (2023). *Introduction to artificial intelligence*. Springer International Publishing.

Feuerriegel, S., Maarouf, A., Bar, D., Geissler, D., Schweisthal, J., Pröllochs, N., . . . Van Bavel, J. (2025). *Using natural language processing to analyse text data in behavioural science*. Springer Nature.

Lingaya, S. R. (2019). Towards a bespoke document tracking system for Philippine higher educational institutions. *International Journal of Recent Technology and Engineering (IJRTE)*.

Ni, A. Y., & Ho, A. T.-K. (2005). Challenges in e-government development: Lessons from two information kiosk projects. *Government Information Quarterly*.

Sanmorino, A., & Fajri, R. M. (2018). The design of notification system on Android smartphone for academic announcement. *International Journal of Interactive Mobile Technologies (iJIM)*.

Singhal, P., Chaudhary, B., & Vikas. (2023). Improving feedback analysis: Deep learning approach to college customer satisfaction assessments. *Multidisciplinary Science Journal*.

Wang, Y.-S., & Shih, Y.-W. (2009). Why do people use information kiosks? A validation of the unified theory of acceptance and use of technology. *Government Information Quarterly*.

Wirth, R., & Hipp, J. (2000). *CRISP-DM: Towards a standard process model for data*. Tübingen, Germany.