An Online Guidance Services and Alumni Engagement System for St. Nicolas College of Business and Technology

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Abstract—Manual and fragmented processes in guidance services and alumni engagement pose significant challenges to institutional efficiency and service quality in higher education. This study presents the design, development, and evaluation of an Online Guidance Services and Alumni Engagement System for St. Nicolas College of Business and Technology (SNCBT) in the City of San Fernando, Pampanga, Philippines. The system was developed using a descriptive-developmental research design and structured following the Waterfall Model. It integrates six core modules: (1) faculty–student evaluation, (2) counseling appointment and online counseling, (3) student data management, (4) announcements and communication, (5) alumni registration and employment tracking, and (6) job opportunity posting. The system was built using HTML, CSS, JavaScript, PHP, and MySQL, and deployed via Hostinger. System quality was evaluated by 259 respondents—comprising students, alumni, faculty members, deans, and guidance personnel—using the ISO/IEC 25010 Software Quality Model. Performance testing yielded an average page load time of 1.8 seconds and a 100% module functionality success rate. The overall evaluation yielded a weighted mean of 4.50 (Strongly Agree), with performance efficiency receiving the highest rating of 4.54. The results confirm that the system effectively addresses the identified institutional problems and meets established software quality standards, providing a centralized, accessible, and sustainable digital platform for student support and alumni engagement.

***Index Terms*— alumni engagement, guidance services, ISO/IEC 25010, online counseling, web-based information system.**

1. Introduction

Educational institutions are expected not only to provide academic instruction but also to support students' personal development, behavioral management, career preparation, and transition to employment [1]. Two institutional services that significantly contribute to these goals are guidance and counseling services and alumni engagement. These functions enable schools to assist students throughout their academic stay, address academic and behavioral concerns, and maintain meaningful connections with graduates after program completion [2].

In the Philippine higher education system, guidance and counseling services are mandated under Republic Act No. 9258, otherwise known as the Guidance and Counseling Act of 2004. The Commission on Higher Education likewise encourages higher education institutions to sustain alumni engagement and graduate outcome monitoring as part of institutional quality assurance and continuous improvement [3].

Despite these mandates, many private higher education institutions continue to rely on inefficient and fragmented manual processes in managing guidance services and alumni-related activities. These practices involve paper-based records, manual appointment scheduling, unstructured referral processes, and scattered communication channels, which result in delays, limited accessibility, and challenges in monitoring student concerns and graduate outcomes [2].

At St. Nicolas College of Business and Technology (SNCBT), located in the City of San Fernando, Pampanga, the existing processes for guidance services and alumni engagement remain largely manual and unintegrated. Students are required to visit the Guidance Office in person to request counseling appointments, while institutional announcements are disseminated through informal channels. The institution also lacks a structured faculty-to-guidance referral process ("papa-guidance"), a comprehensive multi-level evaluation mechanism, and a systematic platform for alumni employment tracking and communication.

Specifically, this study addresses the following problems: (1) inefficiencies in manual faculty–student evaluation processes, including the lack of support for multi-level evaluation; (2) challenges in counseling service accessibility, scheduling, and documentation; (3) limitations in the management of student-related data, including counseling records, incident reports, referral processes, and guardian information; (4) fragmented communication channels and insufficient coordination between the Guidance Office and the Office of Student Affairs (OSA); and (5) the absence of a systematic and centralized approach to alumni engagement and employment tracking.

In response to these concerns, this study developed an Online Guidance Services and Alumni Engagement System for SNCBT.

The main objective was to design and develop a centralized web-based platform integrating faculty–student evaluation, counseling services, student data management, announcements management, and alumni tracking. The system was evaluated using the ISO/IEC 25010 Software Quality Model in terms of functional suitability, performance efficiency, usability, reliability, and security [4].

Related studies affirm the need for and effectiveness of digital solutions in comparable contexts. Garcia [2] demonstrated that web-based guidance systems improve service delivery and reduce workload for guidance personnel. Santos [1] emphasized that digital transformation of student services significantly reduces administrative burden and improves stakeholder communication. Lopez [3] highlighted the value of structured alumni information systems in managing graduate records and supporting institutional decision-making. Kim and Park [4] showed that integrated student information systems improve operational efficiency and reduce redundancy. Johnson [5] confirmed that web-based counseling platforms improve accessibility and reduce the need for physical visits. Reyes et al. [6] established that online faculty evaluation systems improve data collection speed, accuracy, and reporting. Dela Cruz et al. [7] demonstrated that web-based counseling appointment systems reduce manual workload and enhance service efficiency. Cerolini et al. [8] confirmed through systematic review that both face-to-face and web-based counseling interventions improve student mental health and access to support. Tuna and Avci [9] highlighted the importance of system security, reliability, and usability in online counseling implementations. Brown et al. [10] reinforced the value of centralized alumni career tracking systems in strengthening institutional–graduate engagement.

2. Methodology

A. Research Design

This study employed a descriptive-developmental research design. The descriptive component involved identifying the existing conditions, challenges, and institutional needs of SNCBT with regard to guidance services and alumni engagement through a pre-development assessment. The developmental component involved the design, development, and evaluation of the proposed web-based system. This design is appropriate because it not only describes the current institutional processes but also provides a practical, technology-based solution to the identified problems.

B. System Development Methodology

The Waterfall Model was adopted as the software development methodology due to its sequential and systematic nature, which is appropriate for structured academic system development projects. The development process followed five sequential phases: requirements analysis, system design, system development, testing, and deployment and evaluation.

In the requirements analysis phase, data were collected through observation, consultation, and survey questionnaires distributed to students, guidance personnel, administrators, faculty members, and alumni. The findings revealed inefficiencies in evaluation processing, counseling access, communication, data management, and alumni tracking, which served as the basis for defining the system's functional and non-functional requirements.

The system design phase involved the development of the Context Diagram, Data Flow Diagram (DFD) at Level 0 and Level 1, system flowcharts for each user role, and the Entity Relationship Diagram (ERD). User interface layouts and system modules were planned to ensure usability, accessibility, and consistency across the platform.

During the system development phase, the web-based application was built using HTML, CSS, and JavaScript for the front-end interface; PHP for server-side scripting; and MySQL for database management, with Visual Studio Code as the integrated development environment. After development, the system underwent comprehensive testing to verify that all modules functioned correctly and met the specified requirements. The final system was deployed using Hostinger, making it accessible through standard desktop and mobile web browsers.

C. System Modules

The developed system integrates six core modules designed to address the identified institutional problems:

- Faculty–Student Evaluation Module: Allows students to evaluate faculty members and supports multi-level evaluation processes, including peer, self, and dean evaluation, with automated collection and aggregation of results.
- Counseling Appointment and Online Counseling Module: Allows students to request and schedule counseling sessions; enables guidance personnel to manage appointments and conduct online counseling.
- Student Data Management Module: Centralizes student-related information, including counseling records, referral documentation, incident reports, and guardian or emergency contact information.
- Announcements and Communication Module: Enables authorized personnel to disseminate institutional announcements and improves coordination between the Guidance Office and OSA.
- Alumni Registration and Employment Tracking Module: Allows alumni to update their employment status and maintain connection with the institution.
- Job Opportunity Module: Enables partner companies or authorized personnel to post job vacancies, allowing alumni to access available opportunities.

D. Respondents and Sampling Technique

The study utilized purposive sampling to select respondents who are directly involved in guidance services, evaluation processes, announcements, and alumni-related activities at SNCBT. A total of 259 respondents participated in both the pre-development assessment and the post-development system evaluation. These respondents were composed of 98 students, 98 alumni, 57 faculty members, 4 deans, and 2 guidance personnel. All respondents were informed of the purpose of the study, and their participation was voluntary. Data collected were treated with confidentiality and used solely for research purposes.

E. Research Instrument

A structured questionnaire based on the ISO/IEC 25010 Software Quality Model served as the primary data-gathering instrument. The questionnaire measured five quality characteristics: functional suitability, performance efficiency, usability, reliability, and security. Each item corresponded to specific system characteristics and allowed respondents to assess how well the system meets institutional needs. Responses were measured using a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). Content validity was established through review by selected information technology experts and academic professionals. Pilot testing was conducted to assess clarity, consistency, and reliability, and feedback was used to refine the instrument.

Table I. ISO/IEC 25010 Quality Characteristics and Criteria

Category	Criteria
Functional Suitability	Completeness, Correctness, Appropriateness
Performance Efficiency	Time Behavior, Resource Utilization
Usability	Operability, Learnability
Reliability	Availability, Fault Tolerance
Security	Confidentiality, Integrity

F. Statistical Treatment of Data

The weighted mean was used to measure and analyze respondent ratings for each system quality indicator. Responses were coded numerically and interpreted using the descriptive rating scale shown in Table II. In addition to quantitative data, qualitative feedback from respondents was analyzed using thematic data analysis, with themes aligned with the ISO/IEC 25010 quality characteristics.

Table II. ISO/IEC 25010 Evaluation Descriptive Rating Scale

Weighted Mean	Descriptive Rating
4.21 – 5.00	Strongly Agree
3.41 – 4.20	Agree
2.61 – 3.40	Neutral
1.81 – 2.60	Disagree
1.00 – 1.80	Strongly Disagree

3. Results And Discussion

A. Pre-Development Assessment Results

The pre-development assessment revealed that the existing institutional processes were widely perceived as inefficient and in need of system-based solutions. Students strongly agreed (mean ratings ranging from 4.54 to 4.85) that current faculty evaluation processes are inconvenient, counseling services are difficult to access, and the absence of a centralized announcement platform limits information reach. Alumni strongly agreed (means of 4.56 to 4.85) that they lack a structured platform for employment tracking and meaningful communication with the institution after graduation. Faculty members strongly agreed (means of 4.56 to 4.79) that existing evaluation and data management processes are repetitive, time-consuming, and inefficient. Deans and guidance personnel gave the highest ratings (means of 4.75 to 5.00), indicating that current processes have critical limitations and that a centralized digital solution is urgently needed. These findings confirmed the significance of the proposed system and provided a clear basis for its design and development.

B. System Performance Testing

Following deployment via Hostinger, the system was tested across multiple usage scenarios to evaluate its operational efficiency. Table III presents the page load time across all system modules.

Table III. Page Load Time Across System Modules

System Module	Load Time (seconds)
Login Page	1.2
Student Dashboard	1.6
Faculty Evaluation	1.8
Counseling Appointment	1.7
Announcements	1.5
Alumni Portal	1.9
Admin Reports	2.2
Average	1.8

The system achieved an average page load time of 1.8 seconds across all modules, which falls within the acceptable range of 1 to 3 seconds for web-based applications. The Admin Reports module recorded the highest load time at 2.2 seconds due to the volume of data being processed and aggregated, while the Login Page recorded the fastest response at 1.2 seconds. All results are within acceptable performance thresholds.

Table IV presents the database query performance metrics across key system operations.

Table IV. Database Query Performance Metrics

Operation	Execution Time (ms)
User Authentication	45
Student Record Retrieval	62
Evaluation Submission	78
Counseling Appointment Booking	55
Announcement Posting	48

Alumni Record Update	67
Report Generation	125

All database operations were executed within acceptable timeframes. Report generation recorded the longest execution time at 125 milliseconds due to data aggregation across multiple tables; however, this is considered acceptable for administrative functions that are not performed in real time. All other operations demonstrated efficient execution, indicating optimized database performance.

Module functionality testing confirmed that all six core modules achieved a 100% success rate, verifying that the system correctly and consistently performs all intended operations under tested conditions.

C. ISO/IEC 25010 Evaluation Results

The system was evaluated by all 259 respondents using the ISO/IEC 25010 quality model. The following subsections present and discuss the results for each quality characteristic.

1) Functional Suitability

Functional suitability refers to how well the system provides the features and functions required to perform tasks. The overall weighted mean for this characteristic was 4.48 (Strongly Agree). Among all modules, the announcements module received the highest individual rating at 4.54, indicating strong perceived effectiveness in information dissemination. The faculty evaluation module received a mean of 4.38, while the alumni tracking module received a mean of 4.51. These results confirm that the system provides complete, appropriate, and accurate functionalities for its intended operations.

2) Performance Efficiency

Performance efficiency assesses how well the system performs in terms of speed, response time, and ability to handle user requests without delays. This characteristic received the highest overall rating among all evaluated dimensions, with a weighted mean of 4.54 (Strongly Agree). The system's ability to handle multiple concurrent tasks received the highest individual rating at 4.59, reflecting strong performance under simultaneous usage conditions. These results are consistent with the quantitative performance testing findings and confirm that the system meets performance expectations for web-based applications.

3) Usability

Usability measures how easy, convenient, and intuitive the system is for users to learn and operate. The overall weighted mean for usability was 4.51 (Strongly Agree). High ratings across all usability indicators confirm that the system interface is user-friendly and well-designed, and that it does not require extensive training for effective use. Respondents consistently described the system as easy to navigate and understand, even for first-time users.

4) Reliability

Reliability refers to the system's ability to operate consistently and perform its functions correctly without errors or interruptions. The overall weighted mean for reliability was 4.48 (Strongly Agree). High ratings suggest that users trust the system to function correctly during use. The results confirm that the system is stable and dependable under normal operating conditions.

5) Security

Security assesses the system's ability to protect user accounts, personal information, and system data from unauthorized access. The overall weighted mean for security was 4.48 (Strongly Agree). Respondents perceived the system as secure and capable of protecting user data. High ratings across all security indicators confirm that the system provides effective role-based access control and adequately safeguards sensitive user information.

Table V summarizes the ISO/IEC 25010 evaluation results across all quality characteristics.

Table V. Summary of ISO/IEC 25010 Evaluation Results (n = 259)

Quality Characteristic	Weighted Mean
Functional Suitability	4.48
Performance Efficiency	4.54
Usability	4.51
Reliability	4.48
Security	4.48
Overall System Mean	4.50

The overall weighted mean of 4.50 falls within the 4.21–5.00 range, interpreted as Strongly Agree, confirming that the system meets the required quality standards and performs effectively across all evaluated dimensions. Performance efficiency obtained the highest mean at 4.54, followed by usability at 4.51, while functional suitability, reliability, and security all obtained consistent ratings of 4.48.

D. Qualitative Feedback

In addition to quantitative ratings, respondents provided qualitative feedback analyzed through thematic data analysis. Five major strengths were identified: (1) the system's centralized platform integrating multiple institutional services, which respondents described as improving accessibility and organization; (2) ease of use and an intuitive interface, with many respondents noting the system is operable even for first-time users; (3) time efficiency, as respondents highlighted that the system significantly reduces time and effort compared to manual processes; (4) anytime-anywhere accessibility, as the web-based platform allows users to access services without physical presence; and (5) overall institutional benefit, with most respondents expressing that the system is a useful and innovative solution for SNCBT.

Respondents also identified areas for improvement. Faculty members and administrators expressed concern about additional workload from manual data input and recommended incorporating automation features to reduce repetitive tasks. Suggestions were made to enhance mobile responsiveness, add automated notification features for announcements and counseling appointments, expand alumni networking

capabilities, optimize system performance during peak usage, and update and maintain the system continuously for long-term sustainability.

E. Discussion

The evaluation results demonstrate that the Online Guidance Services and Alumni Engagement System successfully achieve its primary objectives. The implementation of online counseling appointment scheduling and online counseling functionality removes physical and time constraints, directly addressing the identified counseling accessibility problems. With a functional suitability mean of 4.48 and a performance efficiency rating of 4.54 for the counseling module, students can now access guidance services conveniently and efficiently.

The centralized announcements module, which received the highest functional suitability rating of 4.54, effectively resolves the previously fragmented communication channels at SNCBT. The system also addresses the identified student data management limitations by providing centralized storage for counseling records, incident reports, referral data, and guardian information under a role-based access framework. The alumni tracking module's functional suitability mean of 4.51 confirms that the system successfully supports systematic graduate outcome monitoring and alumni engagement—an institutional function that was previously managed informally.

The faculty–student evaluation module, with a functional suitability mean of 4.38 and a 100% functionality success rate, resolves the inefficiencies of manual evaluation distribution, collection, and aggregation, while also introducing multi-level evaluation support—including peer, self, and dean evaluation—that was not previously available at the institution.

The system's overall ISO/IEC 25010 rating of 4.50 (Strongly Agree) is consistent with findings from related studies. Dela Cruz et al. [7] reported similar positive outcomes in their web-based counseling appointment system, highlighting improved accessibility and reduced manual workload. Reyes et al. [6] demonstrated comparable improvements in evaluation efficiency through online faculty evaluation systems. Brown et al. [10] confirmed that centralized alumni tracking systems strengthen institutional engagement with graduates. The results of this study align with and extend these findings by integrating multiple institutional services into a single unified platform, providing SNCBT with a more comprehensive and scalable digital solution.

The identified system limitations—including performance under high concurrent user load, incomplete mobile optimization, the absence of automated notifications, and limited external system integration—represent directions for future enhancement rather than fundamental weaknesses. These limitations do not significantly affect the system's core functionality, as confirmed by the high evaluation ratings and the 100% module success rate during testing.

4. Conclusion

This study presented the design, development, and evaluation of an Online Guidance Services and Alumni Engagement System for St. Nicolas College of Business and Technology. The system effectively addresses the identified institutional inefficiencies in faculty–student evaluation, counseling service delivery, student data management, institutional communication, and alumni engagement by integrating six core modules into a single centralized web-based platform.

System performance testing confirmed acceptable operational efficiency, with an average page load time of 1.8 seconds, database query execution times of under 125 milliseconds, and a 100% module functionality success rate. The ISO/IEC 25010 evaluation conducted among 259 respondents yielded an overall weighted mean of 4.50 (Strongly Agree), demonstrating high acceptance and satisfaction across all stakeholder groups. All five evaluated quality characteristics—functional suitability, performance efficiency, usability, reliability, and security—received Strongly Agree ratings, confirming that the system meets established international software quality standards.

Based on these findings, the following conclusions are drawn: (1) the automated evaluation module effectively eliminates manual processing inefficiencies; (2) online counseling scheduling significantly improves service accessibility by removing physical and time constraints; (3) the centralized announcements module resolves fragmented communication at SNCBT; (4) the alumni tracking module provides a structured and systematic platform for graduate outcome monitoring; and (5) the overall system quality rating confirms suitability for institutional deployment.

For future enhancement, it is recommended to implement automated notification features for counseling appointments and announcements, improve mobile interface responsiveness, upgrade online counseling to support real-time video communication, expand alumni networking capabilities, and optimize system performance for high-traffic usage. From a research standpoint, future studies should evaluate additional ISO/IEC 25010 quality characteristics such as maintainability and portability, conduct longitudinal studies on long-term system impact and user satisfaction, and replicate the system in other similar institutions for comparative analysis.

Overall, the Online Guidance Services and Alumni Engagement System provide SNCBT with a sustainable, scalable, and institutionally aligned digital solution that supports student welfare and alumni engagement from enrollment through employment.

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