

Development of an API-Integrated Mobile Application for Automated Academic Standing and Scholarship Eligibility System

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ABSTRACT

The manual evaluation of grades and scholarship eligibility of Systems Plus College Foundation (SPCF) students lead to operational delays, human error, and untimely communication. Therefore, a better technological solution needs to be developed. The objective of this research is to propose an Automated Academic Standing and Scholarship Eligibility System through the development of an API-Integrated Mobile Application. The proposed mobile application will connect with the SPCF student portal using authorized, read-only API to get the student academic records such as student numbers, subject codes, units, and grades from the existing database without changing it. Using a rule-based evaluation engine configured by school administrators, the application will automatically calculate General Weighted Averages (GWAs), determine academic standing, deficiencies, honors, and scholarship eligibility. Using descriptive-developmental research design with quantitative approach and applying Agile-Scrum methodology, the system will be developed and tested with regards to accuracy, integration, function, and performance criteria. The proposed application will finally be tested according to the ISO/IEC 25010 software quality model considering functional suitability, performance efficiency, and usability criteria. It is expected that the proposed system will enable SPCF students to keep track of their academic standing in a systematic manner, and reduce manual efforts of administrators significantly.

Keywords: *Academic Standing, Scholarship Eligibility, API Integration, Mobile Application, Automated Evaluation, General Weighted Average, Student Academic Records*

SECTION I — INTRODUCTION (THE PROBLEM AND ITS SETTING)

1.1 Introduction

Manual checking of grades and scholarships at SPCF leads to significant delays and errors in evaluation (Orgianus et al., 2024). Manual processing of documents and grades results in enormous piles of files since the school staff has to deal with a large amount of documentation. Moreover, traditional communication techniques are extremely inefficient and result in students being informed too late about the lowering of grades and losing of their scholarship (Al-Ayyubi & Maulana, 2023). Because these conventional workflows consume excessive time and are prone to human error, implementing an efficient technological solution, specifically a mobile platform integrated with institutional API is necessary to streamline the evaluation process, eliminate manual delays, and automate academic tracking.

The primary goal of this study is to design, develop, and evaluate a mobile application for monitoring academic standing and assisting in scholarship eligibility to eliminate manual processing and replace it with a new automated and efficient system. Certain features will be integrated into the application in order to provide faster processing and workload reduction such as automated calculation of GWA, academic honors, current performance and guidance on academic deficiencies, and configurable institution-based rule setup for administrators. Furthermore, the project will benefit students by improving their academic performance, compliance, and awareness, while allowing administrators to lessen their workload and save time.

Methodologically, this project follows a software development approach intended for the development, API integration, and evaluation of a mobile application. The system implementation of the mobile application will use authorized academic records such as grades, subject codes, and student numbers, retrieved through the API to automate General Weighted Average (GWA) calculation, honors determination, academic standing, and scholarship eligibility assessment. The system will then undergo accuracy, integration, functional, and performance testing evaluated using the ISO 25010 software quality model to assess system functionality, performance efficiency, compatibility, usability, security, reliability, and maintainability in automating and streamlining academic tracking and scholarship eligibility evaluation at SPCF.

1.2 Background of the Study

The use of mobile technology in academic record systems together with API integration in educational institutions is an indication of shifting towards automation in the management of academic records. This trend is supported by the growth in the use of both mobile and internet technologies in the Philippines: as of January 2025, the country has 97.5 million internet users, who comprise 83.8 percent of the country's population, of whom most are connected via mobile networks as the primary access point (Kepios, 2025). This ubiquity of mobile phones serves as a viable enabler of automating academic processes like in the case of SPCF. Ali and Dauwed (2022) provided an example in the form of a hybrid mobile app designed specifically for student management, featuring the ways in which mobile technologies can be applied to optimize the management of student records and reduce the labor of academic staff in the process. Following the trends identified by Acuña and Bansal (2024), it is possible to see the emergence of automated systems designed for the assessment of students as a way to standardize and increase the accuracy of student performance evaluation, removing inconsistencies of the manual processes of today. At the same time, Amer (2025) demonstrated how scholarship management is being automated, supporting the idea of the use of software for the assessment, scoring, and eligibility determination of students for need-based aid. Most pertinent to the switch towards the integration through Application Programming Interface (API), as an mediator to enable the communication and exchange of data between different software applications, in which it defines the rules, protocols, and tools that enable systems to communicate and exchange information (Osame et al., 2024) a mechanism increasingly used to retrieve and synchronize academic transcript and result data directly from a school's existing student portal or information system, thus eliminating the need for manual input or scanning of documents. Altogether, it is suggested that mobile technology and system integration through API are converging to automate academic record-keeping, a trend particularly relevant in the Philippine context given the ubiquity of mobile access.

Evaluation of scholarship eligibility and monitoring of academic standing may face challenges due to manual and time-consuming processes. Checking of student grades and scholarship evaluation, especially with a large number of academic records by manual process can cause operational delays, human errors, and slower decision making (Orgianus et al., 2024). In addition, traditional methods of communicating academic standing can cause students to receive their important updates late, making it difficult for them to take action when they need to fulfill the required academic standards or scholarship qualifications when they fail (Al-Ayuubi & Maulana, 2023). The manual processing of academic documents can also require substantial time and effort and may lead to errors, disorganized records, and backlogs during periods of high demand (Casas-Humanya et al., 2025). These issues highlight the need for a more efficient and accessible system that can help students monitor their academic standing and scholarship eligibility while reducing the time and effort required for manual evaluation and document processing (Sinco & Ammaqui, 2026).

Recent studies have demonstrated how automated and data-driven systems can support academic monitoring and student decision-making. Çırak et al. (2024) developed an early warning system that uses students' academic performance data to predict academic outcomes in higher education, demonstrating how academic records can be processed to support student monitoring and early intervention. De Vreugd et al. (2024) also examined the use of learning analytics dashboards that provide students with information about their learning and study behavior, showing how academic data can be presented to help students understand and monitor their progress. In addition, Nguyen-Hoang et al. (2024) proposed a scholarship management platform that integrates technology to improve scholarship administration while addressing privacy and transparency concerns. This demonstrates how digital systems can support more organized scholarship management and secure handling of student-related information. A systematic review by Schwendimann et al. (2023) further found that student-facing learning analytics dashboards have increasingly incorporated different data sources and functions to support students' learning processes. These studies demonstrate the potential of automated academic monitoring, student-facing academic information systems, and scholarship management platforms; however, they address these functions through different systems and purposes rather than combining them into one integrated mobile application. Furthermore, because the proposed system will process students' academic records, privacy, informed consent, transparency, and responsible use of student data must be considered when developing and implementing the system. Building on these developments, the proposed Automated Academic Standing and Scholarship Eligibility

System Using API Integration for SPCF Students aims to integrate these functions into one mobile system. Through an authorized API connection, the system will retrieve the student's academic records from the student portal, process the records to calculate the GWA and assess academic standing, and compare the results with administrator-configured scholarship criteria. This integrated approach is intended to provide SPCF students with a more organized and accessible way of checking their academic standing and scholarship eligibility while reducing the need for separate manual checking and computation.

1.3 Objectives of the Study

The main purpose of this study is to design and develop an API-Integrated Mobile Application for Automated Academic Standing and Scholarship Eligibility System that would streamline and centralize the academic evaluation process of every student in Systems Plus College Foundation. This study also seeks to specifically achieve the following:

- Develop a configurable institution-based rule for school administrators to set up the eligibility criteria for academic rewards like distinctions and scholarships, without needing to manually check and change the underlying program code.
- Integrate the system with the SPCF portal with API to securely retrieve relevant student academic information required for identifying eligibility, reducing the need for manual encoding or transferring of academic records.
- Automate the evaluation and filtering of student academic records based on the configured criteria to recognize students who are qualified for specific academic scholarship, academic distinctions, and other special awards.
- Develop an efficient student eligibility inquiry feature that allows students to just enter their student number and view the available academic scholarship, academic distinction, and other academic rewards which they meet based on their data from the portal.
- Implement a feature for authorized school administrators such as the Office of Students Affairs or the Registrar's office with a centralized monitoring and management interface for viewing, filtering, verifying, and maintaining records of students as eligible for scholarships, academic distinctions, and special awards.

1.4 Scope and Limitation of the Study

It is important to note that this study also has several limitations. This application will only focus on the academic standing of the college students in Systems Plus College Foundation (SPCF) whose academic records are accessible through the authorized school portal and API web service. Also, it will be noted that this application will only get specific academic information accessible through the school portal, such as the student number, subject code, and grade, and will not modify or alter the original records on the school system. The accuracy of results, including the academic standings and scholarship eligibility, will depend on the data retrieved by the school portal and the scholarship and honors eligibility rules configured by the administrator. The system will only focus on the evaluation of the scholarship and honors eligibility based on the schools' criteria and will not approve any scholarships or honors. Additionally, the study will be limited to the selected ISO 25010 software quality criteria, specifically, the functional suitability, performance efficiency, and usability. Lastly, the system might be affected by the availability and stability of the school portal and API connection.

The study will primarily focus on automating the monitoring and evaluation of the academic standings for SPCF college students and assess their eligibility for scholarships. The limitations identified in this study define the boundaries of the system and may provide opportunities for future studies to expand its functionality, evaluate additional ISO 25010 quality characteristics, or adapt the system for use in other institutions.

1.5 Significance of the Study

Manual processing of students' academic records with regards to evaluating and verifying academic standing and scholarship eligibility can be time-consuming and workload-inducing (Orgianus et al., 2024). With this problem at hand, the researchers seek to build a mobile-based application for efficient academic standing monitoring and scholarship eligibility evaluation, providing help to the following target stakeholders:

Students. With the help of this project, students will be able to improve their academic motivation and performance by seeing their current standing, their unmet requirements, and guidance on specific areas they could improve. They will also be able to quickly process their scholarship requirements, including determining their eligibility for scholarships and qualifications for academic honors. Furthermore, the system gradually eliminates the extra effort and time that students have to exert in the traditional processes.

School Administrators. The study will be of significance to school administrators, specifically in the Registrar and Office of Student Affairs, as it will assist them in reducing their workloads by eliminating repetitive tasks of verifying students' information manually.

Future Researchers. This study will serve as a guide and a valuable source of literature for future researchers with similar concepts. This study will also further open opportunities for future researchers to innovate or redevelop the design of the product that is more accurate and with added features to address users' needs and the growing demand in technology.

1.6 Definition of Terms

In this part of the paper, there are precise definitions of important terminologies used in the study to facilitate the understanding of unique concepts in the project on automated academic standing and scholarship assessment program at Systems Plus College Foundation (SPCF). The terminologies have been defined in light of the development of a mobile application system connected via API to assess the academic standing and scholarship eligibility of college students at SPCF.

- **Academic Performance** – Defined within this study as the measurement of a student's scholastic achievement and subject grades retrieved through the SPCF portal to assess educational progress.
- **Academic Standing** – Defined as the official classification of a student's status determined by processing their computed grades against institutional retention policies.
- **Administrators** – Defined as authorized personnel from the Registrar's Office or Office of Student Affairs who use the system interface to configure rules, monitor student metrics, and manage scholarship criteria.
- **Application Programming Interface (API)** – Defined as the secure communication bridge utilized by the mobile application to automatically request and pull student grades and credentials directly from the existing SPCF portal database without manual file uploads.
- **Automated System** – Defined as the developed mobile software that executes calculations, rank filtering, and eligibility checking instantly without requiring human intervention or manual tallying.
- **General Weighted Average (GWA)** – Defined as the mathematically computed average of a student's grades across all enrolled subjects, weighted according to their respective unit values within the mobile application.
- **ISO/IEC 25010** – Defined as the international standard utilized by the researchers to evaluate the quality of the developed mobile application based on functional suitability, performance efficiency, and usability testing.
- **Mobile Application** – Defined as the software platform deployed on mobile devices that provides students with a user interface to view their academic standings and allows administrators to oversee scholarship evaluations.
- **Rule-Based Evaluation** – Defined as the automated logic programmed into the system where pre-defined institutional requirements and grade thresholds are automatically applied to filter and evaluate student qualifications.
- **Scholarship Criteria** – Defined as the specific grade cutoffs, unit loads, and academic requirements set by school policies that are digitally encoded into the system parameters for evaluation.

- **Scholarship Eligibility** – Defined as the system's output status indicating whether a student successfully meets all the automated institutional requirements to qualify for a specific scholarship or academic distinction.
- **Student Academic Records** – Defined as the official digital data points (including student numbers, subject codes, units, and grades) securely accessed from the SPCF portal.
- **Student Portal** – Defined as the existing online institutional web service of Systems Plus College Foundation that serves as the primary data source retrieved via API by the mobile application.

SECTION II — LITERATURE REVIEW

2.1 Introduction to the Review

This chapter provides a detailed literature review of related studies which serve as the background and theoretical foundation of developing an automated mobile application for academic standing and scholarship eligibility monitoring. For the purpose of gaining a deeper understanding of the current research setting, the literature is divided into several thematic blocks which include academic performance and academic standing; general weighted average and automated grade computation; scholarship eligibility and rule-based evaluation; student information systems and academic record management; API integration and interoperability in educational systems; software quality standards and other institutional applications.

The review focuses on the effect of technological innovations and data analytics on academic performance and progression at a higher education institution, with examples drawn from the international literature and the specific local context of the Philippines. Then, the review addresses the aspects of computerized grade management and automation of general weighted averages to simplify the process of handling data by the institutions. After that, the use of rule-based evaluation and student information management systems for organizing academic records and assessing scholarship eligibility criteria is considered. Moreover, the technical side of Application Programming Interface (API) integration and interoperability standards for connecting external applications to institutional databases in order to obtain data without altering the original records is explained. Finally, international models of software quality standards, namely ISO/IEC 25010 and existing institutional applications are reviewed in order to find research gaps and determine the importance and relevance of the proposed system for SPCF.

2.2 Review of Related Literature and Studies

2.2.1 Academic Performance, Academic Standing and Digital Systems

Academic performance with the help of digital technologies and data-driven approaches is progressively investigated in higher education. Valverde-Berrocso et al. (2022) examined the relationship between educational technology and academic performance through a systematic review of 100 studies. In their review, they found that many of the reviewed studies reported the beneficial impacts of technology-supported educational practices on academic performance, though the effects varied depending on how the technology was being implemented and the educational context. Similarly, in a recent study of Xue et al. (2024) by examining 162 studies on technology adoption in higher education, mobile learning tools were one of the most frequently studied technologies and that perceived usefulness or performance expectancy was an important factor influencing technology adoption among higher-education users. Weerarathna et al. (2025) also further investigated academic success in the digital era, wherein factors such as technology integration, motivation, engagement, self-regulated learning, and other technology-related factors are deemed relevant to academic success in higher education. Technology providing opportunities for academic support was also emphasized, however, there are also challenges with implementation and technology use.

In national and local studies, academic performance is an important indicator of student progress. Miranda et al. (2022) studied 165 college students and found a significant relationship between study skills and academic performance during the new normal, indicating the need to monitor academic outcomes to assess

educational progress. Likewise, Galit-Lluz (2021) studied the academic performance of teacher education students at the University of Eastern Philippines, focusing on its relationship with students' values and demographic characteristics. Their research highlights the significance of academic performance as a key metric for assessing student outcomes in Philippine higher education. Specifically in Central Luzon and Angeles City, the importance of monitoring academic performance was also emphasized. Tomas (2024) recommended an academic tracking program to support student success as a result of examined GPA, failed and incomplete subjects, dropped subjects, and absences among students at Nueva Ecija University of Science and Technology. In Angeles City, Santillan (2023) used GWA as an indicator of academic performance. Additionally, these studies demonstrate how academic records can be systematically analyzed to determine student outcomes.

Digital systems are now increasingly used to handle and analyze academic records in higher education. Stojanov and Daniel (2024) reviewed 75 studies focused on big data and analytics in higher education. As indicated in their findings, higher education institutions deal with generating and using a large scale of student-related data, with analytics applied to assist learning, teaching, and administrative decision-making. This shows that data-driven approaches are emerging relevant tools in understanding student performance and helping institutional processes. In the Philippine setting, existing studies have also demonstrated the development of computerized systems for managing student grades efficiently. Banag (2024) developed a Grade Management Information System intended to improve the management and processing of student grades. The system was also evaluated using software-quality characteristics, demonstrating the feasibility of computerized grade management in the Philippine educational setting. Similarly, the Student Grade System created by Barcenas et al. (2024) for Bestlink College of the Philippines, enhances transparency and reduces workload coming from grade management as well.

2.2.2 Scholarship Eligibility and Rule-Based Evaluation

Scholarship eligibility is commonly determined using specific requirements and academic criteria that help institutions identify students who qualify for financial assistance. Nanath et al. (2022) discussed the use of decision-support approaches in higher education, showing how multiple criteria and student-related information can be considered to support institutional decision-making. This demonstrates how computerized systems can assist in evaluating information based on established conditions instead of relying entirely on manual checking. In the Philippine setting, Secugal et al. (2021) developed a scholarship management system that supported the processing and monitoring of scholarship-related transactions. Their study demonstrated how a computerized system can organize scholarship information and assist institutions in managing scholarship processes more efficiently. Likewise, Gabayan and Alvaro (2021) developed a scholarship information management system that included academic performance prediction and decision-support features, demonstrating the use of student academic information in supporting scholarship-related evaluation. These studies show that computerized systems can organize student information and evaluate scholarship eligibility based on established criteria. For the proposed system, the mobile application will retrieve authorized academic information from the SPCF Portal through the proposed API integration, if access is authorized and available. The information will be used to calculate GWA and evaluate academic requirements based on configured scholarship criteria, while the final scholarship decision will remain with authorized school personnel.

2.2.3 Student Information Systems and Academic Record Management

Student Information Systems are designed to organize, store, retrieve, and manage student-related information within educational institutions. Çelik and Ayaz (2022) examined the success of student information systems and emphasized the importance of system quality, information quality, and service quality in the use of such systems. Their study demonstrates how the quality of an information system can affect the usefulness and effectiveness of managing student information. In the Philippine setting, Grepon et al. (2021) developed an e-school system for a community college in Northern Mindanao that supported the management, storage, processing, and retrieval of school-related information. Similarly, Riño and Daing (2022) examined student record handling in a public secondary school in Bulacan and highlighted the importance of organized student information management in educational institutions. These studies demonstrate how information systems can make student records more organized and accessible. The proposed mobile application will retrieve authorized academic information from the SPCF Portal through API integration, if access is provided. The retrieved records will be processed to calculate GWA, determine academic standing, identify deficiencies, and evaluate scholarship eligibility without modifying the original portal records.

2.2.4 API Integration and Interoperability in Educational Systems

The Ed-Fi Alliance (2023) explained how APIs can be used to connect a Student Information System (SIS) with other applications. In this setup, the SIS provides the information, while another application receives the data through RESTful APIs. Through HTTPS requests, the systems can exchange organized information, allowing different educational systems to work together. OECD (2023) also explained that when educational systems cannot easily share information, staff may need to enter the same data repeatedly, which can add more work to their daily tasks. These studies highlight the need for better connections between educational information systems. For the proposed system, API integration can provide a way for an authorized application to get academic information from an existing school system, which can help lessen repeated manual data entry.

2.2.5 Mobile Applications for Academic Monitoring

Monzon et al. (2025) developed the WIRED IN application, a campus-based mobile application for students in higher education that uses API architecture. The application was made to provide students, faculty, and staff with health declaration and announcement services. The study showed that APIs can also be used to connect the application with other systems, such as health databases, so information can be shared when needed. The application was evaluated based on accessibility, reliability, timeliness, and security. This study shows that API-based systems can also be used in Philippine higher-education institutions to connect different systems and provide useful services to students.

Castle (2024) discussed an educational application that used a web API and interoperability standards to connect different educational technologies. The study showed how APIs can help different parts of an educational system communicate and share information. This is related to the proposed application because using an API could allow the system to get authorized academic information from an existing school system. However, this would only be possible if the school system provides an API and allows access to the needed data. The integration would also need to follow the school's technical and security requirements.

Naveed et al. (2023) reviewed 161 studies about the use of mobile technologies for learning in higher education. The study found out that mobile devices can help students learn even when they are not inside the classroom. Students can use their phones or other devices to access learning materials, communicate, and stay connected with their school activities. The study shows that mobile technology can be useful in colleges and universities and can help provide students with easier access to academic information and school services.

Rangel-de Lazaro and Duarte (2023) reviewed different studies about mobile learning applications used in online higher education. They found that mobile learning is not just for extra learning materials because it can also help students learn and get information more easily. The applications in the studies helped students and teachers communicate, interact, and work together. The study also showed that mobile applications can be useful for different school activities. This relates to our proposed system because our mobile application will allow SPCF students to check their academic information, monitor their academic standing, and see if they may qualify for scholarships or academic recognition. This can make it easier for students to keep track of their academic status in one application.

Acuña, Sabili, and Frigal (2024) developed MARA, a mobile-based academic reminder application for students of Emilio Aguinaldo College–Manila. The application was made for Android phones and helped students keep track of their class schedules and assignment deadlines. The study shows that mobile applications can be useful for helping college students manage their school responsibilities. This is related to our proposed system because our application will also use a mobile platform to help SPCF students keep track of their academic standing and scholarship eligibility. Instead of checking this information manually, students can use the application to view their academic status and know if they may qualify for scholarships or academic recognition.

2.2.6 Automated Academic Monitoring and Decision Support Systems

Automated and data-driven methods have become progressively used to identify problems in academic performance and make students-related decisions in the field of higher education. Çırak et al. (2024) designed an early warning academic performance system for higher education institutions, in which they used classification models such as naive Bayes, decision tree, and random forest to predict outcomes of first-year students, where the latter algorithm has managed to reach 90.2% accuracy in terms of recognizing students that are at risk in passing or failing. In another study, Christou et al. (2023) has designed a decision support framework wherein it harnesses textual and academic data to identify students at risk of dropping out of higher education in an early

stage, which helps in making appropriate academic interventions before their situation worsens. Thus, it is evident that in this present time, education systems have widely utilized automated systems to not only detect academic performance issues but also to make relevant decisions to support both students and institutions.

The same systems are used in the Philippines to monitor and record students' academic performance. With the goal to train predictive models of the academic achievement of students, Šýbenský et al. (2024) analyzed multiple learning management system logs in a large Philippine university. This study has shown how universities in the Philippines utilized a form of data science to estimate the academic achievement of students. A web portal for data-driven assessment and course recommendation for senior high school students was designed by Gajardo and Balahadia (2025) in another study carried out in the Philippines with regard to the poor outcomes of Filipino students in a number of national assessments, including the NAT. The aforementioned systems demonstrate how Philippine universities have started to utilize software and automated systems to manage academic records along with offering user-friendly interfaces for the students and faculty in evaluating their academic performance.

In the Philippines, a similar academic monitoring system has also been created. In order to digitize Colegio de Santa Rita de San Carlos Inc.'s conventional grading system, Bato and Pomperada (2025) developed the Student Performance Analytics and Grading Automation System. The online platform reduces the workload associated with grade processing while automating grading and giving users real-time performance metrics to help the institution make decisions based on data.

Therefore, these results suggested that the SPCF system expands upon the worldwide trend of automated, decision-support-driven academic monitoring all while tailoring it to the specific requirements of institutions in a higher education. The proposed approach integrates real-time academic standing determination, automated GWA computation, deficiency assessment, and eligibility for scholarships evaluation into a single mobile application that is retrieved directly from SPCF's student portal via an approved API connection, as opposed to the early warning and prediction-based systems reviewed within the national and international context, which mainly estimate student performance.

2.2.7 Data Security and Privacy in Student Information System

In order to employ digital technology in higher education, it is important to ensure security of student records in the process of storing, retrieving, and transferring the information. Exchange of student records makes possible various applications of academic services, but it should be always safe and secure, as stated by Alamer et al. (2025). They have come up with a consent-based access control scheme that hinges on encryption of information before it becomes public and access to which is made possible only with consent of students. In reply, Balachandar and Venkatesh (2025) have raised issues regarding the contradiction between these two aspects. To ensure the safety of every students' data and enable its analytical use, they used a combination of encryption, differential privacy, and role-based access control.

The Data Privacy Act of 2012 (Republic Act 10173) is the law tackling this subject in the Philippines. Thus, Dela Rosa (2025) examined the attitudes of information technology students in a national university on data privacy. From what was written in the article, creating a culture of data privacy in higher education institutions must include enhancing the privacy literacy of the students and the curriculum of the universities.

The same concern is true for the problem of balancing pro-analytical and security factors when implementing the Act in a college of University of Cagayan Valley (Remigio, 2024). Although the article mentioned that the desired institution did good in many respects of privacy of data, there were still improvements needed to be done in certain areas, which include health record management and exchange of information with outside parties. This implies that any institution that stores and shares student data must create concrete measures to control access to this information, particularly at the point of third-party interactions.

The proposed system is highly applicable to the issue of information security during the retrieval of student data. Unauthorized entry is a critical issue required to be resolved in the case of the SPCF app, which will be using an authorized API connection to retrieve student data from the student portal. Only people with proper authorization should be allowed to make requests for students' records, and the information that is pertinent to the requesting student alone should be released. Moreover, people who have proper authorization should go through documents with well-defined permissions. Hence, the authorization process should depend on the consent of the student and role-based access control mechanisms.

2.2.8 Software Quality and ISO/IEC 25010

Evaluation of software quality models in the higher education context allows to check if the produced software is consistent with the international standards related to its reliability, usability, and suitability. Rojas et al. (2025) provided a bibliometric and thematic analysis of the development of the ISO/IEC 25010 standard, highlighting its significance for contemporary software engineering and approaches to system evaluation. For example, for the development of institutional information systems in the Philippines, Lagman et al. (2024) have developed an enterprise-wide digital governance information system for the SUCs. They evaluated the efficiency and compliance with the system's structure of the developed tool using the ISO/IEC 25010 software quality model. The findings revealed the possibility of measuring the efficiency and the user satisfaction by means of standardized quality measurements in the context of higher education in the Philippines. Furthermore, the use of the standard worldwide, such as the framework by Keibach and Shayesteh (2022), indicates that the application of the ISO/IEC 25010 model provides a systematic approach to the evaluation of software tools in terms of their quality characteristics.

2.2.9 Related Systems and Applications

From the literature review and recent system development, it is clear that there is an increasing trend of adopting computerized systems for academics, governance, and tracking of higher education institutions. Locally, Tiopes and Tiopes (2026) have implemented a web-based enrollment and academic record management system, which was customized for Paranaque City College, showing how digital platforms can be used in managing student profiles, class lists, and enrollments. To support the administrative and institutional aid processes, Mendez et al. (2025) have created a scholarship management system with CMS for the Lyceum of the Philippines Cavite, emphasizing on web-based administrative functions and announcements for tertiary students. Supporting this, recently implemented institutional systems such as the SMART-Scholar: A Scholarship Management and Tracking System (2025) highlight the need for tracking the status of students and the automation of the scholarship applications processing process. However, it should be noted that these existing systems effectively resolve institutional processes, such as general enrollment, CMS integration, or scholarship management and tracking, but as separate modules. Moreover, despite the automation of administrative and tracking processes, these related systems use either standalone databases or manual input instead of API synchronization of the information with the institutional student portal securely. The literature thus reveals that an integrated mobile platform combining real-time academic performance monitoring, automated GWA tracking, and automated rule-based scholarship evaluation via secure API integration remains insufficiently addressed, establishing the necessity for the proposed SPCF system.

2.3 Conceptual Framework

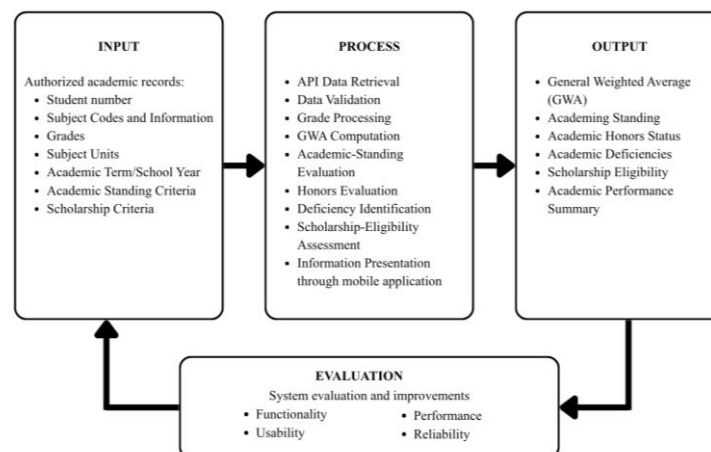


Figure 1. *Conceptual Framework of the Study*

In this case, the Input is the authorized academic records from Systems Plus College Foundation's portal, which consists of student identification number, subject codes and information, grades, subject units, academic terms, academic standing criteria, and scholarship criteria.

The Process involves the implementation of an API-integrated mobile application for automated academic standing and scholarship eligibility. This includes the API data retrieval from the portal, data validation, grade processing, GWA calculation, academic-standing evaluation, honors evaluation, deficiency identification, scholarship-eligibility assessment, and information presentation through the mobile application.

The Output shows the intended results as a result of the automated set-up, which consists of the computed GWA, academizing standing, academic honors status, academic deficiencies, scholarship eligibility, and academic performance summary.

The Evaluation part is where the results will be assessed with the defined requirements such as functionality, usability, performance, and reliability. The outcome of the evaluation will take effect on the system for improvement and ensure that it functions properly as intended.

2.4 Synthesis

The literature and studies reviewed show that digital technologies and computerized systems are becoming more useful in higher education. They can help schools monitor students' academic performance, manage academic records, and make decisions based on student information. Studies about academic performance and GWA show that academic records can be used to track students' progress and evaluate their academic results (Valverde-Berrocoso et al., 2022; Stojanov & Daniel, 2024). Studies about scholarships also show that computerized systems can organize student information and help check if students meet the requirements for scholarships (Secugal et al., 2021; Gabayan & Alvaro, 2021). Student Information Systems also show how student records can be stored, managed, and accessed in an organized way (Çelik & Ayaz, 2022; Grepon et al., 2021).

The reviewed studies and literature also show the importance of API integration and interoperability in allowing different educational systems to share information. The Ed-Fi Alliance (2023) and OECD (2023) explained that connecting different systems can make data sharing easier and reduce the need to enter the same information more than once. Monzon et al. (2025) also showed how API architecture can be used in a mobile application in a Philippine higher-education setting. In addition, mobile applications can give students easier access to academic information and other school services (Naveed et al., 2023; Rangel-de Lazaro & Duarte, 2023). Other studies also show that automated systems can process academic information and use set rules or criteria to determine student performance and provide results (Çırak et al., 2024; Christou et al., 2023).

However, most of the reviewed systems focus only on certain functions, such as managing grades, student records, student monitoring, or scholarships (Banag, 2024; Grepon et al., 2021; Mendez et al., 2025). Based on the studies reviewed, there is still a need for a system that combines these functions in one mobile application. In particular, there is limited research on a system that can get authorized academic records through an API and use them for GWA computation, academic standing, deficiency checking, and scholarship eligibility. Because of this, the proposed SPCF system aims to combine these functions in one mobile platform. With an authorized API connection to the SPCF Portal, the system will get the allowed academic information and use it to calculate the student's GWA, determine academic standing, identify deficiencies, and check scholarship eligibility based on the school's set requirements. The original academic records will remain unchanged.

SECTION III — METHODOLOGY

3.1 Research Design

This study adopts a Descriptive-Developmental Research Design with a Quantitative approach. The developmental part focuses on the design, development, integration, and testing of the API-integrated mobile application for automated academic standing and scholarship eligibility monitoring. The descriptive and

quantitative aspect evaluates the development of the system in terms of its functionality, usability, efficiency, and user satisfaction through quantitative data gathered from the selected respondents.

The developmental approach will guide the researchers in creating the mobile application based on the needs of the students and the purpose of the study. The development process will include planning the system, designing the user interface, creating the database, integrating the API, coding the application, testing and debugging its features and codes, and making improvements when needed.

The mobile application will be designed to help monitor the academic standing of students and identify students who may be eligible for scholarship based on the set requirements. It will also allow the academic recognition, such as Dean's List or other academic distinctions included in the system. The API integration will allow the application to communicate with other required services or data sources to support the system's functions.

After the development of the application, the researchers will conduct system testing to check if its features work properly. Selected respondents will then use the application for testing then evaluate it through a structured questionnaire. The questionnaire will measure areas such as functionality, usability, efficiency, reliability, and user satisfaction.

The data collected from the respondents will be analyzed using descriptive statistical methods such as frequency, percentage, and mean. The results will help the researchers to determine how well the application performs and identify the areas that may need improvements.

Overall, this research design is appropriate because the study involves both the development of a mobile application and the evaluation of the finished system. Through this approach, the researchers can develop an API-integrated application that can help students and authorized users monitor academic standing, identify scholarship eligibility, and record or filter academic recognition awards efficiently.

3.2 System Development Methodology

Agile Development Methodology

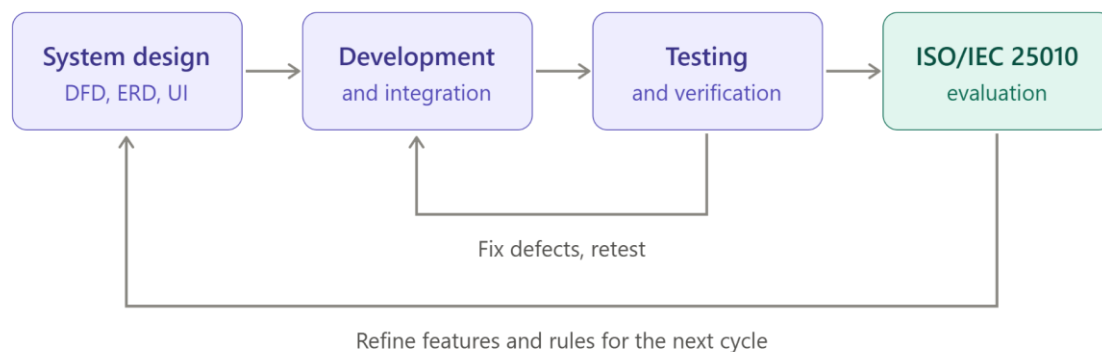


Figure 2. Agile Methodology

The Agile software development method will be used in this study, wherein a system is done through brief, repetitive cycles, each of which undergoes testing and improvement before another cycle starts. Agile method has been utilized in developing mobile applications as shown by empirical research conducted in a practical setting (Alrabaiah & Medina-Medina, 2021). This methodology is suitable for this study since the system is dependent on an external API and also relies on scholarship and honor codes that can be configured by the administrators. Lagman et al. (2024) combined the usage of Agile methodology along with the ISO/IEC 25010 model in the development of an information system in state universities of the Philippines.

Agile Phases

System design

During this stage, the researchers will determine what is needed from the system and how the system should be organized. In addition, they will conduct consultations with the Registrar and OSA to establish how GWA, grade level, honors, deficiencies, and eligibility for scholarship are currently calculated at SPCF. In addition, they will

establish the type of information the school is capable of releasing using the portal API. Requirements that are determined will be documented as functional and non-functional requirements in Section 3.3. On their basis, the researchers will develop the Data Flow Diagrams (Level 0 and Level 1) describing the data flow between the student, administrator, the SPCF portal API, and the system. The researchers will also create the Entity-Relationship Diagram for the database design, flowcharts for key processes, and layouts of mobile interfaces for both the student side and administrator side. The design makes all scholarship and honors requirements configurable data instead of program code according to Objective 1.

Development and Integration

The researchers will create the mobile application and its database and connect it to the SPCF portal via an approved read-only API. Retrieved records will be authenticated and utilized to calculate the GWA, assess standing and honors, determine deficiencies, and verify scholarship eligibility based on the standards set by the administrators. There is a role-based access, so only individual records are visible to the students.

Testing and Verification

The test will be conducted in each iteration and also for the whole system. The test will include four types of tests:

1. Accuracy testing entails comparing the results obtained from the system in terms of GWA, academic standing, and eligibility with those of manual computations.
2. Integration testing will entail ensuring that the API will retrieve the right records while handling the invalid, missing, or unavailability of data.
3. Functional testing involves the testing of all the requirements in Section 3.3, which include login, dashboard, criteria, search and filter, and notifications.
4. Performance testing will involve checking the time taken to load the record and evaluation process.

ISO/IEC 25010 Quality Evaluation

After passing the testing process, users are going to evaluate it using questionnaires built according to the ISO/IEC 25010 quality model for the evaluation of [function suitability, performance efficiency, and usability]. The results which require improvements are used in the following cycle.

Participant Sampling

The study will use purposive sampling to select participants who are relevant to the intended use and evaluation of the proposed system. The participants will consist of SPCF college students who will serve as end-users and selected domain experts or authorized personnel who are familiar with academic records, scholarship requirements, and related institutional processes.

The student participants will evaluate the student-side functions, including academic record viewing, GWA results, academic standing, academic history, deficiencies, and scholarship eligibility information. The domain experts or administrators will evaluate administrative functions, including the criteria configuration, academic monitoring, search and filtering, and eligibility management.

The proposed participants will include:

- End- user: College students at Systems Plus College Foundation.
- Domain Experts/ Administrators: Authorized personnel from offices such as the Registrar, Office of the Students Affairs (OSA), and Information Technology Service (ITS), depending on availability and authorization.

Participants will be selected based on their relevance to the systems and their ability to perform the assigned evaluation tasks.

Data Collection Methods

For this study, data will be gathered from three sources namely the data obtained from the academic records from the retrieval process using the API, the output of the system testing, and the answers of the respondents to the evaluation questionnaires.

- API Data Retrieval: Student numbers, subject codes, units, grades, and academic terms will be extracted from the SPCF portal using the authorized API, with the school's written permission. Such academic records

are the inputs for GWA computation, academic standing, and scholarship eligibility evaluation. The system only retrieves the records and never modifies them. Only the fields necessary will be retrieved. [Specify whether real, anonymized or sample records will be used.] All processes follow the guidelines stated in the Data Privacy Act of 2012 (Republic Act 10173).

- **System Testing Output:** The researchers will maintain a log where each test case, along with its inputs, expected output, actual output, and whether it passes or fails will be recorded. The tests will cover accuracy (outputs of system vs. manually computed results), API integration, functionality, and performance. The log acts as proof that the computations performed and the API connectivity works as expected.
- **ISO/IEC 25010 Evaluation Questionnaire:** After using the system, respondents will fill out the questionnaires developed based on the chosen ISO/IEC 25010 characteristics. The Likert scale will be used as a 5-point scale for answering each question with 1 being Strongly Disagree while 5 is Strongly Agree. The questions will be divided into sections with each section focusing on a single characteristic of the ISO/IEC 25010 that has been selected. Respondents will be required to provide informed consent prior to answering the questionnaire. The data will be analyzed using frequency, percentage, and mean as stated in Section 3.1.

3.3 Requirement Specification and Analysis

Functional and Non-functional Requirements

This defines the functional and non-functional requirements of the API-integrated mobile application for automated academic standing and scholarship eligibility for SPCF students. The requirements identified are in accordance with the ISO/IEC 25010:2023 product quality model, which provides a framework for specifying, measuring, and evaluating the quality of software and information system products. Illustrations such as Data Flow Diagrams (Levels 0 and 1), Entity-Relationship Diagrams, and flowcharts will also be constructed to model these requirements and show the system's data flow, database structure, and operational processes.

Functional Requirements

This section presents the what following functions the system must do:

Table 1. *Functional Requirements*

Requirement	Description
User Authentication	The system shall allow secured log in using credentials from authorized students and administrators.
API Academic Data Retrieval	The system shall retrieve authorized academic records from the academic data source through API.
Academic Data Validation	The system shall validate gathered academic data to ensure they are complete, accurate, and in the expected format before they are processed.
Academic Record Management	The system shall organize and manage authorized academic records, including student information, subjects, grades, units, academic terms, and school years, allowing authorized users to access and review relevant academic information.
Automated GWA Computation	The system shall compute the student's GWA automatically using the retrieved grades and subject

	units.
Academic Standing Evaluation	The system shall evaluate the student's academic standing based on the defined academic criteria in the system.
Academic Honors Evaluation	The system shall determine when a student meets the configured qualifications for application academic honors.
Academic Deficiency Identification	The system shall identify applicable deficiencies, such as failing or incomplete grades, depending on the available academic records and rules.
Scholarship Eligibility Evaluation	The system shall assess a student's scholarship eligibility on the basis of scholarship criteria set-up by authorized administrators.
Scholarship Criteria Management	The system shall allow administrators to add, modify, or manage requirements and criteria.
Academic Criteria Management	The system shall allow authorized administrators to configure applicable academic-standing and honors requirements.
Student Academic Dashboard	The system shall display relevant academic information, including GWA, academic standing, performance status, histories, deficiencies, and scholarship eligibility.
Academic History	The system shall allow students to navigate available academic records by academic term or school year.
Administrator Dashboard	The system shall allow authorized administrators to search and filter academic records according to permitted fields such as student number, academic term, or program.
Notifications	The system may notify students of relevant academic information, such as updated records, deficiencies, or scholarship-eligibility results.
Data Synchronization/Refresh	The system shall obtain and update available academic records to reflect the latest authorized data and provide a mechanism for authorized users to retrieve or refresh updated academic information from the connected data source.
Logout and Session Management	The system shall allow users to securely end their active session.

Non-Functional Requirements

This section presents how well the system performs the following functions:

Table 2. *Non-Functional Requirements*

Requirement	Description
Functional Suitability	The system should contain all required academic-monitoring and scholarship-evaluation functions, accurately calculate based on configure rules, and support the needs of both students and administrators at SPCF.
Performance Efficiency	The system should perform its operations within reasonable time and resource limits. These include loading within an acceptable response time, no unnecessary delays, efficient API requests processing, and no excessive consumption of device resources.
Compatibility	The application should communicate and exchange academic data correctly with the authorized API and operate properly across its supported mobile devices and operating-system environments.
Interaction Capability	The application should provide a clear and user-friendly interface that enables students and administrators to easily access and understand academic information.
Reliability	The application shall produce accurate results consistently and manage invalid data, network interruptions, and temporary system failures properly.
Security	The application should protect users' information via authorized access, multi-factor authentication, role-based access control, and secure data transmission with communication protocols.
Maintainability	The application should be structured and documented to enable authorized developers to effectively modify, update, troubleshoot, and maintain the system and its configured rules.
Flexibility	The application shall be adaptable to supported mobile devices, operating environments, and future system or configuration changes with minimal disruption.

Data Flow Diagrams (DFDs)

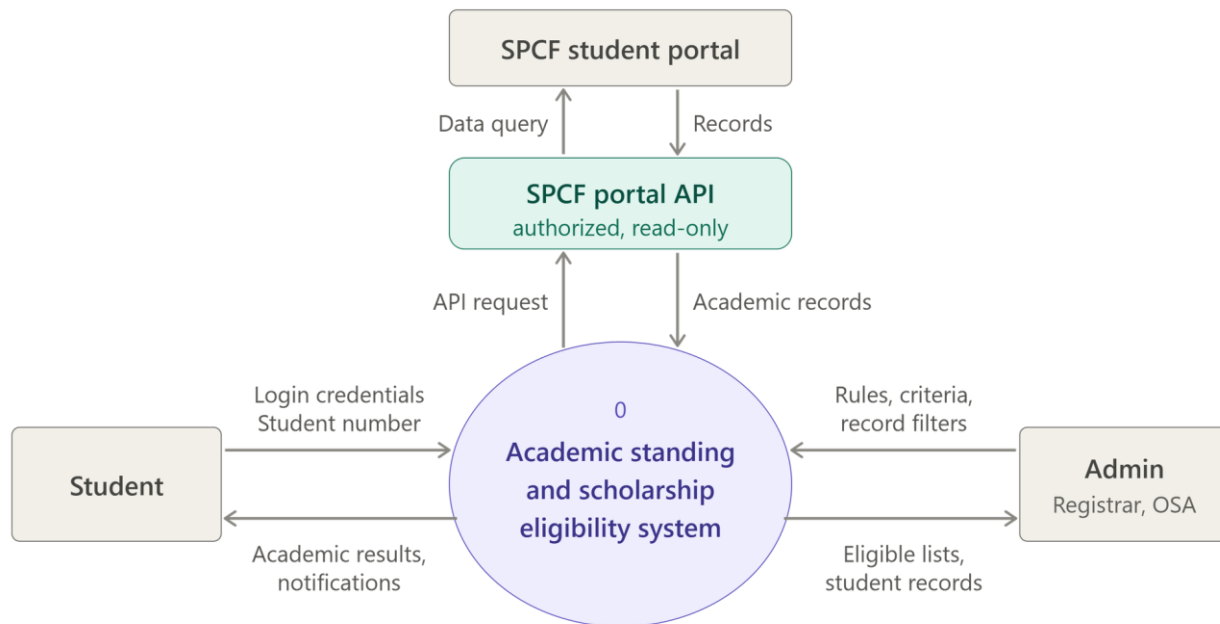


Figure 3. Data Flow Diagram Level 0 - Context Diagram

This context diagram shows how the proposed API-Integrated Automated Academic Standing and Scholarship Eligibility System exchanges information with the student, Admin, and SPCF Portal API. It shows where the information comes from, how it is processed, and what information is given back to the users.

The Student provides their login credentials and student number to access the system. After receiving these details, the system sends an API request to the SPCF Portal API to get the student's academic records. The academic records are then sent to the proposed system, where they are checked and processed. After processing, the system gives the student their academic results and notifications, including information about their academic standing and scholarship eligibility.

The SPCF Portal API connects the proposed system to the SPCF student portal. The API allows the system to get the needed academic records from the student portal. It is authorized and read-only, which means the proposed system can only view and get the records and cannot change the information stored in the SPCF student portal.

The Admin, represented by the Registrar or OSA, provides the rules, criteria, and record filters that the system will use when checking the students' records. These rules may include the requirements for academic standing, academic recognition, and scholarship eligibility. After checking the records, the system provides the Admin with eligible student lists and student records that can be used for monitoring and checking purposes.

In conclusion, the diagram shows how the proposed system receives student information and academic records, checks them based on the given requirements, and produces the needed results. The API integration helps the system get academic records from the SPCF student portal, while the automated checking helps make the process of monitoring academic standing and scholarship eligibility more organized and easier to manage.

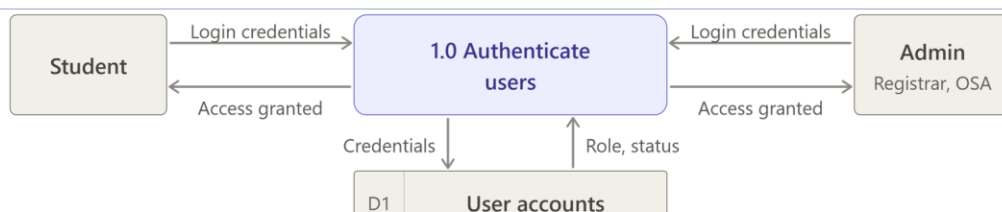


Figure 4. Data Flow Diagram Level 1 - System Overview

This diagram shows a closer look at how the proposed system works inside. It breaks down the single process from the context diagram into five smaller processes, and it also shows the data stores where information is kept.

1.0 Authenticate Users, this process checks if the Student or Admin is allowed to use the system. Both the Student and Admin give their login credentials, and the process checks these credentials against the D1 User Accounts data store. If the login is correct, the process sends back the user's role and status, and the system gives access to the Student or Admin.

2.0 Retrieve and Validate Data, this part is in charge of getting the student's academic records from the SPCF portal. It sends an API request to the SPCF Portal API, which is authorized and read-only, meaning it can only view records and not change them. The API sends a data query to the SPCF portal, and the portal sends back the

academic records. After the process validates the data, it saves the validated data in the D2 Academic Records data store.

3.0 Evaluate Standing and Eligibility, this process checks the students' academic standing and scholarship eligibility. It uses the academic records from D2 and the rules from D3 Evaluation Rules to check each student. After checking, it computes the results and saves them in the D4 Evaluation Results data store.

4.0 Manage Evaluation Rules, this fourth process lets the Admin set up the rules and criteria used for checking students. The Admin gives the rules and criteria, and this process saves them as configured rules in the D3 Evaluation Rules data store.

5.0 Present Results and Monitor Records, the last part shows the stored results to the Student and Admin. The Student gives their student number and receives dashboard data showing their academic standing and eligibility. The Admin can search and filter records, and in return receives the eligible lists of students.

Entity Relationship Diagram

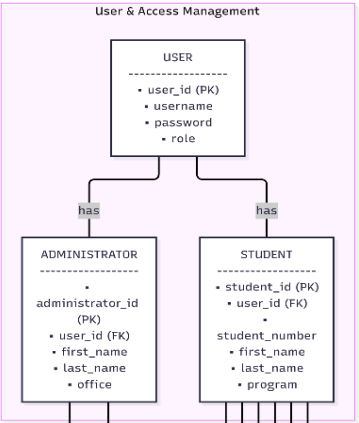


Figure 5. Entity-Relationship Diagram (ERD)

The Entity Relationship Diagram (ERD) illustrates the structure of the proposed system's database. It identifies the entities (tables), their attributes (fields), and the relationships that connect them, serving as the blueprint for how data will be organized and stored.

User serves as the base account table for anyone who logs into the system. It stores the `user_id`, `username`, `password`, and `role`, which determines whether the account belongs to a Student or an Administrator.

Student stores the personal and academic identification details of a student, including student_id, student_number, first_name, last_name, and program. It is linked to USER through user_id, meaning every student record corresponds to one user account.

Administrator stores the details of the Registrar or OSA staff who manage the system, including administrator_id, first_name, last_name, and office. Like STUDENT, it is linked to USER through user_id.

Notification records the messages sent to a student, such as updates on academic standing or eligibility. It stores the notification_type, message, is_read status, and notification_date, and is linked to the Student who receives it.

Academic term defines the academic period being referenced, storing the term_id, academic_year and semester. This table is referenced by other tables to indicate *when* a particular record, standing, or evaluation applies.

Subject stores the list of subjects offered, including the subject_id, subject_code, subject_name, and units. It is used to identify which subject a specific academic record belongs to.

Academic record stores a student's grade and unit load per subject for a specific term. It connects STUDENT, SUBJECT, and ACADEMIC_TERM, and serves as the primary source of data used to evaluate a student's academic performance.

Academics standing stores the result of evaluating a student's overall performance in a term, including their gwa and standing_status (e.g., good standing, warning, probation). This is derived from the student's academic records.

Academic honor stores any academic distinction (honor_name) a student earns for a given term, along with its status and evaluation_date.

Deficiency records any academic deficiency a student incurs, such as a failing grade, storing the deficiency_type, description, and status. It is linked to both STUDENT and ACADEMIC_RECORD, since a deficiency originates from a specific academic record.

Scholarship stores the scholarship programs offered, including the scholarship_name, description, and status.

Scholarship eligibility determines whether a student qualifies for a specific scholarship in a given term. It connects STUDENT, SCHOLARSHIP, and ACADEMIC_TERM, and stores the eligibility_status, remarks, and evaluation_date.

Academic Criteria stores the requirements set by the Administrator for determining good academic standing, such as minimum_gwa and other requirement conditions.

Scholarship criteria stores the specific requirements for each scholarship, including minimum_gwa, required_units, required_standing, and whether the scholarship allows_failing_grade. This table is managed by the Administrator and is used as the basis for evaluating scholarship eligibility.

To summarize, the user account branches into either a student or an administrator profile. A student's academic records form the basis for computing their academic standing, honors, and scholarship eligibility, while deficiencies are flagged when records fail to meet requirements. The Administrator, in turn, manages the criteria and rules that govern how these evaluations are made, ensuring that the system's checks are based on defined and consistent standards.

Flowchart

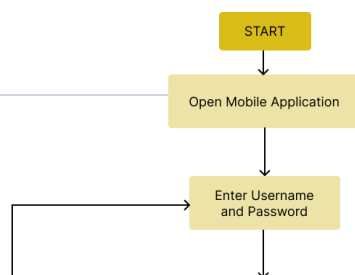


Figure 6. *System Flowchart of the Proposed System*

The flowchart shows the step-by-step process of how the proposed system works, starting from when the user opens the mobile application up to when they log out.

The process begins when the user opens the mobile application and enters their username and password. The system then checks if the login is valid. If the login is not valid, the system displays a login error and brings the user back to the login screen to try again. If the login is valid, the system checks the user's role, which can either be an Administrator or a Student, and directs them to the appropriate part of the system.

If the user is an Administrator, the system opens the Administrator Dashboard. From here, the Administrator is asked whether they want to manage the criteria used for evaluating students. If yes, the Administrator can add or update academic records and scholarship criteria, then save these changes. If no, or once the criteria have been saved, the Administrator can search and filter student records. The system then retrieves the academic records, allowing the Administrator to view each student's GWA, academic standing, honors, deficiencies, and scholarship eligibility in order to monitor their overall performance.

If the user is a Student, they are asked to enter their student number. The system then sends an API request to retrieve the student's academic records from the SPCF Portal.

Once the records are retrieved, the system checks whether the academic data is valid and complete. If the data is not valid, an error message is displayed, and the student is given the option to refresh or retry retrieving the data. If the data is valid, the system stores or updates the academic records and proceeds to calculate the student's GWA. Based on this, the system automatically evaluates the student's academic standing, checks for any academic honors, identifies possible academic deficiencies, and evaluates the student's eligibility for available scholarships. After completing these evaluations, the system generates an academic summary and displays it on the student's dashboard.

The student is then given the option to refresh their academic data. If yes, the system repeats the process of sending an API request and retrieving updated records. If not, the student may instead view their academic history and notifications.

Finally, regardless of whether the user is an Administrator or a Student, the process ends when the user logs out of the system.

3.4 System Design Specification

The system follows an API-integrated mobile application architecture. The mobile application connects to the authorized SPCF student portal API to retrieve student academic records, such as student information, subject details, grades, and other available academic data. The retrieved information is processed by the system to automatically calculate the General Weighted Average (GWA), determine academic standing, identify academic deficiencies, and evaluate eligibility for scholarships, academic distinctions, and special awards based on administrator-configured criteria. The system does not modify the original academic records stored in the SPCF student portal. The system design and data flow are based on the requirements identified for the proposed application.

Major Components

1. Student Mobile Application – Allows students to access their academic information, view their computed GWA, academic standing, academic history, deficiencies, and scholarship or recognition eligibility.
1. SPCF Portal API – Provides authorized and read-only access to available student academic records from the SPCF student portal. The API serves as the connection between the mobile application and the school's academic information.
2. Academic Data Processing Module – Processes the academic records retrieved through the API and performs GWA computation, academic standing assessment, deficiency identification, and other academic evaluations.
3. Rule-Based Evaluation Engine – Evaluates students based on administrator-configured requirements for scholarships, academic distinctions, and special awards. The criteria can be managed without changing the main application code.
4. Centralized System Database – Stores authorized system data, configured evaluation criteria, user roles, evaluation results, and other information required by the application.

5. Administrator Interface – Allows authorized administrators to view and monitor student academic information, manage evaluation criteria, search and filter records, verify retrieved data, and maintain system information.
6. Role-Based Access Control – Separates the access privileges of students and administrators. Students can view their own academic information, while authorized administrators can access monitoring, verification, and criteria-management functions.

System Flow – Student enters credentials/student number → System authenticates the user → Mobile application requests authorized academic records through the SPCF Portal API → Retrieved academic data is validated and processed → System calculates GWA and evaluates academic standing, deficiencies, scholarship eligibility, and academic recognition → Student views the results through the mobile application → Administrator can monitor, verify, and manage evaluation criteria and records.

3.5 Implementation

The mobile application will be developed to provide students with access to their academic records, General Weighted Average (GWA) computation, academic standing information, and scholarship eligibility status. The system will connect to the authorized SPCF student portal or API to retrieve available academic information, such as student number, subject codes, and grades. Retrieved academic data will be processed by the application to calculate the student's GWA and determine academic standing and scholarship eligibility based on the configured institutional criteria. Administrative access will also be implemented to allow authorized personnel to verify academic records and manage applicable scholarship requirements and criteria. The system will be developed and tested using authorized or sample academic records within a controlled environment. Actual access to SPCF student records and portal/API services will remain subject to institutional authorization and data privacy requirements.

The completed system will be deployed as a mobile application connected to the authorized SPCF student portal or API. The application will allow authorized students to log in or provide their student number and retrieve available academic information from the school portal. Retrieved records will be processed by the application to display academic performance, calculate GWA, determine academic standing, and assess scholarship eligibility based on the configured criteria. An administrative interface will be provided for authorized personnel to verify academic information and manage scholarship-related requirements. The system will be deployed in a controlled environment to ensure the security and proper handling of academic records.

Prior to the initial deployment, the system will be configured to establish the connection with the authorized SPCF student portal or API. The available academic data fields required by the application, such as student number, subject code, and grades, will be identified and mapped to the system database. User accounts and appropriate access levels will be configured for students and authorized administrators. Scholarship eligibility criteria, academic standing requirements, and other applicable institutional rules will also be configured in the system. Sample or authorized academic records will be used during the initial setup and testing to ensure that the retrieved information is properly processed and displayed.

Students and authorized administrative personnel will undergo orientation on the proper use of the application. Student orientation will cover account access, academic record retrieval, viewing grades, GWA computation, academic standing, and scholarship eligibility results. Administrative personnel will be oriented on academic record verification, management of scholarship criteria, and monitoring of student academic information. Users will also be informed about the proper handling and protection of academic information to support secure and responsible system use.

Once the system has been configured and users have been oriented, the application may be deployed for use by SPCF students and authorized personnel, subject to institutional approval. Initial monitoring will be conducted to evaluate the system's performance, accuracy of retrieved academic information, correctness of GWA computation, and proper determination of academic standing and scholarship eligibility based on the configured criteria. The system will also be monitored for issues related to portal/API connectivity, data retrieval, and system functionality. If

access to the actual SPCF student portal, API, or academic records is not granted, testing and monitoring will be limited to authorized or controlled sample data.

3.6 Testing and Evaluation

In order to make sure that the mobile app designed for automatic verification of academic standing and scholarship eligibility meets all requirements and is accurate and reliable, the software will have to go through an extensive testing and quality assessment procedure. The testing process will be divided into two main components: System Testing and Verification and ISO/IEC 25010 Software Quality Evaluation.

System Testing and Verification

Prior to making the application available for evaluation by the users, the research team will do the technical testing based on various factors, keeping the test log of test cases, input, expected output, actual output, and pass/fail status. The tests are as follows:

Accuracy Testing - The process of comparison of the system's outputs, which includes computation of the GWA, classifications, and eligibility for scholarships against manual computations of the researchers to ensure accuracy of the math and logic used.

Integration Testing - Testing whether the authorized and read-only API is properly integrated into the student portal such that it can effectively get the necessary student records even if there are edge cases like missing records or other problems with the API.

Functional Testing - Methodical testing of all of the system's individual functional requirements such as login/logout, student/admin dashboards, criteria configuration, search and filter, and notifications. Performance

Efficiency Testing - Testing the responsiveness and efficiency of resource usage such as the loading time of the records, API fetching, and processing time of evaluation.

Evaluation of ISO/IEC 25010 Software Quality Model

After the successful technical evaluation, the application will be tested by the chosen users (students) and domain experts/administrators (Registrar and OSA staff) through the questionnaire-based evaluation, according to the ISO/IEC 25010 model developed by the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC). The model describes the product quality model, which offers a framework for defining, measuring, and assessing software and information systems product quality. The data will be collected on the 5-point Likert scale (from 1 = Strongly Disagree to 5 = Strongly Agree), and it will be analyzed using the descriptive statistics (frequency, percent, and mean). The evaluation is going to focus on the quality criteria of the ISO/IEC 25010 model in order to ensure that the mobile application meets all the necessary criteria:

Functional Suitability -Determines if the system offers functionality that satisfies the specified and implicit requirements when operated under specified conditions, thereby ensuring that all the functionalities of academic monitoring and evaluation of scholarships calculate the output correctly based on the configuration.

Performance Efficiency - Compares the performance in relation to the consumption of resources under specified conditions, including appropriate response time, effective API request processing, and optimal consumption of device resources.

Usability - Considers the extent to which a product can be used by the specified users to accomplish specified goals effectively, efficiently, and satisfactorily in the specified context of use, focusing on clear and user-friendly interfaces for both students and administrators.

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