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Grading System with SMS Notification for the College of Information, Communication and Trade Technology (CICTT) of Basilan State College

Reynaldo DR. Ferrer[1]
Basilan State College, 7300
Email address: ferrerreynaldo21@gmail.com

***Abstract*—** The Grading System with Short Messaging Service (SMS) Notification provides an efficient, fast, and cost-effective means of informing parents and students about academic performance. It enables users to monitor grades conveniently through mobile communication. The system is designed to accept, store, process, and distribute student grade information via SMS. It consists of one or more servers equipped with operating systems, interfaces, and the necessary business logic to support data management and communication. The primary goal of this system is to allow students to access their grades anytime and anywhere through SMS. It also supports two-way communication, enabling instructors to send grades and relevant updates directly to students. Grade data may be entered by the system administrator through a web-based interface, a mobile-based (SMS) interface, or integrated from third-party applications. Once received, the system processes and transmits the information immediately or at a scheduled time. This innovation aims to enhance the grading process by addressing inefficiencies in the existing manual system. With this system, students can conveniently monitor their grades at the end of each semester, while instructors can compute and submit grades more efficiently. The use of SMS notifications reduces the need for physical follow-ups and provides timely updates, allowing CICTT students to receive their grades quickly and reliably through their mobile phones.

***Keywords*—** *Grading System, Short Messaging Service (SMS), Academic Performance, Student Monitoring, Information System, Mobile Communication, Educational Technology.*

I. Introduction

The use of information and communication technology (ICT) has become increasingly important in improving how educational institutions manage information and deliver services. Technology has transformed administrative processes, including student record management, grading systems, and academic communication (Alaaraj & Ibrahim, 2021). In higher education, reliable and accessible information systems are essential in ensuring that students, teachers, and administrators can perform their functions efficiently (Ali, Khan, & Ahmed, 2020). Despite these advances, many colleges in developing areas continue to rely on manual methods for computing and releasing grades. This practice often leads to delays, errors, and communication gaps between instructors and students (Bello & Adeoye, 2019). Basilan State College (BaSC), a public higher education institution established in 1984 in Basilan Province, faces similar challenges. Within BaSC, the College of Information Communication and Trade Technology (CICTT) offers programs in computer science and trade technology, yet the grading process remains largely manual. To address this problem, the researchers propose a Grading System with Short Messaging Service (SMS) Notification. The system aims to automate grade computation and provide students with timely information about their academic performance through SMS alerts. This approach is both practical and affordable, especially in areas where internet access is limited. According to Kafyulilo (2019), SMS technology remains one of the most reliable tools for communication in contexts with weak digital infrastructure. It allows schools to deliver information instantly and reach users who may not have consistent access to online platforms.

The proposed system supports the goal of improving institutional efficiency, transparency, and student engagement. Ngugi and Muthoni (2020) note that mobile-based information systems help strengthen communication between institutions and their stakeholders, making services more responsive and inclusive. Similarly, Rahman, Hossain, and Akter (2022) emphasize that integrating SMS notification systems into academic settings can improve data accuracy and reduce the administrative burden on instructors. This initiative aligns with broader trends in digital governance. Indama (2023), in her study highlighted that the success of digital systems depends on good governance, proper infrastructure, and active participation of users. She found that technology-driven systems, such as e-government programs, improve service delivery by making information more accessible, transparent, and citizen-centered. Drawing from this perspective, educational institutions can adopt similar strategies to enhance communication and accountability in academic management.

In this context, the Grading System with SMS Notification seeks to modernize the grading process at Basilan State College by ensuring that students and parents receive accurate and timely information. The system represents a step toward digital transformation in higher education and demonstrates how technology can be used to improve the quality and efficiency of academic services.

II. Methods

This study employed a developmental research design anchored on the System Development Life Cycle (SDLC) model. The SDLC framework guided the researchers in systematically developing the proposed Grading System with SMS Notification. This approach was chosen because it provides a structured and sequential process that ensures each

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phase of system creation from problem identification to implementation is carefully planned and executed. The research began with the identification of the problem. In this stage, the researchers examined the existing grading process within the college and noted several challenges such as delays in grade encoding, limited access to grade updates, and lack of communication between instructors and students. Through observation and informal consultations with faculty and administrative personnel, the researchers confirmed the need for an automated system that would improve efficiency and provide real-time notifications to students.

Following the identification of the problem, the project planning phase was conducted. This stage involved defining the objectives, scope, and limitations of the proposed system, as well as determining the available resources, including manpower, software, and hardware requirements. A clear timeline and workflow were established to ensure that the development process would be properly monitored and completed within the target period. After planning, data collection was undertaken to obtain the necessary information for the system's design and functionality. The researchers gathered data through interviews, documentary reviews, and questionnaires. Interviews were conducted with faculty members and students to gather insights about the existing grading procedures and expectations for the proposed system. Documentary reviews of related studies, institutional policies, and references in system development were also performed to guide the technical and conceptual framework. Meanwhile, questionnaires were distributed to selected respondents to assess user requirements and preferences concerning accessibility, notification delivery, and interface design.

The next phase was the feasibility analysis, which determined whether the proposed system could be successfully implemented given the available resources and technical capacity of the institution. The feasibility study evaluated the project's technical, operational, and economic aspects to ensure that the system's anticipated benefits outweighed its projected costs. Once feasibility was established, the system design phase began. This stage involved translating the gathered requirements into a working blueprint, including the database structure, data flow diagrams, and interface layout. The goal was to develop an intuitive and efficient design that would allow faculty members to input and manage grades easily, while automatically sending SMS notifications to students once grades were finalized. The final phase of the SDLC was system implementation. During this stage, the system was coded and tested to ensure its functionality, accuracy, and reliability. Several test runs were conducted to identify errors or inconsistencies, and necessary adjustments were made based on feedback from the end users. After successful testing, the system was deployed for actual use, marking the completion of the development process.

Through these systematic stages of the SDLC, the researchers were able to develop a functional and user-centered grading system that promotes efficiency, accuracy, and transparency in academic communication within Basilan State College.

III. Results

The system was developed based on the data gathered from interviews, surveys, and questionnaires administered to instructors and stakeholders. These activities provided essential insights that guided the design and functionality of the system. The first phase of development involved identifying the problems inherent in the existing manual grading process. Faculty members reported difficulties in computing grades manually, which often led to errors and repeated calculations. The manual system also limited students' ability to monitor their performance in real time. Based on these findings, the researchers determined that a system capable of accurate and flexible grade computation, along with timely dissemination of information via SMS, would address these challenges effectively.

During project planning, the researchers reviewed the requirements necessary for developing the system. This included a detailed study of grading components such as assignments, quizzes, projects, attendance, recitations, and examinations. Various grading formulas used by instructors were documented to ensure that the system could accommodate multiple calculation methods. The decision to name the system Grading System with SMS Notification reflected its primary feature of automated grade computation coupled with immediate student notification. Data collection for system development was conducted through interviews, surveys, research, and questionnaires. Interviews with CICTT instructors revealed the specific components and formulas used in grade computation. In addition, consultations with the thesis adviser ensured that the system's design aligned with institutional requirements. Surveys and questionnaires provided feedback on user expectations regarding system functionality, usability, and SMS notification features. Respondents evaluated statements related to ease of logging in, registration of student information, accurate grade computation, error handling, SMS delivery, and overall satisfaction with the system. Usability testing assessed the interface's clarity, organization, and navigability, as well as the effectiveness of design elements, readability, and accessibility of menu options.

The functional requirements of the system include automated registration of student information, flexible grade computation, generation of total averages, and SMS notifications for timely communication. Nonfunctional requirements were also established, specifying technical needs such as Windows 8 or 10 operating systems, Intel Core i5 processors, 4GB RAM, and VB.net as the programming language. The design incorporated user-friendly interfaces, organized menus, and integrity controls to ensure data accuracy and security. Performance requirements were also addressed through dedicated modules for login, student registration, grading computation, reporting, and SMS information dissemination. Feasibility analysis indicated that the system is both operationally and economically viable. A cost-benefit approach confirmed that the anticipated benefits of reduced errors, time savings, and enhanced student engagement outweigh the resources required for system development and maintenance.

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System implementation involved installing the software on designated computers within the CICTT office as well as personal devices of instructors, ensuring that all hardware met minimum specifications. A one-day training program was conducted to familiarize faculty members with the system. This training included an overview of automated modules, step-by-step instructions on processing grades, and hands-on practice using previous student records to validate the accuracy of computations. Following installation, all modules were tested to verify correct database paths, error handling, and SMS delivery. The system also included provisions for ongoing maintenance, with developer contact information provided to address any post-implementation issues.

TABLE 1. *Functionality Test*

Statements	Mean Average	Verbal Interpretation
The system is easy to log in.	4.3	Effective
The system successfully registers all student information.	4.2	Effective
The system allows instructors to input grades for all components (assignments, quizzes, projects, etc.).	4.3	Effective
The system computes grades accurately according to the selected formula.	4.1	Effective
The system can generate the total average of student grades.	4.2	Effective
The system sends SMS notifications to students correctly.	3.8	Moderately Effective
The system displays error messages when incorrect data is entered.	4.0	Effective
The system updates grade records in real time.	3.9	Moderately Effective
The system allows modification of grade entries before final submission.	4.0	Effective
The system handles multiple grading formulas without errors.	4.1	Effective
The system prevents unauthorized access to sensitive student information.	4.2	Effective
The system stores student data securely.	4.2	Effective
The system provides clear feedback after each operation.	4.1	Effective
The system produces accurate reports for instructors.	4.2	Effective
The system supports efficient retrieval of past student records.	4.0	Effective
The system reduces the time required for manual grade computation.	4.3	Effective
The system allows instructors to review grades before sending notifications.	4.2	Effective
The system is compatible with all devices used by instructors.	3.8	Moderately Effective
The system can handle multiple users simultaneously without crashing.	3.9	Moderately Effective
The system meets my expectations in terms of functionality.	4.3	Effective

The results of the functionality test indicate that the Grading System with SMS Notification for the College of Information, Communication, and Trade Technology (CICTT) is generally effective in performing its intended functions. Most of the key features, including logging in (4.3), registering student information (4.2), inputting grades for all components (4.3), computing grades accurately (4.1), generating total averages (4.2), and reducing manual computation time (4.3), were rated as "Effective" by the respondents. This suggests that the system successfully automates core grading tasks, enhances efficiency, and provides reliable support to instructors in managing student grades. Certain functionalities received slightly lower ratings and were interpreted as "Moderately Effective." These include sending SMS notifications (3.8), updating grade records in real time (3.9), ensuring compatibility across all devices (3.8), and handling multiple users simultaneously (3.9). The lower ratings in these areas may be due to external factors, such as network connectivity issues affecting SMS delivery, variations in hardware used by instructors, and system performance under simultaneous multi-user access.

TABLE 2. *Usability Test*

Statements	Mean Average	Verbal Interpretation
The user interface is easy to navigate.	4.60	Very Effective
Menu options are clear and logically organized.	4.55	Very Effective
Buttons and links are easily recognizable.	4.50	Very Effective
The system layout is visually appealing.	4.45	Effective
Important features are easy to locate.	4.55	Very Effective
The text in the system is readable.	4.60	Very Effective
The system background and color scheme are appropriate.	4.50	Very Effective
System prompts are clear and understandable.	4.55	Very Effective
Instructions for using the system are easy to follow.	4.60	Very Effective
The system requires minimal technical skills to operate.	4.50	Very Effective
Users can complete tasks efficiently without confusion.	4.55	Very Effective
The interface provides quick access to frequently used functions.	4.50	Very Effective
Feedback messages are easy to understand.	4.55	Very Effective
The system is consistent in appearance and behavior across modules.	4.50	Very Effective
Navigation between modules is smooth and intuitive.	4.55	Very Effective
The system accommodates errors in a user-friendly manner.	4.50	Very Effective
Users feel confident operating the system after minimal instruction.	4.60	Very Effective
The system minimizes unnecessary steps in performing tasks.	4.55	Very Effective
Users can easily track progress while performing tasks.	4.50	Very Effective
I am satisfied with the usability of the system.	4.60	Very Effective

Hence, the system demonstrates strong functionality in meeting user expectations, particularly in accuracy, data security, feedback provision, and report generation (4.2–4.3). The moderately effective aspects highlight opportunities for

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improvement, such as optimizing SMS delivery, enhancing real-time updates, and ensuring smoother multi-device and multi-user performance. Addressing these areas would further strengthen the system's functionality and user satisfaction.

Table 2 demonstrates a high level of user satisfaction and system accessibility. Most of the usability criteria received ratings between 4.50 and 4.60, which were interpreted as "Very Effective." Specifically, features such as ease of navigation (4.60), readability of text (4.60), clarity of instructions (4.60), and user confidence after minimal instruction (4.60) indicate that the system is highly intuitive and user-friendly. Respondents also found menu options (4.55), accessibility of important features (4.55), and quick access to frequently used functions (4.50–4.55) to be very effective, suggesting that the system's design supports efficient and streamlined interaction. The system layout was rated slightly lower at 4.45, interpreted as "Effective," indicating that while the visual design is generally appealing, there may be minor areas for aesthetic improvement. Nevertheless, all other aspects, including button and link recognition (4.50), consistency across modules (4.50), error accommodation (4.50), and progress tracking (4.50), reinforce that the system is reliable and easy to operate.

Hence, the usability test shows that the system provides an intuitive interface, clear instructions, and smooth navigation, allowing users to complete tasks efficiently with minimal technical skills. These findings suggest that the system successfully meets the usability needs of instructors and ensures a positive user experience, contributing to overall satisfaction and effectiveness in academic operations.

IV. Conclusions and Recommendations

Based on the results of the usability tests, system evaluation, and surveys conducted, the proponents conclude that the system successfully addresses the limitations of the existing manual grading system. The system demonstrated accuracy in computing student grades, flexibility in accommodating different grading formulas, and reliability in sending notifications via SMS. Respondents reported that the system is user-friendly and easy to operate, requiring minimal technical knowledge, which ensures that faculty members can perform tasks efficiently without extensive training. The functionality, reliability, and usability assessments indicate that the system can effectively manage student grade computation and dissemination, reducing the likelihood of errors associated with manual processing. Although minor challenges such as network delays were noted during SMS transmission, these issues were external and do not diminish the system's overall effectiveness. Hence, the system enhances transparency, promotes timely communication with students, and provides a convenient method for monitoring academic performance. The study also confirms that automated grading systems integrated with mobile notification features can significantly improve administrative efficiency and student engagement. The findings suggest that digital solutions in academic environments can facilitate better information management while supporting both instructors and students in achieving educational objectives.

Recommendations

The researchers recommend the full implementation of the Grading System to replace manual grading processes. Faculty members should adopt the system to compute grades, disseminate results promptly, and minimize errors associated with manual computations. It is also recommended that future enhancements consider expanding the system's capabilities to allow students to query their grades directly through SMS, making the system accessible via mobile devices. Additionally, broadening the system's functionality to include features such as reporting, analytics, and integration with other academic management platforms can further improve its utility and efficiency. Continuous monitoring and feedback collection from users are advised to identify potential improvements, address technical issues, and ensure the system remains responsive to the evolving needs of faculty and students. Periodic maintenance and updates should be conducted to enhance performance, security, and reliability of the system. Finally, the study encourages the integration of similar automated systems across other departments within Basilan State College to promote standardized, efficient, and transparent academic processes institution-wide.

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