



INTERNATIONAL JOURNAL OF ADVANCE RESEARCH, IDEAS AND INNOVATIONS IN TECHNOLOGY

ISSN: 2454-132X

Impact Factor: 6.078

(Volume 9, Issue 5 - V9I5-1179)

Available online at: <https://www.ijariit.com>

Analysis of the Effectiveness of the Digital Enrollment and Grading System

Mary Jane Pagay Cierva

bist.registrar2029@gmail.com

Southern Leyte State University, Southern Leyte,
Philippines

Rhoderick D. Malangsa

rmalangsa@southernleytestateu.edu.ph

Southern Leyte State University, Southern Leyte,
Philippines

ABSTRACT

The Digital Enrollment and Grading System of Bato Institute of Science and Technology is a comprehensive platform that helps manage all aspects of student enrollment and grading. It provides an efficient way to store and manage student data, grade reports, and enrollment records, ensuring that all relevant information is tracked from the beginning of a student's course until the end. The system uses a completely computerized process, reducing the chance of human error and maintaining accurate data. The system also includes a backup system that allows for the retrieval of important information in case of any system malfunctions, ensuring that student and organizational data is secure. There are two access modes: administrator and user. The administrator module is responsible for maintaining the system by creating user accounts, scheduling system updates, and making sure everything runs smoothly. The user module allows staff and students to access their grades and other reports. To evaluate the system's effectiveness, the researcher used Descriptive Developmental Research to gather feedback from both staff and students. Based on the results of the data, the researcher concluded that the Digital Enrollment and Grading System is highly effective with a "very good" rating. However, there is always room for improvement in any system to prevent potential issues. Therefore, the researchers recommend continuous evaluation and improvement of the platform to maintain high standards of service and efficiency. In conclusion, the Digital Enrollment and Grading System of Bato Institute of Science and Technology is an efficient and effective platform that meets the needs of both staff and students, providing a valuable solution for managing enrollment and grading processes.

Keywords: Computerization, Management System, Digital Enrollment, Web-based System

1. INTRODUCTION

The advent of computer innovation has opened a modern chapter in innovative advances that make computers part of everyday life. Computers make all our lives simpler so that we can all live great lives. Computers are all over at work, at school, and at home. The educational framework has taken advantage of technology in educating and learning, preparing information, record keeping, and enrollment systems.

The Digital Enrollment and Grading System is highly effective in integrating all important processes, transactions, and academic regulations of the institution, resulting in the effective transmission of useful and viable data. It provides all the necessary features and flexibility that modern leading institutions demand. In today's demanding environment, there is a continually growing necessity to achieve goals while also enhancing adaptability to drive innovation and growth, which is exactly what this system provides.

Today, manual enrollment and updating of student records at the Bato Institute of Science and Technology have been replaced with computerized systems. This change was made because the enrolling officer would spend a significant amount of time searching through filing cabinets to find student records. However, this process caused delays in assessing students' previous grades and led to the loss of some records. Additionally, tallying subjects took longer due to the disorganized nature of the student records. In the present digital era, online registration has become the standard practice, allowing for the issuance of electronic notifications of results, transcripts, and university applications through the web (Uka & Nwabueze, 2019).

According to Custodio and Castro (2016), enrollment procedures in many universities, not only in the Philippines, are still carried out manually, even though the internet and other advanced technologies have been introduced. The objective of this research is to create and establish an online registration and grade evaluation system to assist in improving the Pre-Enrollment Procedure. The developed system can support the different colleges within the University with their enrollment procedures, thereby reducing inaccuracies and errors.

The school offers a variety of access and ensures accurate student accounts through the use of campus registration methods. By utilizing a registration system, schools can easily monitor the requirements of both schools and students. The system's capabilities strongly recommend that respondents should continue its implementation (Nuevo, 2021).

According to Kenyi (2010), it is impractical to store students' records, conduct certificate verification, facilitate final clearance, and process transcripts using paper forms. This method requires manual access and processing, along with sending the documents through the postal service. To enhance efficiency, reliability, and cost-effectiveness in managing students' academic transactions, an online student record management system has been introduced for tertiary institutions.

According to Sestina and Luna (2015), utilizing an information system in a college not only reduces paperwork for greater efficiency but also assists the college administration in the decision-making process by allowing easy generation of reports and other management information from the system. An automated enrollment system is a system in which computers play a significant role, and this type of system is now needed by every institution, as well as companies. It is the ideal method for storing and retrieving data on a server or hard disk, rather than relying on paper and file cabinets. This will aid institutions in generating the quick and efficient data they require (Balcita & Palaoag, 2020). The software that has been created has a user interface that is simple and useful. It enables the regulation of data management, retrieval, and manipulation. It will make the task of managing data easier compared to the manual maintenance of documents. This work helps save time and reduces paperwork (Fadhil, 2016).

Even though the online system is a definite improvement compared to paper-based rubrics, it has also been demonstrated that minor details can hinder efficiency, which in turn affects user satisfaction. Additionally, the system needs to be compatible with mobile devices, however, this requirement has not yet been addressed.

Implementing a school management system to enhance school administration, showcases the vital components of school administration. School leaders possess the ability to direct and cultivate all the components of a comprehensive school. Utilizing ICT effectively and efficiently in school management procedures, rather than merely as a replacement for a typewriter or a display (Setiawan et. al., 2017). The database management system has helped normalize the flow of data in the system and organize attendance diagrams for employees. This has resulted in more accurate monitoring and tracking of attendance. To fully utilize the system's capabilities in a networked environment, it is suggested that additional face recognition devices be acquired and the developed system be implemented promptly. This implementation should be done not only in the CSIT Department but also on the SLSU Sogod Campus (Malangsa, 2014).

Doe (2019) studied the implementation and evaluation of an online grading management system in higher education. The objective of the study was to determine the effectiveness of the new system when compared to traditional grading methods. The study observed that the online grading system enhanced efficiency, accuracy, and speed in grading and record-keeping procedures, ultimately resulting in a more effective evaluation of student performance.

Lee and Kim (2018) conducted a study aimed at enhancing the examination and grading system through an online platform. The study primarily concentrated on the advantages of utilizing an online grading system, chiefly encompassing the standardization of grading, timely delivery of feedback, and higher levels of student engagement. The findings of the study ultimately determined that an online grading system yields noteworthy benefits in terms of enhancing the grading process, fairness, accuracy, and delivering prompt feedback to students.

Smith, Johnson, and Lee (2020) conducted a study to assess the effectiveness of an online grading system in high schools. They utilized a comparative analysis approach. The findings indicated that teachers who had access to the online grading system displayed a greater degree of accuracy in evaluating students' work. Moreover, they showed enhanced efficiency in managing and recording grades, as well as providing better feedback. Conversely, the traditional grading method exhibited several limitations. Consequently, the study suggests the implementation of an online grading system in high schools as a means to enhance academic performance and streamline grading procedures.

According to (Nuevo, 2021) the analysis is fully adaptable so that the reader can see the data and knowledge collected. This study examined the creation of values and ideas. This is a systematic task that relies on information established from the research. In addition,

we gained the practical knowledge to develop new approaches and reliable results. The purpose of the study is to enhance the effectiveness of campus registration methods and systems.

Web-based enrollment in surveys and studies is becoming more appealing as the Internet approaches near-universal coverage and respondents' attitudes toward traditional modes of study deteriorate (Keiding & Louis, 2018). Universities should begin to think about planning the development or use of student information systems that are generally recognized by SIS and are consistent with best practices while expanding their database services (Bigirimana et. al., 2016).

In this study, the researcher aims to evaluate the effectiveness of the developed digital enrollment and grading system of the BIST. The primary goal is to determine whether this system provides a high level of quality or requires rectification for improvement.

2. CONCEPTUAL FRAMEWORK

The input framework is composed of requirements in terms of the user, software, and hardware. The user requirements consist of the username and password of the authorized personnel. The system will run on an operating system that must be Windows 7 or higher. The researcher has searched for concepts and theories to come up with the appropriate theoretical framework. A theoretical framework identifies how an existing system and its cycle work. It is only possible to come up with a new system by understanding the cycle of the existing system's flow.

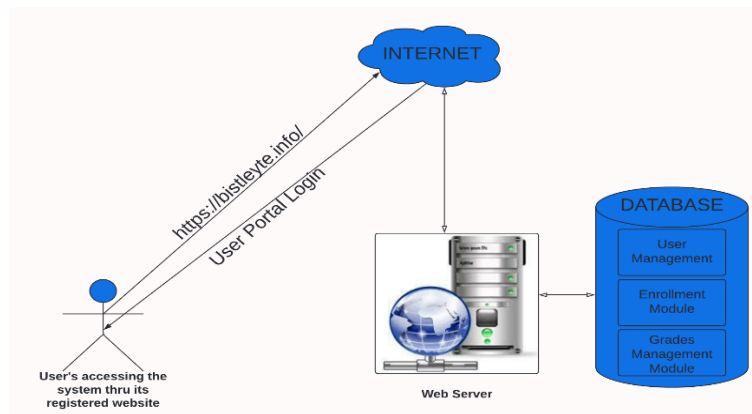


Figure 1: Conceptual Design of the System

Figure 1 is the conceptual design of the Digital Enrollment and Grading System of Bato Institute of Science and Technology. It is a comprehensive system that encompasses all aspects of student record-keeping, grading, and enrollment. The design features a user-friendly interface with two access modes: administrator and user. The administrator profile manages the system's work and has the right to view and edit all information stored in the system. The system's user profile gives students access to register for courses and view their records, grades, and other relevant reports.

The system's architecture is designed to allow ease of use and functionality. It features a database that stores all relevant data about the students, including enrollment, course history, grades, and other relevant personal and academic information. The system utilizes a computerized process, reducing human error and ensuring accuracy throughout the system.

Security is a key feature of the system's design, with a password-protected login requiring a user ID and a password. This feature allows the system to prevent unauthorized access to confidential information, ensuring student and organizational data is protected. The system's backup design ensures data is easily recoverable in the case of a system malfunction, protecting against data loss.

The conceptual design of the Digital Enrollment and Grading System of Bato Institute of Science and Technology aims to provide a fast, efficient, and reliable system for managing student enrollment and grading processes. The design features user-friendly modes of access for both staff and students, ensuring accurate, secure, and timely updates to student records.

Table 1: Hardware and software components

SYSTEM REQUIREMENTS	SPECIFICATION:
System Unit	Recommended Requirements: Processor: Intel core i3 3.1Ghz Ram: 4 GB Hard disk: 500 GB Operating system: Windows 7, 8, 8.1, 10 Minimum Requirements: Processor: Intel dual core / AMD Athlon II Ram: 2.0GB Hard disk: 250GB Operating system: Windows 7

Monitor	AOC Monitor or any monitor with at least 17"
Mouse	A4Tech
Keyboard	Genius Keyboard
Technology	Microsoft Visual Studio 2008
Database	MySQL
Tools	Microsoft Visual Studio 2008
	Any antivirus software
	Back-up and Data Recovery Software
Others	Uninterruptible power supply to ensure constant access to data
	Printer

It is shown in Table 1 the hardware and software components of a computer system that are required to be installed to use the software efficiently. The minimum requirement for the hardware can be anything if it contains at least 4GB of RAM, has a processor (from maybe 2008 or later), and enough disk space.

As shown in Figure 2, the student's information, enrollment form, and grades are inputted into the system of the developed Digital Enrollment system using the users' portal. The process focuses on how students are enrolled and the encoding of grades. These systems help support students with educational needs such as course and subject references.

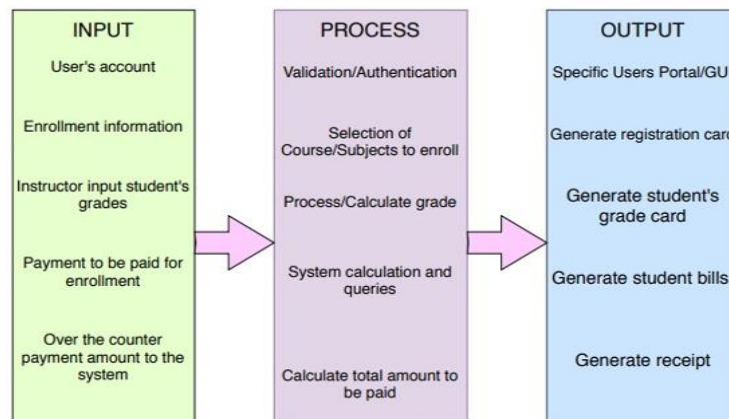


Figure 2: Input Process Output (IPO) Diagram

These diagrams are used to visually display the inputs, processes, and expected outputs of a system in a tabular format. Input is data that is to be either entered into the system by a user or obtained from another location in the system. A process is a series of steps or operations that will be applied to the input data to convert it into the desired output. The output is data that has been turned into information after processing, which is the whole purpose of the software.

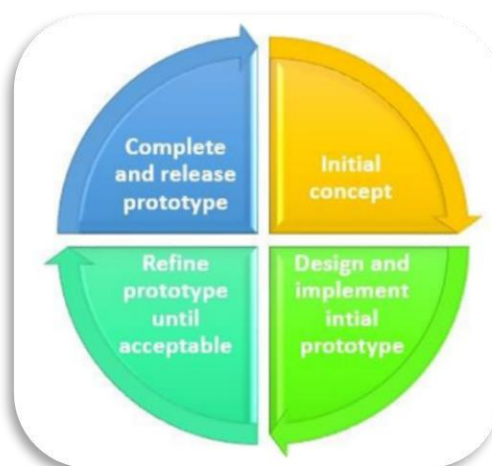


Figure 3: Evolutionary Prototyping Model

The researcher used Evolutionary Prototyping as a Software Development Life Cycle (SDLC) model that emphasizes a continuous gathering of requirements to build a product or system through an initial prototype and a succession of refinements. Creating a prototype using the most visible aspects of the system (starting with the GUI) is often designed first. Prototyping is an attractive and feasible model

for those complex systems that use a manual process for determining the requirements. Prototype development is based on currently known requirements. The prototype gives the client the actual feel of the system. It also helps clients to have a better understanding of the desired system requirements. Prototypes allow the customer to view early versions of the system and allow acceptance, feedback, or updates to requirements for the next sprint without spending a lot of time and money on a working model. As the prototype evolves over each sprint, the requirements are refined through prototype review meetings until enough work has been completed and the product owner has agreed to release the product. Evolutionary development allows for incremental, sustainable, and visible signs of progress.

3. MATERIALS AND METHODS

The researcher uses the Descriptive Developmental Research Method, wherein the study focuses on present situations. It involves the description, analysis, and presentation of the present system, its composition, and processes of phenomena. Descriptive statistics are used to describe the basic features of the data in a study. They provide simple summaries of the sample and the measures. The Descriptive Developmental Research Method is more on analyzing the existing system, and through this method, the researcher will be able to know how the existing system operates. It describes and analyzes the systematic procedure of human activities. It is very important to determine the activities to identify the problems and weaknesses of the existing system and, at the same time, to devise a solution to the problems encountered. The solution will be associated with the proposed system.

The researcher conducted a personal visit to the BIST institution to ask permission for the system to be evaluated. An interview has been conducted to gather information to support the validity of the data. The researcher created a list of questions that expose the system by category. All the respondents were asked to complete the questionnaire survey and answer it to the best of their knowledge. They were given the link through group chat and messenger to gather the data and allow time to complete the forms. The survey forms were then collected for encoding and tabulation of responses to facilitate the analysis during the interpretation of the data. After the researcher got the questionnaires, the researcher calculated the percentage. The statistical tool is used to have a general view of the whole scenario of the study. This also includes the scaling system, which was used by the researcher as a technique to monitor the respondent's interpretation of facts. The Likert scale was used to interpret items in the questionnaire. These responses were based on the respondents. The range and the interpretation of the five-point scale are shown in Table 2.

Table 2: The Five-point Likert Scale

Scale	Range	Interpretation
5	4.6 - 5.0	Excellent
4	3.7 - 4.5	Very Good
3	2.8 - 3.6	Good
2	1.9 - 2.7	Fair
1	1.0 - 1.8	Poor

4. RESULTS AND DISCUSSIONS

The researcher surveyed the school. The survey aims to evaluate the system's performance so that further enhancements can be considered. One thousand three hundred nine (1309) respondents answered the questionnaire and participated in the study.

Table 3: Respondents of the Study

Designation	Frequency	Percentage
Faculty	145	11%
Students	1164	89%
Total Number of Respondents	1309	100%

The users were asked to use any kind of web browser like Google Chrome, Mozilla Firefox, and Microsoft Edge to access the web page to conduct a test in terms of the efficiency of the system. Each user will be asked to log in to their portal as part of the testing. See the figure and table below for Input and Output Reports and Analysis.

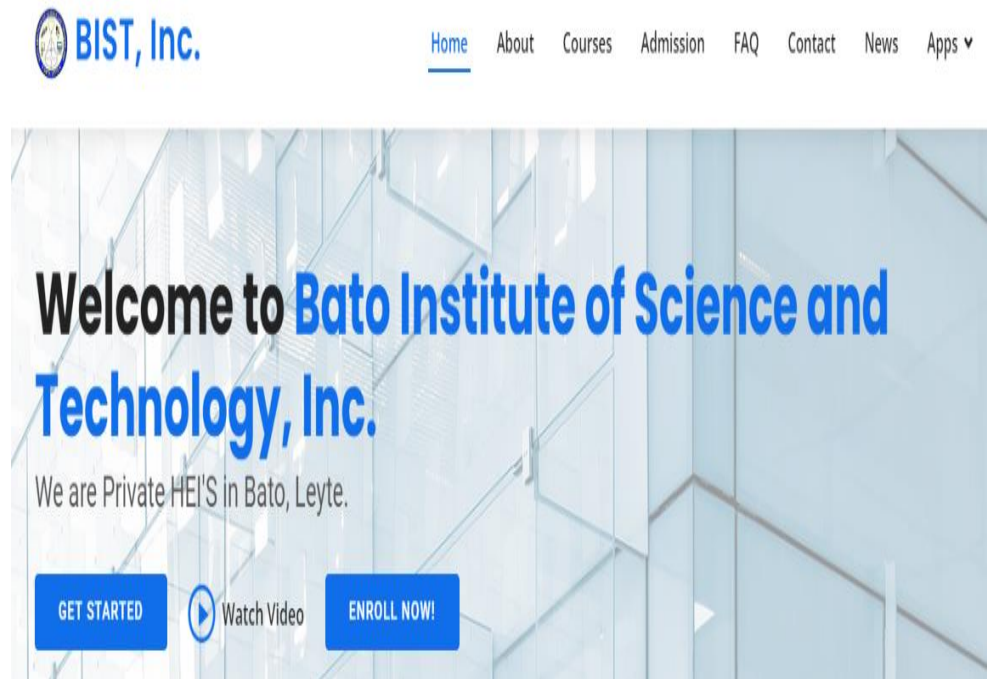


Figure 4: Official website of the school

Figure 4 is the official website of the Bato Institute of Science and Technology, wherein the users and viewers can see the details regarding the school. Such as the courses offered, requirements for admission, advertisements as well as the enrollment procedure. The registered users, like the students and the teachers, will access this site to log in to their portal.

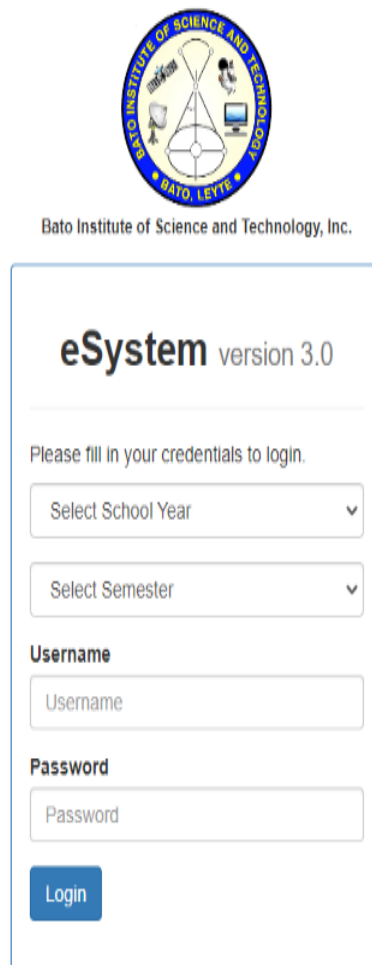
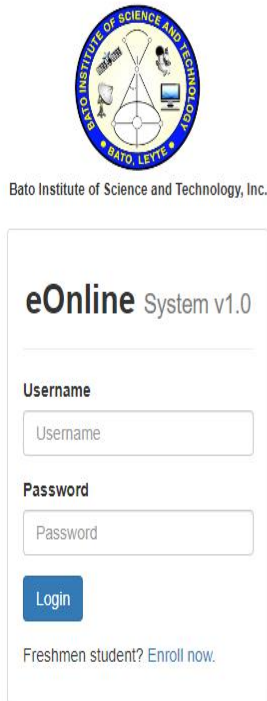


Figure 5: Login screen (Registrar/Admin)

Figure 5 is where the registration for the students can be accessed. The user needs to log in using the username and password created by the system administrator. The assigned person for registration can input the student's information and print their certificate of registration. All the transactions of the registrar can also be done here. The registrar has full access to this module.



Enrollment Procedures



Figure 6: Login screen (Student)

Figure 6 is where a registered student can log in to their portal. The student needs to log in using the username and password created by the registration officer.

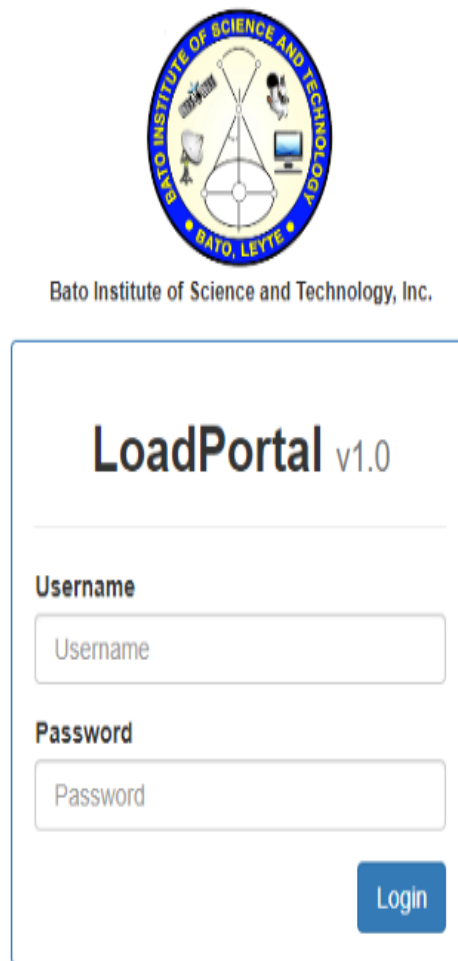


Figure 7: Login screen (Instructor)

Figure 7 is the login for the instructor using the username and password created by the admin of the system. Once successfully logged in, they can view the class schedules.



Figure 8: Instructors Portal

In Figure 8, the instructor can view the number of classes as well as the list of students enrolled in each class. All the subject’s load and the assigned schedule will be displayed in this menu. This will also allow them to encode and update the student’s grade.

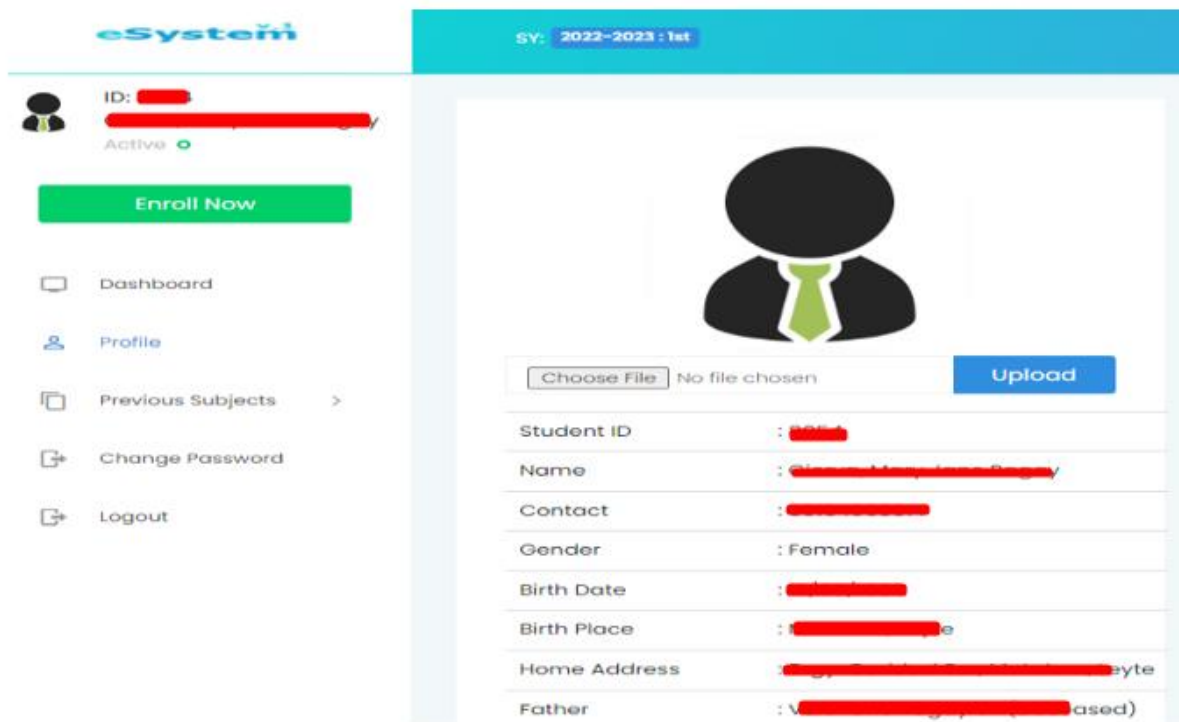


Figure 9: Student Portal

Figure 9 is where the student can log in. Once logged in successfully, they will be directed to their portal where they can view their account once the admin or the registration officer has added them into the student back-end of the system as a validation of their legitimacy as an officially enrolled student in the institution. This is where the student can view their personal information and even choose their desired profile picture. They can also check their grades from the previous semester and can enroll in the subjects they want to enroll in.

This portion analyses and interprets the data from the users' evaluation of the Enrollment and Grade System of the Bato Institute of Science and Technology, which they used during the online survey.

Table 4: Efficiency – Question 1. The system can respond in 0.1 seconds.

Interpretation	Frequency	Range	Percentage
Excellent	380	1.45	29%
Very Good	383	1.17	29.3%
Good	387	0.89	29.6%
Fair	121	0.18	9.2%
Poor	38	0.03	2.9%
Total	1309	3.72	100%
Interpretation			Very Good

Table 5: Efficiency – Question 2. The device does not "hang" or "lag" when accessing different features of the system.

Interpretation	Frequency	Range	Percentage
Excellent	399	1.52	30.5%
Very Good	361	1.10	27.6%
Good	369	0.85	28.2%
Fair	131	0.20	10%
Poor	49	0.04	3.7%
Total	1309	3.71	100%
Interpretation			Very Good

From the data above, the results of the student's evaluation in terms of efficiency can be observed. It can be noted that the system was rated "Very Good," considering whether the system can respond in 0.1 seconds and whether the device does not "hang" or "lag" when accessing different features of the system.

Table 6: Usability– Question 1. The system is easy to understand.

Interpretation	Frequency	Range	Percentage
Excellent	527	2.01	40%
Very Good	361	1.10	28%
Good	343	0.79	26%
Fair	52	0.20	4%
Poor	26	0.7	2%
Total	1309	4.17	100%
Interpretation			Very Good

Table 7: Usability– Question 2. The system is easy to learn by different users (beginners or experts).

Interpretation	Frequency	Range	Percentage
Excellent	482	1.84	30.5%
Very Good	360	1.10	27.6%
Good	368	0.84	28.2%
Fair	78	0.11	10%
Poor	21	0.02	3.7%
Total	1309	3.91	100%
Interpretation			Very Good

Table 8: Usability– Question 3. The system can be opened in different browsers

Interpretation	Frequency	Range	Percentage
Excellent	633	2.42	30.5%
Very Good	334	1.02	27.6%
Good	222	0.51	28.2%
Fair	86	0.13	10%
Poor	34	0.03	3.7%
Total	1309	4.11	100%
Interpretation			Very Good

It shows that the overall remarks and Interpretation is "Very Good." Based on the survey results, the system became more effective as it was implemented and thus received positive feedback.

5. CONCLUSION AND RECOMMENDATIONS

The researcher believes that rapid changes in technology today present opportunities to make everyday life easier at home, school, and work. Computer resources have been valuable in industries by providing accurate and secure information. Some schools have already utilized these resources to create a simple and precise record and enrollment management system. This study aims to evaluate the efficiency of the Digital Enrollment and grade system to determine if the current BIST system maintains a high level of quality. Additionally, it aims to create a system that can minimize or eliminate the drawbacks of the manual process and demonstrate that the system is both technically and operationally feasible. It is also expected that there will be an enhancement in the efficiency of the current system.

Based on the results gathered, it can be concluded that the system's efficiency could be improved by updating and making certain aspects better. Specifically, the system should be capable of being opened on various devices to be perceived as more efficient by its users. The design should be optimized to work seamlessly on other devices, such as smartphones, tablets, and laptops, to cater to the different needs and preferences of users. These improvements will enhance the accessibility and convenience of the system for users who prefer

using different types of devices to access it. A recommendation has been made based on the derived conclusions. Even if the users approve and the system produces the desired outcome, it should be given high priority because efficiency contributes to its overall performance. Surveying the system's performance can help improve its efficiency in utilizing potential input data to achieve the highest quality and maximum output. By enhancing these aspects of the Digital Enrollment and grade system, the user experience can be significantly improved, making the system more efficient, functional, and user-friendly. The less resources the system requires to produce results, the better it will be.

6. ACKNOWLEDGEMENT

I am extremely grateful to our all-powerful Father for the excellent health and well-being necessary to complete this research. I take this moment to express my sincere gratitude to all the respondents who generously dedicated their time and effort to share their valuable responses to the survey. I would like to thank Miss Magdalene Unajan, Dr. Frederick C. Aniga, and Miss Bacalla, who formed our esteemed panel, as well as Dr. Rhoderick D. Malangsa and Mrs. Veronica Lumbre Reoma our esteemed adviser for this research, for their unwavering guidance and provision of essential insights throughout our research journey. I want to extend my deepest appreciation to Mr. Joselito Q. Borong, the school registrar, Dr. Josephine K. Germano, the school president, Miss Alexa Erine Joyce G. Lecaros, the executive vice-president, Arch. Ernesto K. Germano Jr., the budget officer, and Mrs. Marie Cris C. Germano, the finance officer of Bato Institute of Science and Technology, for graciously accepting our research project to be conducted at their esteemed institution. Above all, I want to express my sincere gratitude to all the authors whose works we referenced, as we deeply appreciate the wealth of information they provided. This research would not have been possible without the collective support, guidance, and contributions of these remarkable individuals and institutions. Thank you for playing a pivotal role in our pursuit of knowledge and the successful completion of this research project.

7. REFERENCES

- [1] Balcita, R., & Palaoag, T. (2020) Integration of School Management Systems Using a Centralized Database (ISMSCD). *International Journal of Information and Education Technology*, Vol. 10, No. 9.
- [2] Bigirimana, S. & Jagero, N. & Zulu, C., S., (2016). An Assessment of the Impact of the Centralised Electronic Student Records Management System at Africa University, Mutare, Zimbabwe. *Issues in Economics and Business*. 2. 1. 10.5296/ieb.v2i2.10490.
- [3] Custodio, E.B. and Castro, M.D.B. (2016). Advancing Pre-enrollment Procedure through Online Registration and Grade Evaluation System. *International Journal of Signal Processing Systems*, Vol. 4, No. 5, DOI: 10.18178/ijsp.4.5.399-404
- [4] Doe, J. (2019). Implementation and Evaluation of Online Grading Management System for Higher Education. *International Journal of Emerging Technologies in Learning*, 14(20), 174-182. <https://doi.org/10.3991/ijet.v14i20.10776>
- [5] Kenyi, M.G. (2010). College Information System - University_of_Juba. Retrieved October 29, 2021, from <https://bit.ly/3aHgAiX>
- [6] Fadhil, Heba. (2016). Design of Computerized Students Grades Database Management System. *International Journal of Science & Engineering Development Research*. 1. 343 - 349. Retrieved October 7, 2021, from <https://bit.ly/3ATiuI8>
- [7] Keiding, N & Louis, T. (2018). Web-Based Enrollment and Other Types of Self-selections in Surveys and Studies: Consequences for Generalizability. *Annual Review of Statistics and Its Application*. 5. 10.1146/annurev-statistics-031017-100127.
- [8] Lee, H., & Kim, S. (2018). A Study on the Improvement of the Examination and Grading System Based on Online Platform. *Advances in Social Science, Education, and Humanities Research*, 60, 74-79. 10.2991/iccdea-18.2018.15
- [9] Malangsa, R. (2014). Development of Face Recognition Time Monitoring and Attendance System. *Journal of Science, Engineering, and Technology (JSET)*, 2, 33-43.
- [10] Mina, J. & Campos, R. & Reyes, E. J. & Garcia, M. & Torres (2021). Students' Assessment of the Digital Enrollment System of Nueva Ecija University of Science and Technology: An Experienced Based. Retrieved October 16, 2021, from <https://bit.ly/3aLREa9>
- [11] Nuevo, K. R. (2021). Student's Evaluation of the Davao del Sur State College's Digital Enrollment System. 10.13140/RG.2.2.11453.79844.
- [12] Setiawan, W. & Munir, M. & Senen, S. & Nugroho, E. & Wihardi, Y. & Nugraha, E. (2017). Strengthening of Indonesia School of management in the 21st century through the implementation of school management system-based information technology and communications integrated. *AIP Conference Proceedings*. 1848. 060020. 10.1063/1.4983988.
- [13] Smith, J., Johnson, C., & Lee, S. (2020). Evaluating the Effectiveness of an Online Grading System for High Schools: A Comparative Analysis. *Journal of Educational Technology & Society*, 23(2), 56-65. <https://www.jstor.org/stable/26905059>
- [14] UKa, K. & Nwabueze, E. (2019). Web-Based Students' Record Management System for Tertiary Institutions. Retrieved from: <https://bit.ly/3j6YZ8T>

BIOGRAPHIES



Mary Jane P. Cierva is currently in her second year of master's studies leading to the degree of Master of Science in Information Technology (MSIT) at Southern Leyte State University-Main Campus, Sogod, Southern Leyte. She is also currently working as the assistant registrar and part-time instructor at Bato Institute of Science and Technology, Dolho, Bato, Leyte. Her email address is bist.registrar2029@gmail.com



Rhoderick D. Malangsa, DIT is the Director of Graduate Studies at Southern Leyte State University-Main Campus, Sogod, So. Leyte. He earned his doctorate de Doctor in Information Technology from Cebu Institute of Technology University, Cebu City. His area of research is on Data mining (Business Intelligence), Fuzzy Logic, and Artificial Neural networks. His email address is rmalangsa@southernleytestateu.edu.ph