

Online Tuition Fee Assessment and Monitoring System with SMS Notification and Confirmation

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Abstract: The management of tuition fee assessment and payment monitoring is an essential function of educational institutions, as it directly affects financial operations and stakeholder satisfaction. Lyceum of Southern Luzon – Balayan Campus currently utilizes a manual process for tuition fee assessment and monitoring, which often results in difficulties such as delayed payment verification, inaccurate or outdated records, lack of timely notifications, and challenges in tracking outstanding balances. To address these concerns, this study developed an Online Tuition Fee Assessment and Monitoring System with SMS Notification and Confirmation that automates tuition fee computation, payment monitoring, and real-time communication with students and parents through Short Message Service (SMS). The study employed the Agile Software Development Methodology, consisting of the requirements, design, development, testing, deployment, and review phases. Data were gathered through interviews and surveys conducted among students, parents, and school personnel to identify existing issues and evaluate the developed system. The system was designed to provide online access to tuition fee assessments, payment records, balance monitoring, and automated SMS notifications for payment confirmations and due-date reminders. Results revealed that the major problems encountered in the existing process included difficulty in tracking outstanding balances (99%), lengthy manual assessment and payment confirmation procedures (94%), and payment verification issues caused by lost receipts (92%). Evaluation of the developed system showed that respondents highly recognized its benefits, particularly the effectiveness of SMS notifications in keeping students and parents informed about payment deadlines and balances (99%), as well as providing quick access to tuition fee information (98%). Based on the ISO 9126 software quality standards, the system demonstrated high levels of efficiency, functionality, and reliability, with most respondents expressing satisfaction with its performance and usability. The study concludes that the developed system significantly improves tuition fee assessment and monitoring processes by enhancing accessibility, transparency, accuracy, and communication between the institution, students, and parents. The integration of SMS notification and confirmation features contributes to better financial awareness and timely payment compliance, making the system a valuable tool for educational financial management.

Keywords: tuition fee assessment, tuition fee monitoring, SMS notification, payment confirmation, web-based information system, Agile methodology, educational financial management, ISO 9126, student information system, online monitoring system.

I. INTRODUCTION

In the fast-paced digital era, educational institutions continuously seek innovative solutions to enhance administrative efficiency and improve student services. One critical aspect of school administration is tuition fee assessment and monitoring, which ensures timely payments and financial transparency. However, traditional manual systems for fee assessment often lead to inefficiencies, errors, and delays in processing payments. These challenges can result in financial discrepancies and miscommunication between students and the institution (Al-Hassan and Ndzingo, 2021)^[1].

Tuition fee assessment and monitoring are critical for ensuring financial stability and smooth academic operations in the Lyceum of Southern Luzon Balayan Campus. The school implements the manual process of tuition fee assessment and monitoring. In this process, the students or the parents need to inquire personally in the school for them to know the tuition

fee for each course. The total tuition fee is provided but there are times that the parents or students are not aware of the breakdown of the tuition fee during their inquiry. The only way for them to be informed about the tuition fee amount is when they enrolled in the school. In terms of monitoring the tuition fee payments of the students, parents cannot guarantee if the tuition paid is the exact tuition fee amount. There are times that the student lost the receipt that's why the parents cannot confirm if they really paid the tuition fee. They need to visit the school to confirm it personally if the payment for the tuition fee was made.

To address these concerns, this study proposes the development of an "Online Tuition Fee Assessment and Monitoring System with SMS Notification and Confirmation". The system aims to help in tuition fee computation, real-time payment tracking, and providing automated SMS notifications for balance updates and due dates. By integrating online and mobile communication technologies, the system enhances accessibility and ensures that students receive timely financial reminders, ultimately reducing late payments and improving financial management within the institution.

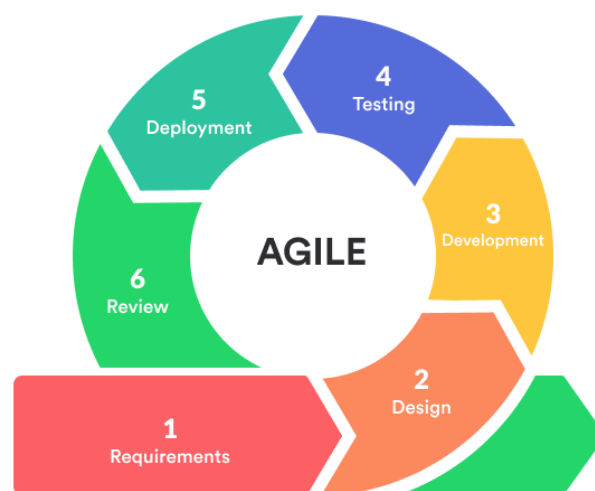
The implementation of an automated tuition fee assessment system aligns with the increasing adoption of financial technology (FinTech) in the education sector. With the incorporation of SMS notifications, this system also strengthens student engagement by providing real-time updates and reminders, which contribute to better financial responsibility among students and parents (Sharma and Gupta, 2021)^[2].

The study is aligned to SDG No. 4 which is Quality Education. The system would help the parents to have an easy way of monitoring tuition fee payments of their child. Paying the tuition fee ensures that students can continue to have access to quality education. The system is also aligned to SDG No. 17 which is Partnerships for the goals. The researchers would establish partnership with Lyceum of Southern Luzon Balayan Campus to have a system that would help not just the school but also its stakeholders.

This project would explore the development, implementation, and evaluation of the developed system to determine its effectiveness in addressing tuition fee monitoring challenges. Through this study, the institution can utilize technology to enhance its financial processes, ensuring a smooth and user-friendly experience for both students, parents and school personnel.

II. METHODOLOGY

The researchers adopted the Agile Methodology for the development of the Online Tuition Fee Assessment and Monitoring System with SMS Notification and Confirmation due to its iterative, flexible, and collaborative nature. Agile allows continuous feedback and adaptation, which is essential for meeting user needs effectively throughout the project lifecycle. Below is a breakdown of each phase in the Agile process as applied in this project:



<https://indevlab.com/blog/what-is-agile-development/>^[31]

Figure 1. Agile Software Development Methodology

Requirements Phase

In this initial phase, the researchers gathered and analyzed the essential system requirements through consultations and interviews with stakeholders such as school administrators, students, and parents. The researchers conducted interviews to the target users in Lyceum of Southern Luzon Inc. – Balayan Campus. The stakeholders shared the manual process as well as the problems they encountered. Ideas from the stakeholders were consolidated and considered by the researchers.

Design Phase

During this phase, the researchers planned the system. Here, they created the data flow diagram which would be followed on the development of the system. This phase also considered the data gathered from the target users of the website. The problems encountered by the target users were analyzed. The researchers also planned on how they would incorporate the solutions they have in mind to the website.

Development Phase

This phase includes the coding process. Here, the developers created the functions required to solve the problems in the current process of tuition fee assessment. The researchers utilized different applications (Xampp and Notepad++) to create the system. The researchers also integrated SMS API for the notification and confirmation of payment transactions of the students. They also made sure that the design of the website would be easily understood by their target users.

Testing Phase

In this phase, the researchers conducted some tests to check the functionality of the website. Two tests were made which is the Alpha and Beta tests. The alpha test was conducted by the researchers themselves to check all of the functions of the system. On the other hand, beta test was conducted by the target users to check if the system meet the functions needed for them to have an efficient process of tuition fee assessment and monitoring of payments.

Deployment Phase

In this phase, the system was endorsed to the target users. Here some demonstrations were made so that users would be familiar on how they would use the system. The researchers also provided some tutorials for the step by step procedure for each user type.

Review Phase

The review phase involved reviewing at the end of each sprint to reflect on what went well, what challenges were encountered, and how processes could be improved. Feedback from users and developers was collected to identify enhancements or changes required in subsequent sprints. This continuous improvement loop is a hallmark of Agile, promoting better team performance and a product more aligned with user needs. The researchers used these reviews to refine system features, improve communication, and ensure the project stayed on track toward its objectives.

III. RESULTS AND DISCUSSION**TABLE 1: PROBLEMS ENCOUNTERED BY THE PARENTS, STUDENTS, AND SCHOOL PERSONNEL IN THE PROCESS OF TUITION FEE ASSESSMENT AND MONITORING**

Statement	Yes	No	Rank
1. Tracking outstanding balances manually is confusing and time-consuming.	233	99%	1
2. Payment records are sometimes inaccurate or not updated on time.	189	80%	5
3. Manual assessment and payment confirmation take too long to process.	220	94%	2
4. Lack of notifications often leads to missed payment deadlines.	215	91%	4
5. Lost or misplaced receipts cause payment verification problems.	217	92%	3

Table 1 presents the perceptions of the respondents towards the problems encountered by the parents, students, and school personnel in the process of tuition fee assessment and monitoring. In this table the respondents conducted some interviews to identify the five (5) common problems associated with the tuition fee assessment and monitoring in Lyceum of Southern Luzon Inc. – Balayan Campus.

Out of the total respondents, 233 or 99% agreed that tracking outstanding balances manually is confusing and time-consuming. It was mentioned by the respondents that for the students to check their outstanding balances they need to visit the accounting office personally which is time consuming on the end of the students and the accounting staff. 2 or 1% of the respondents disagreed because they believe that as of the moment since the enrollment is not that huge enough to consider this process as a problem.

Manual assessment and payment confirmation take too long to process that 220 or 94% of the respondents agreed. The reason behind the result is that the accounting office manually assess the student fees individually. There are students that avail discounts which makes their assessment for tuition fees different among others. The remaining 15 or 6% disagreed because some of them enjoys the full tuition fee scholarship from the Balayan LGU which lessens their hassle on the tuition fee assessment.

Majority of the respondents 217 or 92% agreed that lost or misplaced receipts cause payment verification problems. If ever the student misplaced their receipts, they need to personally verify their payments and balances to the accounting office. There are times that they need to fall in line just to verify their payments especially during major exams. 18 or 8% disagreed because for them the process is not that hassle.

In the survey that was conducted 215 or 91% of the respondents agreed that lack of notifications often leads to missed payment deadlines. The current process of payment notifications is done in two different ways. Students are sometimes reminded during classes. In some case the officer in charge is sending payment reminders through group chats. Students sometimes missed these payment reminders resulting to delays in tuition fee payments. 20 or 9% of the respondents disagreed. These students are those who avails scholarship that's why they are not bothered with the payment reminders since their tuition fees are paid in full.

189 or 80% of the respondents agreed that payment records are sometimes inaccurate or not updated on time. There is only one accounting staff that handles the payment transactions of the students. This leads to delays on updating payments of the students. 46 or 20% of the respondents disagreed because they believe that the accounting staff updates the payment of students on time.

TABLE 2: BENEFITS OF THE DEVELOPED SYSTEM FOR THE PARENTS, STUDENTS, AND PERSONNEL OF LYCEUM OF SOUTHERN LUZON – BALAYAN CAMPUS

Statement	Yes	No	Rank	
1. The system provides quick and easy access to tuition fee details and balances.	230	98%	5 2%	2
2. The SMS notification helps students and parents updated on payment deadlines and balances.	233	99%	2 1%	1
3. Online monitoring reduces the need to visit the school for payment concerns.	225	96%	10 4%	3
4. The system promotes transparency in payment transactions.	213	91%	22 9%	5
5. The automation process minimizes human error in computations and records.	217	92%	18 8%	4

Table 2 presents the perceptions of the respondents towards the benefits of the developed system for the parents, students, and personnel of Lyceum of Southern Luzon – Balayan Campus. The researchers identified the key benefits of the developed system for them to be assessed by the target respondents of the study.

233 or 99% of the respondents agreed that The SMS notification helps students and parents updated on payment deadlines and balances. The system can send two types of SMS. The first SMS aims to give payment reminders to the parents and guardians of the students. The second SMS contains the payment reference so that parents can verify the tuition fee payments made by their child. 2 or 1% of the respondents disagreed because experienced delays on the receptions of SMS notification and confirmation.

Majority of the respondents 230 or 98% agreed that the system provides quick and easy access to tuition fee details and balances. Students would just access their accounts for them to check their tuition fee balances. The remaining 5 or 2% disagreed because some they find it hard to use the website because of internet connection problems.

Lost or misplaced receipts cause payment verification problems 225 or 96% of the respondents agreed. If ever the student misplaced their receipts, they need to personally verify their payments and balances to the accounting office. There are

times that they need to fall in line just to verify their payments especially during major exams. 10 or 4% disagreed because for them the process is not that hassle.

The result of the survey shows that 217 or 92% of the respondents agreed that online monitoring reduces the need to visit the school for payment concerns. They just need to access the students account for them to check their tuition fee balances. 18 or 8% of the respondents disagreed. Some payment concerns of the students includes inquiry for promissory notes which is not handled by the system.

In the survey that was conducted 213 or 91% of the respondents agreed that the automation process minimizes human error in computations and records. The system can automatically compute the tuition fees of the students. 22 or 9% of the respondents disagreed because they believe that even if the system can calculate tuition fees, still there is a possibility for error in computations.

TABLE 3: EFFICIENCY - THIS IS THE ABILITY OF THE SYSTEM TO GIVE A MORE EFFICIENT PROCESS IN TERMS OF MONITORING AND UPDATING THE TUITION FEE TRANSACTIONS OF THE STUDENTS

Statement	Yes	No	Rank
1. The system responds to user inputs and maintain operational efficiency.	230 98%	5 2%	2
2. The system efficiently handles concurrent access by at least 100 users during peak enrollment periods without crashing or slowing down significantly.	233 99%	2 1%	1
3. The system performs bulk operations such as mass SMS notifications or report generation in an optimized batch mode to reduce processing time.	225 96%	10 4%	3
4. The system supports efficient multitasking, allowing simultaneous operations (e.g., tuition fee computation and SMS sending) without performance degradation.	213 91%	22 9%	5
5. The system operates without critical errors or crashes during normal use, ensuring uninterrupted access to tuition assessment and monitoring features.	217 92%	18 8%	4

Table 3 presents the assessment using ISO 9126 standards in terms of efficiency. This measures the ability of the system to give a more efficient process in terms of monitoring and updating the tuition fee transactions of the students.

In the survey that was conducted 233 or 99% of the respondents agreed that the system efficiently handles concurrent access by at least 100 users during peak enrollment periods without crashing or slowing down significantly. The respondents tried using the system at the same time and they witnessed that it can work even if multiple users are accessing it. 2 or 1% of the respondents disagreed because of the delays they experienced while using the system.

Majority of the respondents 230 or 98% agreed that the system responds to user inputs and maintain operational efficiency. The system can support multiple users at the same time. The remaining 5 or 2% disagreed because of internet connectivity related concerns.

The result of the survey shows that 225 or 96% of the respondents agreed that the system performs bulk operations such as mass SMS notifications or report generation in an optimized batch mode to reduce processing time. The SMS API integrated to the system can be upgraded depending on the need of the institution. 10 or 4% disagreed because some of them experienced delays when receiving SMS.

217 or 92% of the respondents agreed that the system operates without critical errors or crashes during normal use, ensuring uninterrupted access to tuition assessment and monitoring features. The respondents experienced no delays when using the system. 18 or 8% of the respondents disagreed. Some of the respondents experienced delays during the time they used the system.

The system supports efficient multitasking, allowing simultaneous operations (e.g., tuition fee computation and SMS sending) without performance degradation 213 or 91% of the respondents agreed. The respondents witnessed how hassle free it is when using the system. 22 or 9% of the respondents disagreed because some of them experienced connection interruptions when using the system.

TABLE 4: FUNCTIONALITY - THIS IS THE ABILITY OF THE SYSTEM TO PROVIDE THE FUNCTIONS REQUIRED FOR THE LYCEUM OF SOUTHERN LUZON – BALAYAN TO OFFER REAL-TIME UPDATES FOR THE PARENTS ABOUT THE PAYMENT TRANSACTIONS OF THE STUDENTS.

Statement	Yes Percentage		No Percentage		Rank
1. The system provides an intuitive and user-friendly interface to ensure that administrators, students, and parents easily navigate and perform tasks without extensive training.	233	99%	2	1%	1
2. The system supports access through commonly used web browsers and mobile devices, allowing users to check tuition fees and payment statuses anytime and anywhere.	189	80%	46	20%	5
3. The system remains available and operational during school business hours to ensure continuous access to tuition-related services.	220	94%	15	6%	2
4. The system processes fee computations and displays results to provide a fast and smooth user experience.	215	91%	20	9%	4
5. The system maintains accuracy and consistency of all data inputted and processed, such as payments and fee breakdowns.	217	92%	18	8%	3

Table 4 presents the Assessment using ISO 9126 standards in terms of functionality. This variable describes the ability of the system to provide the functions required for the Lyceum of Southern Luzon – Balayan to offer real-time updates for the parents about the payment transactions of the students.

The result of the survey shows that 233 or 99% of the respondents agreed that the system provides an intuitive and user-friendly interface to ensure that administrators, students, and parents easily navigate and perform tasks without extensive training. The target users tried using the system and they find it easy to do the processes that they are doing manually before. 2 or 1% of the respondents disagreed because they experience delays when they are using the system.

In the survey that was conducted 220 or 94% of the respondents agreed that the system remains available and operational during school business hours to ensure continuous access to tuition-related services. Respondents tried using the website and they witnessed that it can cater their queries associated with tuition fees. The remaining 15 or 6% disagreed they experienced slow response from the website.

217 or 92% of the respondents agreed that the system maintains accuracy and consistency of all data inputted and processed, such as payments and fee breakdowns. The respondents saw that the system can show tuition fee breakdowns depending on the course of the students. 18 or 8% disagreed because some of them are not familiar with the charges on the breakdown of tuition fees.

The system processes fee computations and displays results to provide a fast and smooth user experience 215 or 91% of the respondents agreed. The respondents saw that the tuition fee amount is generated in just few clicks. 20 or 9% of the respondents disagreed. Internet connection happens unexpectedly that's why they are not convinced on the faster transactions provided by the system.

Majority of the respondents 189 or 80% agreed that the system supports access through commonly used web browsers and mobile devices, allowing users to check tuition fees and payment statuses anytime and anywhere. The system runs in majority of the devices available in the market. 46 or 20% of the respondents disagreed because some parents are still using keypad phones that's why they find it hard to use the website.

TABLE 5: RELIABILITY - THIS IS THE ABILITY OF THE SYSTEM TO PROVIDE RELIABLE INFORMATION TO THE USERS WHICH THEY CAN USE AS REFERENCE FOR THEIR TRANSACTIONS

Statement	Yes Percentage		No Percentage		Rank
1. The system responds to user inputs and maintain operational efficiency.	230	98%	5	2%	2
2. The system efficiently handles concurrent access by at least 100 users during peak enrollment periods without crashing or slowing down significantly.	235	100%	0	0%	1

3. The system performs bulk operations such as mass SMS notifications or report generation in an optimized batch mode to reduce processing time.	225	96%	10	4%	3
4. The system supports efficient multitasking, allowing simultaneous operations (e.g., tuition fee computation and SMS sending) without performance degradation.	213	91%	22	9%	5
5. The system operates without critical errors or crashes during normal use, ensuring uninterrupted access to tuition assessment and monitoring features.	217	92%	18	8%	4

Table 5 presents the assessment using ISO 9126 standards in terms of reliability. This measures the ability of the system to provide reliable information to the users which they can use as reference for their transactions

All of the respondents agreed that the system detects and prevents duplicate payment entries during user submission or admin input. The system does not allow the accounting staff to process another payment for the same period.

Majority of the respondents 230 or 98% agreed that the system ensures that each financial transaction is completed in full or not at all, to prevent partial or incorrect records. The system can show if the payment is settled already or still pending. The remaining 5 or 2% disagreed because the system didn't respond timely when they used it.

225 or 96% of the respondents agreed that the system maintains consistent data across all modules and user views, even under high load. The respondents checked if their accounts show similar transactions in different devices. 10 or 4% disagreed because some of them didn't get the chance to check their accounts on other devices.

In the survey that was conducted 217 or 92% of the respondents agreed that the system checks and validates all user input to reduce the risk of errors and incorrect data entries. The developers of the website ensured that all fields are supplied with the required information before saving it to the database. 18 or 8% of the respondents disagreed. Some of the respondents are not aware with the fields that requires specific information that's why they find it hard to save their data.

The survey result shows that 213 or 91% of the respondents agreed that the system ensures stable user sessions that do not randomly expire or disconnect during active use. The system ensures active usage as long as the users maintain a stable internet connection. 22 or 9% of the respondents disagreed because some of them don't have stable internet connection.

IV. CONCLUSION

Upon completing the study and the development of the website, the researchers concluded the following: 1. Tracking outstanding balances manually is confusing and time-consuming; 2. The SMS notification helps students and parents updated on payment deadlines and balances.; 3. In terms of efficiency, the system efficiently handles concurrent access by at least 100 users during peak enrollment periods without crashing or slowing down significantly. In terms of functionality, the system provides an intuitive and user-friendly interface to ensure that administrators, students, and parents easily navigate and perform tasks without extensive training. When it comes to reliability, the system efficiently handles concurrent access by at least 100 users during peak enrollment periods without crashing or slowing down significantly

REFERENCES

- [1] Al-Hassan, S., and Ndzingo, S. (2021). Financial management in educational institutions: Challenges and technological solutions. *International Journal of Educational Technology*, 7(2), 45-59.
- [2] Sharma, P., and Gupta, R. (2021). The impact of mobile notifications on student financial behavior: A case study on SMS-based alerts. *International Journal of Financial Education*, 5(4), 112-128.
- [3] Singh, A., and Sharma, P. (2021). *IT systems administration and management*. McGraw-Hill.
- [4] Richards, M., and Amundsen, M. (2021). *API design patterns and best practices*. O'Reilly Media.
- [5] McFarland, D. (2022). *CSS: The missing manual (5th ed.)*. O'Reilly Media.
- [6] Elmasri, R., and Navathe, S. (2021). *Fundamentals of database systems (7th ed.)*. Pearson.
- [7] Freeman, E. (2021). *Head first HTML and CSS (3rd ed.)*. O'Reilly Media.
- [8] Parker, J. (2023). *Mastering MySQL: A guide to relational databases*. Addison-Wesley.

- [9] Ullman, L. (2022). PHP and MySQL for dynamic web sites: Visual quickpro guide (6th ed.). Peachpit Press.
- [10] Andrews, M. (2021). Mobile communication systems: SMS and beyond. Springer.
- [11] Sommerville, I. (2021). Software engineering (10th ed.). Pearson.
- [12] Wouldiams, T. (2023). Building modern websites: A comprehensive guide. Wiley.
- [13] Lopez, R., and Cruz, M. (2022). Digital transformation in tuition management: A case study in higher education. *Journal of Educational Finance*, 25(2), 134-150.
- [14] Chandra, R., and Patel, S. (2021). User-centered design in educational financial systems: Improving usability and accessibility. *International Journal of Educational Technology*, 36(4), 215-229.
- [15] Smith, J., and Brown, K. (2021). Database management for educational institutions: Best practices and case studies. *Academic Computing Review*, 14(3), 112-130.
- [16] Miller, D., and White, P. (2021). PHP in dynamic web applications: A practical approach. *Web Development Journal*, 19(3), 67-81.
- [17] Wouldiams, L. (2024). The impact of SMS notifications on tuition fee compliance: A study in higher education institutions. *Educational Finance Review*, 22(1), 56-73.
- [18] Jones, M. (2021). Cybersecurity in financial management systems: Protecting sensitive data in education. *Journal of Information Security*, 18(2), 87-102.
- [19] Chen, M., Liu, R., and Zhang, W. (2021). Web-based payment systems in higher education: Challenges and solutions. *International Journal of Financial Technology*, 8(1), 78-94.
- [20] Singh, A., and Patel, K. (2021). The role of database management in educational systems. *Journal of Information Systems in Education*, 15(2), 112-126.
- [21] Garcia, P., Martinez, S., and Rivera, L. (2024). SMS notifications and their impact on academic administration. *Journal of Educational Communication*, 14(2), 33-47.
- [22] Johnson, B. (2021). Web-based tuition monitoring systems: Enhancing financial tracking. *Journal of Higher Education Finance*, 6(2), 45-60.
- [23] Brown, J., and Wilson, T. (2021). Enhancing web usability with CSS in educational applications. *Journal of Web Development and Design*, 12(3), 45-60.
- [24] Rodriguez, F., and Santos, G. (2021). Effectiveness of automated tuition assessment in higher education. *Education Finance Review*, 19(1), 55-71.
- [25] Smith, A., and Allen, J. (2021). Student financial management systems and self-service portals. *Journal of Financial Education Technology*, 15(1), 34-50.
- [26] Lee, C., and Gomez, H. (2021). The role of automation in tuition fee processing. *Education Financial Review*, 14(3), 56-71.
- [27] Jones, P., Carter, L., and Wilson, R. (2024). The impact of SMS tuition reminders on student payment compliance. *Journal of Educational Communication*, 13(1), 88-102.
- [28] Davis, K., and Richardson, T. (2023). Online payment gateway integration in tuition management systems. *Journal of Financial Technology*, 11(3), 78-92.
- [29] Wang, L., and Roberts, M. (2021). Mobile applications for tuition fee management: Improving student engagement. *Journal of Digital Education Systems*, 8(2), 99-115.
- [30] Parker, D., and Lewis, G. (2021). University billing and payment systems: An integrated approach. *International Journal of Institutional Finance*, 7(2), 112-128.
- [31] <https://indevlab.com/blog/what-is-agile-development/>