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# Student ID Validation Monitoring System

Aira Mae F. Muelan<sup>1</sup>, Kyla Marie G. Decomotan<sup>2</sup>, Jerico N. Lebuna<sup>3</sup>

<sup>1</sup>Aira Mae F. Muelan, Brgy. Igpuro, Miagao, Iloilo, Philippines

<sup>2</sup> Kyla Marie G. Decomotan, Brgy. Parara Sur, Tigbauan, Iloilo, Philippines

<sup>3</sup> Jerico N. Lebuna, Brgy. Maninila, Miagao, Iloilo, Philippines

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## \*Correspondence Email:

[airamaemuelan58@gmail.com](mailto:airamaemuelan58@gmail.com)

## Abstract

The Student ID Validation Monitoring System (SIVMS) is a web-based system aimed to monitor students' ID validation status at Iloilo Science and Technology University Miagao Campus. This system was created to address the challenge faced by the Office of Student Affairs and Services Miagao Campus in ensuring only students with validated ID are in the campus, enhancing safety, and security. By utilizing QR code scanning technology, the system ensures quick and accurate tracking of student validation status. The main objective of the study was to develop a system that manages student profiles, generates unique QR codes for each student, and enables security personnel to monitor student ID validation status. The system also has the ability to generate reports and was evaluated using the ISO 25010 software quality model. Built with HTML, CSS, PHP, and MySQL, the system followed the Iterative Software Development Methodology, ensuring continuous improvements through user feedback. The evaluation results, based on the ISO/IEC 25010 criteria, showed an overall rating of "excellent," with a mean score of 4.52. The system met the standards for functional suitability, performance efficiency, compatibility, usability, reliability, security, maintainability, and portability. In conclusion, the study successfully achieved its goal of developing the SIVMS, improving campus security, and supporting university policy enforcement.

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## 1. Introduction

Iloilo Science and Technology University - Miagao Campus is committed to providing quality education and implementing student welfare and development programs. The Office of Student Affairs and Services (OSAS) mandates that students validate their identification cards each semester and wear them inside the school premises. However, there are still some students who do not have their IDs validated. The current setup is ineffective, as only 66% of the population has their IDs validated. To improve security measures and streamline monitoring, the researchers developed a Student ID Validation Monitoring System that scans ID validation status through QR codes, manages student profiles, generates quick response codes, and generates reports.

## 1.1 Literature Review

This chapter provides an idea of how these studies are related to the present research. Theoretical and technical definitions related to this study are further discussed to promote understanding and cycle of what a Student ID Validation Monitoring System entails.

A foreign study by Khatri et al. (2023), entitled “QR Code Based Access Control System,” is designed to allow access to authorized users and restrict access to unauthorized users. QR code-based access control systems are increasingly becoming popular due to their ease of use, convenience, and security. The implementation of an efficient and secure access control system is crucial in any organization. The traditional methods of using physical keys or swipe cards are becoming obsolete and unreliable, leaving organizations in need of a more advanced solution. This is where the QR code-based access control system comes into play. It is an innovative technology that enables an organization to grant access to specific areas based on a QR code generated for each individual. The QR code contains information about the individual’s identity and the level of access they are entitled to. Access to specific areas can be granted or denied based on the QR code scan. The implementation of the QR code-based access control system is a straightforward process that requires minimal infrastructure and maintenance. The system requires the installation of QR code scanning devices at the entry points of specific areas. Once the QR code has been scanned, the system will automatically grant or deny access based on the information stored in the code. The QR code-based access control system offers numerous benefits for companies. The system provides real-time monitoring and reporting of the access control activities, which helps to enhance the overall security of the organization. The QR code-based access control system eliminates the need for physical keys or swipe cards, which can be lost or stolen.

The study entitled "An Automated University Gate Pass Monitoring System Using Deep Learning" by Patel Meghavi Kiritbhai and Jyotsna C (2021), identifies the problem of effectively monitoring student exits from the campus, as traditional methods often lack real-time accuracy and efficiency. This can lead to security vulnerabilities and difficulty in tracking student movements. To address this issue, the authors propose an automated gate pass system that utilizes face recognition technology to process live video feeds from surveillance cameras. This system accurately identifies students by comparing their faces with stored images, automatically logging their exits, and sending notifications. By implementing this solution, the study aims to enhance campus security, streamline student tracking, and improve operational efficiency through a user-friendly graphical interface.

## 2. Research Methods

The Iterative Software Development Methodology was a software development approach where developers design and code a part of the software without a full product specification. This method allows for quick bug fixes, reduces documentation time, and allows developers to focus on actual project work. The modular nature of the development process makes it easy to adjust (Vardomatski, 2019)

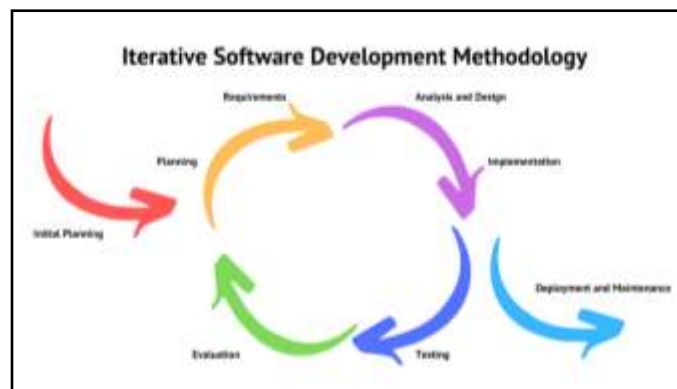


Fig. 1 Iterative Software Development Methodology (Vardomatski, 2019)

## Initial Planning

Researchers observed that most students don't validate their IDs during the current semester. They planned to create a Student ID Validation Monitoring System, brainstorming requirements, objectives, scope, and limitations. They also analyzed the current manual system and identified issues.

## Planning

Researchers refined a plan for a Student ID Validation Monitoring System based on interviews with the Office of Student Affairs and Services (OSAS), collaborating with Dr. Myla N. Conejar to identify necessary inputs and processes.

## Requirements

In this phase, the researchers identified the requirements of OSAS, including who would use the system and how it would be utilized. The users of the system, including OSAS staff and the guards on duty for security measures, were specified. The process also involved understanding how students validated their IDs with the current system.

## Analysis & Design

Researchers analyzed the system's functionality through diagrams, flowcharts, network architecture, database structure, and user interface. They implemented design specifications using programming language and tested each feature's functionality.

## Implementation

In this phase, the team wrote the program code for the system, developing features such as student ID validation and QR code functionality. The programmer code the system using Php and MySQL as backend, and HTML and CSS for frontend. The system was assembled and tested to ensure that each part worked as intended and integrated properly.

## Testing

Researchers conducted extensive testing on a system to ensure it met user needs, including student ID validation, QR code generation, and report generation. They reviewed design accuracy, fixed bugs, and conducted live mock testing in a guard house to ensure smooth operation and accuracy.

## Evaluation

In this phase, researchers evaluated the results of the testing by gathering feedback from users and analyzing the system's performance, and determined what improvements were needed based on this feedback, identifying any issues or areas for enhancement to ensure the system met user requirements effectively. The ISO 25010 software evaluation criteria were used to assess the system during this phase. To achieve this, a Likert Scale Rating was administered to ten (10) IT experts and five (5) potential End users from the Office of the Student Affairs and Services, who provided their professional assessment of the system's performance.

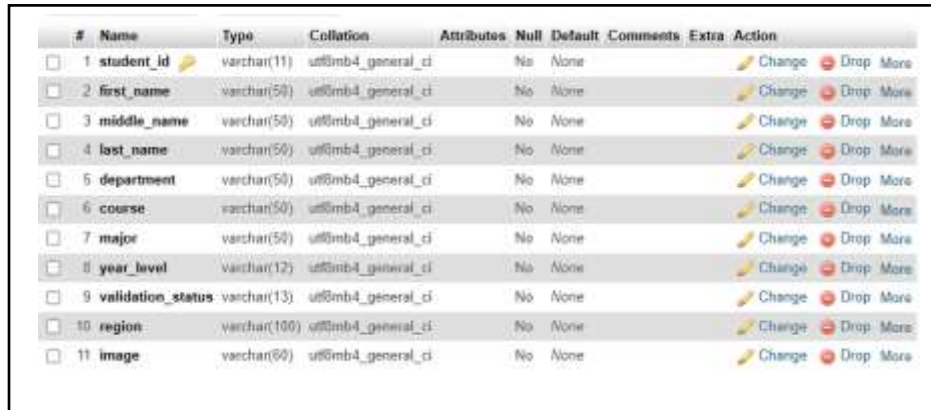
## Deployment and Maintenance

In this phase, the researchers improved the Student ID Validation Monitoring System by enhancing features based on user feedback. Researchers added new options and refined the user interface for better usability. The team also optimized the existing code to ensure smooth operation and conducted ongoing testing to quickly address any issues.

### 3. Result and Discussion

#### A. Create Database to Store Student Profile

The system's first goal was to establish a database that could securely store all relevant student information. This database was designed to hold essential fields such as student ID number, first name, middle name, last name, address, course and year, academic year, validation status, and ID photo.



#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
<input type="checkbox"/>	1 student_id	varchar(11)	utf8mb4_general_ci		No	None			Change  Drop  More
<input type="checkbox"/>	2 first_name	varchar(50)	utf8mb4_general_ci		No	None			Change  Drop  More
<input type="checkbox"/>	3 middle_name	varchar(50)	utf8mb4_general_ci		No	None			Change  Drop  More
<input type="checkbox"/>	4 last_name	varchar(50)	utf8mb4_general_ci		No	None			Change  Drop  More
<input type="checkbox"/>	5 department	varchar(50)	utf8mb4_general_ci		No	None			Change  Drop  More
<input type="checkbox"/>	6 course	varchar(50)	utf8mb4_general_ci		No	None			Change  Drop  More
<input type="checkbox"/>	7 major	varchar(50)	utf8mb4_general_ci		No	None			Change  Drop  More
<input type="checkbox"/>	8 year_level	varchar(12)	utf8mb4_general_ci		No	None			Change  Drop  More
<input type="checkbox"/>	9 validation_status	varchar(13)	utf8mb4_general_ci		No	None			Change  Drop  More
<input type="checkbox"/>	10 region	varchar(100)	utf8mb4_general_ci		No	None			Change  Drop  More
<input type="checkbox"/>	11 image	varchar(60)	utf8mb4_general_ci		No	None			Change  Drop  More

Fig. 2 Database to store student profile

The student table is designed to store student information in an organized and efficient way. Each student is identified by a unique student\_id to prevent duplicate records. It includes basic personal details like first name, middle name, and last name for clear identification. Academic information such as department, course, and major helps categorize students based on their field of study. The year\_level field is used to determine the student's current year level, such as 1st year, 2nd year, and so on. The validation\_status field monitors whether the student's ID is approved for campus access. The region field stores the student's address for location-based analysis. Finally, the image field links to the student's profile picture for visual identity verification.

#### B. Manage Student Profile

Administrator or the OSAS can manage student profile such as adding student.



The screenshot shows a web interface for adding a student. On the left is a sidebar menu with options: DASHBOARD, ADD STUDENT (highlighted), VIEW VIOLATORS, VIEW STUDENTS, GENERATE QR, and SCAN QR CODES. The main content area is titled 'ADD STUDENT' and contains the following fields:

- Student ID:
- First Name:
- Middle Name:
- Last Name:
- Academic Year:
- Department:
- Course:
- Year Level:
- Gender:
- Address:
- Validation Status:  Yes  No
- Student Photo:

A blue 'Submit' button is located at the bottom right of the form.

Fig. 3 Add Student Data

To add student, the administrator must fill out the necessary field with corresponding information needed such as their Student ID, First Name, Middle Name, Last Name, Department, Course, Year Level, Address, and Student Photo as shown in Figure 2.

Administrator or the OSAS can manage student profile such as viewing student information.

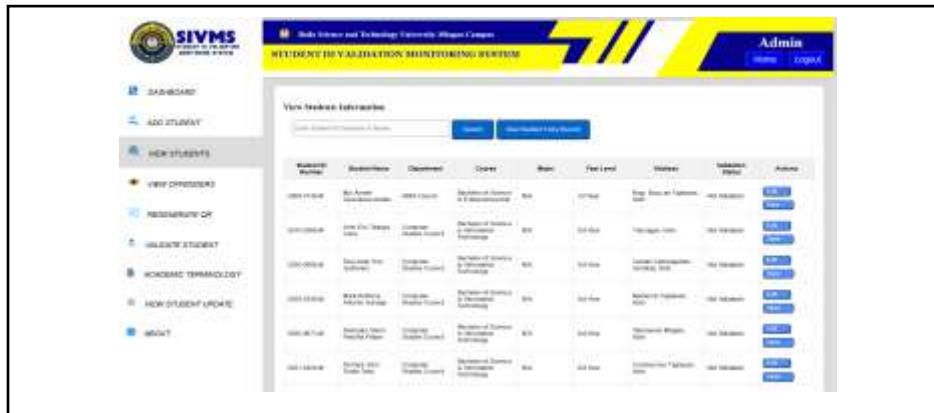


Fig. 4 View Students

To view student, the administrator can see all student's data. To edit, or view their offenses, the administrator can search for student's ID number. The administrator can edit student's data. The administrator can also view student's record.

Administrator or the OSAS can manage student profile such as view student offenders by offense count, department, and year level.



Fig. 5 View Student Record

### C. Generate QR Code

Administrator or the OSAS can generate QR Code for student's ID. If the admin submitted the "add student" data form, it will then direct to generation of QR Code.



Fig. 6 Generate QR Code

Once the admin submits the "add student" data form, the system automatically generates a unique QR code for the student. This ensures that each student receives a personalized QR code embedded their student ID number, which is essential for tracking their ID validation status.

### D. Create Interface for Security Guard to scan QR Code



Fig. 7 Security Guard Interface

This is an interface for security guard that demonstrate a clear and informative display of relevant student information, allowing security guard to easily verify the student's validation status at a glance. The system fulfills its role of showing the student profile, validation status, and other necessary details efficiently.

E. Generate Report

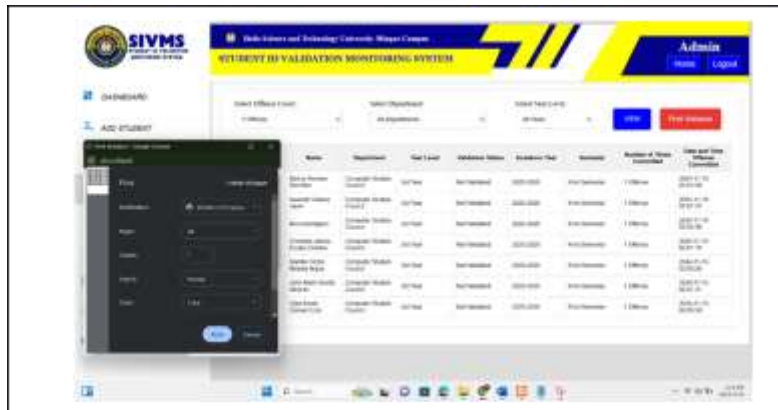


Fig. 8 Generate Report

F. Evaluate using ISO 25010

The ISO 25010 criteria for software evaluation was adopted to evaluate the system. Ten (10) IT Experts and Five (5) End Users from the Office of Student Affairs and Services were identified to evaluate the system using Likert Scale Rating shown below:

Table 1. Result for Evaluation of IT Experts based on ISO/IEC 25010

Characteristics	N	Mean	Description
Functional Suitability	10	4.50	Excellent
Performance Efficiency	10	4.60	Excellent
Compatibility	10	4.45	Very Satisfactory
Usability	10	4.55	Excellent
Reliability	10	4.40	Very Satisfactory
Security	10	4.46	Very Satisfactory
Maintainability	10	4.45	Very Satisfactory
Portability	10	4.57	Excellent
Overall Result	10	4.50	Excellent

The system was evaluated by ten IT experts based on eight criteria: functional suitability, performance efficiency, compatibility, usability, reliability, security, maintainability, and portability. The system was rated "excellent" by the experts, indicating its high quality and effectiveness in achieving user goals, complied with ISO criteria.

Table 2. Result using ISO/IEC 25010 Evaluated by Five (5) End Users

Variables	N	Mean	Description
Functional Suitability	5	4.67	Excellent
Usability	5	4.76	Excellent
Maintainability	5	4.45	Very Satisfactory
Portability	5	4.53	Excellent
Overall Result	5	4.60	Excellent

Functional suitability, usability, maintainability, portability are the four factors used as the basis for the potential user's evaluation of the system. The evaluation result was "excellent," as indicated in Table 5 with an average mean of 4.60. The mean values for each factor are as follows: Mean of 4.67 in functional suitability, mean of 4.76 in usability, mean of 4.45 in maintainability, and mean of 4.53, in portability. The outcomes demonstrated that the system meets ISO requirements and that it had received an "Excellent" rating from the respondents. This indicates that the system software was of high standard and efficient in achieving the users' objectives.

#### 4. Conclusions

Based on the findings, the development of the Student ID Validation Monitoring System (SIVMS) successfully addresses the challenges of managing student ID validation at Iloilo Science and Technology University - Miagao Campus. The system streamlines the process through the use of QR codes, enabling quick and secure validation of student IDs. The Iterative Software Development Methodology allows for continuous improvements based on feedback, ensuring that the system meets the specific needs of the Office of Student Affairs and Services (OSAS) and campus security.

Based on the evaluation of the IT experts, the overall mean has a rating of 4.50. The end users have an overall mean of 4.60, which indicates that the system is excellent.

As to the results of the study, the system improves campus security by making sure only validated students can enter the campus. The system makes the ID validation process faster and more accurate. It also helps administrators track violations, generate reports, and manage student IDs more easily. Overall, the system meets the university's security and operational goals, creating a safer, more regulated campus environment.

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