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E-Visitor Logbook System: An Enhanced Logbook Annotation System with Face Capture Functionality

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Abstract

This research presents and focuses on the design and implementation of the MCC E-Visitor Logbook System: An Enhanced Logbook Annotation System with Face Capture Functionality, a web-based development to improve monitoring visitors and campus security at Madridejos Community College. An established paper logbook usually results in incomplete records, delayed processing, and poor data organization. To address these concerns, the system consolidates facial image captures, QR code based time-in and time-out logging CRUD functionalities for staff and visitors, automated report generation, real time dashboard visualization, and secure user authentication. The development followed the Agile Software Development Life Cycle, covering requirement analysis, system design, development, testing and deployment. Evaluation was implemented by three IT professionals using the ISO 25010 Software Quality Model and the use questionnaire. Research outcome revealed excellent performance in visitor management and reporting. However, dashboard features, QR processing, and security functions showed moderate effectiveness. User's feedback confirmed the system's usability and reliability, supporting its adoption as a modern alternative to manual logbooks.

Keywords: *Visitor Management System, Facial Capture, Digital Logbook, Campus Safety, Agile Methodology, ISO 25010, USE Survey, QR-Based Monitoring*

1. Introduction

Schools today increasingly recognize the need to strengthen campus security, especially in monitoring visitors, yet Madridejos Community College (MCC) still relies on a

traditional manual logbook that often results in unreadable handwriting, lost pages, and inconsistent records. Because of these limitations, many institutions are shifting to digital solutions such as an E-Visitor Logbook System: An Enhanced Logbook Annotation System with Face Capture Functionality, which integrates facial recognition with digital logging to provide a more secure, organized, and real-time method of tracking visitors [1]. This system captures a visitor's photo along with essential details like name, purpose of visit, and time of entry, reducing errors from manual writing, preventing missing information, and enabling administrators to quickly identify individuals on campus during emergencies [2]. The use of automated visitor systems has also been shown to improve monitoring and control access within institutions [3]. The contactless process further supports health and safety protocols emphasized during the COVID-19 pandemic [4]. Studies have also highlighted the importance of digital visitor systems in maintaining hygiene and minimizing physical contact during check-in procedures [5]. For MCC, adopting this system can significantly enhance campus security and operational efficiency by speeding up check-in and check-out processes and improving record accuracy [6]. Research shows that institutions using biometric visitor systems can achieve up to a 40% reduction in unauthorized access incidents [7]. As a growing educational institution in Cebu, MCC stands to benefit from this modern, cloud-based, and secure approach, which supports its transition toward a more efficient, technology-driven campus environment.

1.1 Objectives of the study

This project aims to create an E-Visitor Logbook System: An Enhanced Logbook Annotation System with Face Capture Functionality.

1. Provide options to create, read, update, and delete:
    a. Staff records
    b. Visitors
2. Generate reports of total visitors and staff records.
3. Provide QR codes for easier Log-in and Log-outs of the visitors.
4. Being accessible online.
5. To evaluate the usability, efficiency, and user satisfaction of the Madridejos Community College E-visitor Logbook with face capture system using the USEE (Usability, Satisfaction, questionnaire. Efficiency, and Effectiveness)
6. To determine the system's quality characteristics based on the ISO 25010 software and system quality model, 4 focusing on performance, reliability, flexibility, safety, and maintainability to ensure optimal functionality and user trust.

2. Methods

The developmental research methodology is used in this research study entitled E-Visitor Logbook System: An Enhanced Logbook Annotation System with Face Capture Functionality. It has been described as the systematic study of designing, developing, and evaluating instructional program processes to ensure internal consistency and effectiveness [8]. This approach is commonly applied in the development of automated gate pass and visitor management systems in organizations [9]. It is also used in modern studies involving biometric and technology-based security systems to improve institutional monitoring and control [10].

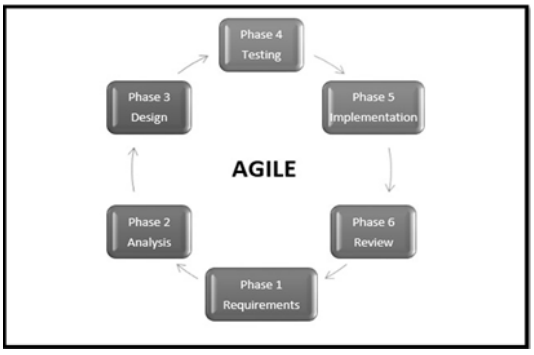

Fig. 1 Agile Development Method

Phase 1: Requirement Phase

The Software requirements for developing and implementing a E-Visitor Logbook System: An

Enhanced Logbook Annotation System with Face Capture Functionality are listed below:

- Windows 10 operating system
- XAMPP
- Google Chrome as a browser for better compatibility
- Bootstrap
- Laravel

Phase 2: Analysis Phase

During this phase, the project team performed a detailed assessment of several key aspects, including data requirements, UI/UX design, data security, data storage and management, forms, data reports, and documentation.

1. Data Requirements: The researchers carefully reviewed the beneficiary's forms, policies, and constraints to ensure data precision and adherence to existing standards.
2. UI/UX Design: The researchers customized the color palette to reflect the features of the E-Visitor logbook system, prioritizing responsive design for optimal display across different screen sizes. It also focused on enhancing user navigation in alignment with Web Content Accessibility Guidelines (WCAG).
3. Data Security: Various security algorithms were evaluated to identify the most effective strategies for safeguarding data and ensuring strong protection.
4. Data Management: The researchers examined the current network infrastructure to confirm that the solution would be accessible and scalable within the existing
5. Data Reports: In collaboration with the beneficiary, the researchers identified the most relevant reports to feature on the main dashboard.
6. Documentation: The researchers reviewed and refined the system's documentation format to ensure it was clear and thorough with user manual survey questions.

Phase 3: Design Phase

During the design phase, the researchers visualized the flow of data with data monitoring the Entity Relationship Diagram (ERD), Data flow diagram, Use-case diagram, Context flow diagram, and Application Architecture within the E-Visitor Logbook System: An Enhanced Logbook Annotation System with Face Capture Functionality: An Innovative Solution for Manual Visitor Logbook. To refine the user interface, they developed wireframes and prototypes, which researchers were then presented to stakeholders for approval. These prototypes featured a responsive design optimized for web platforms, ensuring consistent usability across devices. Feedback I gathered during this phase influenced the selection of suitable programming languages and frameworks, with PHP and JavaScript chosen for their robustness and compatibility with the system's architecture. The system was built on a client-server architecture, ensuring scalability and efficient performance. This design included workstations optimized for handling simultaneous transactions in real-time. Additionally, data analytics techniques were integrated, with visualizations such as line graphs included in the dashboard for real-time performance tracking. And the final system design was documented thoroughly.

Phase 4: Testing Phase

In the development phase, the team begins by assigning technical tasks based on the user stories planned for the sprint. Developers write code following coding standards and best practices, ensuring it is modular, reusable, and easy to test. Optional pair programming may be used for complex features or mentoring. All code is managed using a version control system like Git, with branches and pull requests to track changes. Developers also write unit tests to ensure individual components work as intended. Daily stand-up meetings are held to monitor progress and address blockers. The goal of this phase is to produce a functional increment of the software with test coverage and proper documentation.

Phase 5: Implementation Phase

During the implementation phase, the team performs integration testing to ensure different modules work together seamlessly. User acceptance testing (UAT) is conducted with stakeholders or the product owner to validate that

the developed features meet the requirements. Any bugs or issues found are addressed promptly. The application is then deployed to a staging environment using automated CI/CD pipelines. After final validation, the team prepares release notes and deploys the application to production, typically during scheduled release windows. A rollback plan is also prepared in case issues arise during deployment. The main output of this phase is a working, production-ready version of the software.

Phase 6: Review Phase

In the review phase, the team conducts a sprint retrospective to reflect on what went well, what could be improved, and what actions to take in the next sprint. Feedback is also gathered from stakeholders and users to evaluate how the delivered product performs in a real-world environment. The team updates and prioritizes the product backlog based on this feedback. Metrics such as sprint velocity, defect rates, and test coverage are analyzed to identify areas of improvement. Finally, the team documents lessons learned and shares knowledge to enhance future development cycles. This phase helps the team continuously improve and adapt to better productivity and quality.

3. Results

Table 1. In terms of functionality of CRUD (Create, Read, Update, Delete) operations to manage staff

Functionality of CRUD operations - Manage staff	Mean	Verbal Interpretation
How functional is the system in allowing the admin to create staff records?	**5.00**	Excellent
How functional is the system in allowing the admin to read staff information?	**5.00**	Excellent
How functional is the system in allowing the admin to update staff details?	**5.00**	Excellent
How functional is the system in allowing the admin to delete staff records?	**5.00**	Excellent
Average	**5.00**	**Excellent**

Table 1. In terms of functionality of CRUD (Create, Read, Update, Delete) operations to manage staff. The table above shows the result of the three I.T. experts' feedback in testing our system in terms of implementing CRUD (Create, Read, Update, Delete) operations to manage staff, the lowest score is 5 while the highest score is 5, it was rated with a mean value of 5, which is interpreted as excellent.

Table 2. In terms of functionality of CRUD operations to manage visitors.

Functionality of CRUD operations to manage visitors	Mean	Verbal Interpretation
How functional is the system in allowing the admin to create visitor records?	**5.00**	Excellent
How functional is the system in allowing the admin to read visitor information?	**5.00**	Excellent
How functional is the system in allowing the admin to update staff details?	**4.67**	Moderately Functional
How functional is the system in allowing the admin to delete staff records?	**5.00**	Excellent
Average	**4.92**	**Moderately Functional**

The table above shows the result of the three I.T. experts' feedback in testing our system in terms of functionality CRUD operations for the admin to manage visitors, the lowest score is 4.67 while the highest score is 5 it was rated with a mean value of 4.92, which is interpreted moderately functional.

Table 3. In terms of providing an intuitive admin dashboard display for the functionality of the admin panel.

Functionality of the Admin Panel	Mean	Verbal Interpretation
How functional is the admin panel in displaying total visitor information?	**5.00**	**Excellent**
How functional is the admin panel in showing staff updates?	**5.00**	**Excellent**
How functional is the admin panel in showing weekly visitor updates?	**5.00**	**Excellent**
How functional is the admin panel in showing monthly visitor updates?	**5.00**	**Excellent**
How functional is the admin panel in providing the visitor statistic?	**4.67**	**Moderately Functional**
How functional is the admin panel in showing the total visitor and staff?	**4.67**	**Moderately Functional**
Average	**4.89**	**Moderately Functional**

The table above shows the result of the three I.T. experts' feedback in testing our system in terms of providing an intuitive admin dashboard display for the functionality of the admin panel, the lowest score is 4.67 while the highest score is 5, it was rated with a mean value of 5, which is interpreted as excellent.

Table 4. In terms of functionality of the admin side

Functionality of the Admin Side	Mean	Verbal Interpretation
How functional is the system displaying the dashboard?	**5.00**	**Excellent**
How functional is the system in showing the managed staff records?	**5.00**	**Excellent**
How functional is the system in showing the managed visitor records?	**5.00**	**Excellent**
How functional is the system in viewing reports?	**5.00**	**Excellent**
How functional is the system in displaying	**4.00**	**Moderately Functional**

user activity logs?		
Average	**4.80**	**Moderately Functional**

The table above shows the result of the three I.T. experts' feedback in testing our system but one expert gave us 3 ratings for displaying user activity logs which leads to the result of 3.67 because expert 2 say it doesn't record activities properly and needs improvement, the final result of functionality in displaying user activity logs the programmer enhance the activity logs details to improve the functionality of displaying user activity logs, in terms of providing an intuitive admin dashboard display for the functionality of the admin side, the lowest score is 4 while the highest score is 5, it was rated with a mean value of 4.8, which is interpreted as moderately functional.

Table 5. In terms of functionality of the QR code generation and scanning for time-in and time-out of visitor

Functionality of the QR Code Ti me-In and Time-Out	Mean	Verbal Interpretation
How functional is the system in generating QR codes?	**4.33**	**Moderately Functional**
How functional is the scanning to specify the visitors?	**4.67**	**Moderately Functional**
How functional is the system in generating QR codes for time-out?	**4.67**	**Moderately Functional**
How functional is the QR code scanning feature in visitors to time-out?	**5.00**	**Moderately Functional**
Average	**4.67**	**Moderately Functional**

The table above shows the result of the three I.T. experts' feedback in testing our system in terms of QR code generation and scanning for time-in and time-out of visitors, the lowest score is 4.33 while the highest score is 5 it was rated with a mean value of 4.67, which is interpreted as moderately functional.

Table 6. In terms of functionality of online managing visitor, visitor information, user roles and permissions.

Functionality of online managing visitor, information, roles, and permissions	Mean	Verbal Interpretation
How functional is the system in managing visitor records online?	**4.67**	**Moderately Functional**
How functional is the system in storing complete visitor information?	**4.67**	**Moderately Functional**
How functional is the system in assigning roles to users or administrators?	**4.67**	**Moderately Functional**
How functional is the system in assigning specific access permissions to users?	**4.67**	**Moderately Functional**
Average	**4.67**	**Moderately Functional**

The table above shows the result of the three I.T. experts' feedback in testing our system in terms of online managing visitor, visitor information, user roles and permissions, the lowest score is 4.67 while the highest score is 4.67, it was rated with a mean value of 4.67, which is interpreted as moderately functional.

Table 7. In terms of functionality of the secure user verification during login.

Functionality of the Login and Authentication feature	Mean	Verbal Interpretation
How functional is the login system in verifying user credentials?	**4.67**	**Moderately Functional**
How functional is the system in implementing Two-Factor Authentication?	**4.33**	**Moderately Functional**
How functional is the system in validating login input fields to prevent errors?	**4.67**	**Moderately Functional**
How functional is the system in preventing SQL injection attacks?	**4.67**	**Moderately Functional**
Average	**4.59**	**Moderately Functional**

The table above shows the result of the three I.T. experts' feedback in testing our system in terms of functionality of the secure user verification during login, the lowest score is 4.33 while the highest score is 4.67, it was rated with a mean value of 4.59, which is interpreted as moderately functional.

Table 8. In terms of usefulness, satisfaction, and ease of use and learning.

Criteria	Mean	Verbal Interpretation
Usefulness	**4.42**	**Agree**
Ease of use	**4.42**	**Agree**
Ease of Learning	**4.42**	**Agree**
Satisfaction	**4.86**	**Agree**
Average	**4.53**	**Agree**

In terms of usefulness, it was rated with a mean value of 4.42. With regards to ease of use, it was rated with a mean value of 4.42. Regarding ease of learning, it was rated with a mean value of 4.42. With regards to satisfaction, it was rated with a mean value of 4.86, and the total average is 4.53. All of the USE questionnaires are interpreted as agree.

Table 9. In terms of characteristics set in ISO 25010 Software Quality Model

Criteria	Mean	Verbal Interpretation
Functional Sustainability	**4.55**	**Slightly Satisfied**
Performance efficiency	**4.33**	**Slightly Satisfied**
Compatibility	**4.71**	**Slightly Satisfied**
Reliability	**4.42**	**Slightly Satisfied**
Security	**4.42**	**Slightly Satisfied**
Average	**4.49**	**Slightly Satisfied**

Regarding functional suitability, it was rated with a mean value of 4.55. About the performance efficiency, it was rated with a mean

value of 4.33. Regarding compatibility, it was rated with a mean value of 4.71. With regards to reliability, it was rated with a mean value of 4.42. Regarding security, it was rated with a mean value of 4.67, and all of the characteristics of the software are interpreted as slightly satisfied.

4. Discussions

The following interpretation is based on proper demonstration, discussion, understanding, and research data analysis.

1. In terms of CRUD functionality for managing staff records, the results presented in Table 1 demonstrate that the system performed exceptionally well. Based on the evaluation conducted by three I.T. experts, all criteria consistently received a rating of 5, which is the highest possible score. This yielded a mean score of 5.00, interpreted as "Excellent." These findings suggest that the system is highly effective and reliable in handling staff record management tasks, meeting the expected standards for functionality and performance.
2. In terms of CRUD functionality for administrators in managing visitors, the table above presents the evaluation results from three I.T. experts. The ratings ranged from a lowest score of 4.67 to a highest score of 5.00, resulting in a mean value of 4.92. This mean score is interpreted as "Moderately Functional." The findings indicate that the system performs well in executing essential operations, though there may still be opportunities for further improvement to enhance its overall functionality.
3. In terms of providing an intuitive admin dashboard display for the functionality of the admin panel, the table above presents the evaluation results from three I.T. experts. The ratings ranged from a lowest score of 4.67 to a highest score of 5.00, resulting in a mean value of 5.00, which is interpreted as "Excellent." These results indicate that the system successfully delivers a user-friendly and well-designed interface, effectively supporting administrators in managing system functions with ease and efficiency.
4. In terms of displaying user activity logs, the table above presents the evaluation results from three I.T. experts. One expert assigned a lower rating of 3, resulting in a mean score of 3.67. This lower evaluation was due to concerns that the system did not accurately record user activities and required further improvement. In response, the developers enhanced the activity log features to improve the accuracy and completeness of recorded data.
5. In terms of QR code generation and scanning for the time-in and time-out of visitors, the table above presents the evaluation results from three I.T. experts. The ratings ranged from a lowest score of 4.33 to a highest score of 5.00, resulting in a mean value of 4.67. This mean score is interpreted as "Moderately Functional." These findings indicate that the system is generally effective in facilitating QR code-based tracking of visitor entries and exits, although there may still be areas for improvement to further enhance accuracy and efficiency.
6. In terms of QR code generation and scanning for the time-in and time-out of visitors, the table above presents the evaluation results from three I.T. experts. The ratings ranged from a lowest score of 4.33 to a highest score of 5.00, resulting in a mean value of 4.67. This mean score is interpreted as "Moderately Functional." These findings indicate that the system is generally effective in facilitating QR code-based tracking of visitor entries and exits, although there may still be areas for improvement to further enhance accuracy and efficiency.
7. In terms of the functionality of secure user verification during login, the table above presents the evaluation results from three I.T. experts. The ratings ranged from a lowest score of 4.33 to a highest score of 4.67, resulting in a mean value of 4.59. This mean score is interpreted as "Moderately Functional."

These findings suggest that the system provides a generally reliable level of security during user authentication, although further enhancements may be implemented to strengthen its overall effectiveness and robustness.

8. In terms of usefulness, the system received a mean score of 4.42. Regarding ease of use, it also achieved a mean score of 4.42, and for ease of learning, the mean score was again 4.42. In terms of user satisfaction, the system was rated higher, with a mean score of 4.86. Overall, the total average across all USE (Usefulness, Satisfaction, and Ease of Use) questionnaire items is 4.53. These results are interpreted as "Agree," indicating that users generally perceive the system as useful, user-friendly, and satisfying to use.
9. The table presents the feedback from I.T. experts on the e-visitor logbook with face capture system, evaluated based on the software quality characteristics outlined in the ISO 25010 model. In terms of functional suitability, the system received a mean score of 4.55. Performance efficiency was rated with a mean of 4.33, while compatibility received a higher mean score of 4.71. Reliability was rated at 4.42, and security achieved a mean score of 4.67. Overall, all evaluated software characteristics are interpreted as "Slightly Satisfied," suggesting that the system generally meets quality expectations, though there is potential for further improvement to enhance performance and user confidence.

5. Conclusions

Based on the summary of findings, the following conclusion was derived. The MCC E-Visitor Logbook System: An Enhanced Logbook Annotation System with Face Capture Functionality is an enhanced and modernized version of the traditional visitor logbook system of Madridejos Community College. This newly developed system demonstrates full functionality according to the users' needs. The administrator can efficiently record, monitor, and manage visitor information through the system, while the face capture feature ensures secure and accurate visitor identification. The researchers conclude that based on the evaluation and feedback of the I.T. experts, the MCC E-Visitor Logbook System: An Enhanced Logbook Annotation System with Face Capture Functionality is usable, efficient, and reliable, providing a faster and more secure visitor management process for the entire Madridejos Community College. The MCC E-Visitor Logbook System: An Enhanced Logbook Annotation System with Face Capture Functionality is recommended for implementation due to its advanced functionality, improved security, and ease of use compared to the traditional manual logbook process. Finally, the proponents found that the E-Visitor Logbook System: An Enhanced Logbook Annotation System with Face Capture Functionality is functional, user friendly, and incorporates a centralized database capable of handling all visitor information efficiently and securely.

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