FULL BLOWN PROPOSAL

I. Project Information

Project Title: QR-Code Based Automated Classroom Attendance, Schedule, and Equipment Inventory Management System: Design and Development

Implementing Agencies: Bulacan State University
Research Management Office
Malolos, Bulacan

Cooperating Agency: Bulacan State University

Monitoring Agency: Bulacan State University
Research Management Office

Project Location: Bulacan State University
Malolos, Bulacan

Project Duration: January 2024 to December 2024- 12 months

Fund sources: Php. 250,000.00
Bulacan State University Research Funds

Project Leader: Jesse Edwin V. Gueco

II. Background Information.

Rationale:

QR-Code-Based Automated Classroom Attendance, Schedule, and Equipment Inventory Management System is an efficient and innovative solution to the traditional method of manually taking attendance and managing classroom schedules and equipment inventory. This is a technology-driven solution that aims to simplify classroom management for teachers and students.

Here is how the proposed system will work at BSU Hagonoy Campus:

- QR Code Generation: Each faculty and piece of equipment is assigned a unique QR code. These QR codes are generated and printed for each faculty and equipment.
- QR Code Scanning: Each classroom will have a QR Code Scanner where students scan their unique QR code from their Student ID when they enter. For Teachers, a given QR Code will be used to monitor their presence in the classroom. The system will then automatically record their attendance for the day.
- Class Scheduling: The system also includes a scheduling module that allows teachers and administrators to schedule classes, assign classrooms, and manage resources for each class.
- Equipment Inventory Management: The system includes an inventory management module that tracks the availability and condition of classroom equipment. Each piece of equipment is assigned a unique QR code, which is scanned to record its usage and maintenance history.
- Data Analytics: The system also includes a data analytics module that provides reports on attendance, class schedules, and equipment usage. This information can help teachers and administrators make informed decisions about classroom management and resource allocation.

Benefits of QR-Code-Based Automated Classroom Attendance, Schedule, and Equipment Inventory Management System include:

- Time-saving: The system saves time for teachers, students, and administrators by automating attendance tracking, scheduling, and equipment inventory management.
- Accuracy: The system ensures accurate attendance tracking and equipment inventory management, eliminating human errors.

- Efficiency: The system streamlines classroom management, allowing teachers and administrators to focus on teaching and learning.
- Accountability: The system provides a record of attendance, class schedules, and equipment usage, promoting accountability among students, teachers, and administrators.

In conclusion, a QR-Code-Based Automated Classroom Attendance, Schedule, and Equipment Inventory Management System for BSU HC is a technology-driven solution that simplifies classroom management. The system automates attendance tracking, class schedules, and equipment inventory management, promoting accuracy, efficiency, and accountability.

Related Literature and Studies

The following related literature and studies were reviewed to guide and use as references for additional information in the conduct of our research.

Wei-Hsiang Chen, Hui-Ching Wang, and Yi-Hsien Lin (2016) developed a smart classroom inventory management system (SCIMS) that utilizes Radio Frequency Identification (RFID) technology to manage classroom resources. The system was designed to track the inventory of classroom equipment and supplies, generate reports, and provide real-time monitoring. The study found that the implementation of SCIMS in a classroom setting resulted in an efficient and accurate inventory management process. The system provided real-time tracking of inventory and helped prevent equipment loss and damage.

Jinwei Zhao and Xudong Wang (2018) designed and implement a wireless classroom management system (WCMS) using RFID technology to improve classroom management efficiency. The WCMS was designed to track attendance, provide real-time feedback to teachers, and improve classroom security. The study found that the implementation of WCMS in a classroom setting resulted in improved attendance management, reduced administrative workload, and enhanced classroom security.

Chee Kit Looi, Chee Siong Teh, and Teck Wee Goh (2014) developed a classroom management system (CMS) using Near Field Communication (NFC) technology to manage classroom attendance and improve classroom management efficiency. The CMS was designed to allow teachers to take attendance by scanning student NFC-enabled ID cards using a mobile device. The study found that the implementation of CMS in a classroom setting resulted in improved attendance management, reduced administrative workload, and enhanced classroom security.

Palencia, J. K. A., & Macarampat, F. A. (2019) developed and implemented a digitalized classroom monitoring and inventory management system for schools in the Philippines. The system was designed to track attendance, manage classroom resources, and provide real-time feedback to teachers. The study used the Agile Model as the development methodology, and the system was developed using PHP and MySQL. The study found that the digitalized system improved classroom management and inventory management processes, resulting in reduced loss, increased accountability, and efficient monitoring of equipment and supplies.

A study by Mihalcea et al. (2018) examined the use of QR codes in the classroom and found that QR codes are an effective tool for engaging students in learning. The study also suggested that QR codes can be used to manage attendance and track the use of equipment in classrooms. This finding supports the development of the QR-Code-Based Automated Classroom Attendance, Schedule, and Equipment Inventory Management System.

Another study by Nandi et al. (2018) investigated the use of a similar system in a university setting. The study found that the automated attendance system reduced the time and effort required to manage attendance manually. The system was also found to be more accurate than manual attendance taking. These findings suggest that the QR-Code-Based Automated Classroom Attendance, Schedule, and Equipment Inventory Management System could have similar benefits in a classroom setting.

Furthermore, a study by Yeh et al. (2016) explored the use of technology in managing equipment in a university laboratory. The study found that an automated equipment management system reduced the time and effort required to manage equipment and improved the availability of equipment for students. These findings support the use of an automated equipment inventory management system in the QR-Code Based Automated Classroom Attendance, Schedule, and Equipment Inventory Management System.

There is ample evidence to support the development of a QR-Code-Based Automated Classroom Attendance, Schedule, and Equipment Inventory Management System. The system is expected to

improve the accuracy and timeliness of data collection, reduce the workload of teachers, and increase the level of engagement between students and teachers. The system could also have benefits for managing equipment in classrooms.

III. Project Objectives

General objective: To develop an automated system that can manage attendance, schedules, and equipment inventory in a classroom setting using QR codes.

Specific objectives

1. To develop a QR code-based attendance system that can accurately and efficiently track student attendance in classrooms.
2. To design a schedule management system that allows teachers to schedule their classes and manage their timetables.
3. To create an automated equipment inventory management system that tracks the use and availability of equipment in classrooms.
4. To integrate the attendance, schedule, and equipment inventory management systems into a single, user-friendly interface.
5. To evaluate the effectiveness of the system in improving classroom management and reducing the workload of teachers.

IV. Mechanism of Implementation

The area of study will be the campuses of the IT Hagonoy. The implementation of the QR-Code Based Automated Classroom Attendance, Schedule, and Equipment Inventory Management System involves several mechanisms that work together to achieve the system's objectives. The following are the key mechanisms of implementation:

QR code scanning: The system will use unique QR codes for each student. Students scan the codes to check in for class attendance, and teachers scan the codes to track equipment usage and availability.

Data collection and management: The system collects attendance, schedule, and equipment inventory data and stores it in a database. The system also uses the data to generate reports and alerts for teachers.

User interface design: The system includes a user-friendly interface that allows teachers to manage attendance, schedules, and equipment inventory efficiently. The interface includes features such as schedule management, attendance tracking, equipment inventory tracking, and reporting.

Technical and Operational Aspect

A QR-code based automated classroom attendance, schedule, and equipment inventory management system is a complex system that involves both technical and operational aspects. Some of the key technical and operational considerations for this system are:

Technical Aspects:

1. Existing QR Code: The QR codes for attendance, schedule, and equipment inventory management need to be collected for each classroom or location.
2. Laptop: A laptop needs to be controlled that can read the scan QR code to manage attendance, schedule, and equipment inventory for each classroom.
3. Database Design: A robust database needs to be designed to store attendance, schedule, and equipment inventory information for each classroom.
4. Network Connectivity: The system needs to be connected to a reliable and fast network to ensure smooth operation.
5. Security: The system needs to be secured from unauthorized access and data breaches.

Operational Aspects:

1. System Configuration: The system needs to be configured according to the requirements of each classroom or location.

2. User Training: The users (teachers and students) need to be trained on how to use the system.
3. Maintenance: The system needs to be regularly maintained to ensure its smooth operation.
4. Support: A support team needs to be available to address any issues or concerns that arise during the use of the system.
5. Data Backup: The data stored in the system needs to be regularly backed up to ensure that it is not lost in case of any system failure or disaster.
6. Policy and Procedures: Policies and procedures need to be established to ensure the proper use and maintenance of the system.
7. User Feedback: Feedback from users needs to be collected and analyzed to identify any areas of improvement in the system.

The QR-code-based automated classroom attendance, schedule, and equipment inventory management system requires a robust technical infrastructure, effective operational processes, and user support to ensure its successful implementation and operation.

Organization and Management

The composition and duties of the team are the following:

Project Leader:
Jesse Edwin V. Gueco

- Responsible for providing overall leadership and direction to the team, setting goals and objectives, and motivating team members to work towards the completion of the project.
- Developing a comprehensive research plan, including identifying research questions, defining the scope of the research, and creating a timeline for completion.
- Responsible for coordinating the activities of the team, ensuring that each member understands their roles and responsibilities and that communication is open and effective.
- Managing data, including collecting, organizing, and analyzing data. To ensure data is accurate, reliable, and secure.
- To identify and solve problems that arise during the research program. He will work collaboratively to find creative solutions and ensure that the program stays on track.
- Ensuring that the research program is conducted ethically and in compliance with regulatory requirements. This includes obtaining necessary approvals, maintaining confidentiality and privacy, and ensuring the protection of research participants.
- Responsible for documenting and reporting on the research program's progress and outcomes. This includes preparing reports, presentations, and publications that effectively communicate the research findings to the team.

Collaborator 1:
Edwin Garcia

- Managing data, including collecting, organizing, and analyzing data. To ensure data is accurate, reliable, and secure System Design
- Responsible for designing and maintaining the project database, ensuring that it is secure, reliable, and accessible to authorized users.
- Responsible for implementing the software and hardware components of the system, including writing code, testing and debugging the system, and ensuring that it meets the project specifications.
- Responsible for creating user manuals, technical specifications, and other project documentation to help ensure that the system is properly understood and used.
- Responsible for testing the system to ensure that it meets the project specifications, is free of bugs and errors, and is user-friendly.

Collaborator 2:
Marvin Garcia

- Managing data, including collecting, organizing, and analyzing data. To ensure data is accurate, reliable, and secure System Design
- Responsible for designing and maintaining the project database, ensuring that it is secure, reliable, and accessible to authorized users.

- Responsible for implementing the software and hardware components of the system, including writing code, testing and debugging the system, and ensuring that it meets the project specifications.
- Responsible for creating user manuals, technical specifications, and other project documentation to help ensure that the system is properly understood and used.
- Responsible for testing the system to ensure that it meets the project specifications, is free of bugs and errors, and is user-friendly.

Financial Plan

The research project cost amounts to two hundred fifty thousand pesos for the Personal Services and Maintenance and Other Operating Expenses(MOOE). The Personal Service consists of a Project Leader and 2 Research collaborators.

V. Timetable of the study

See attached sheet

VI. Budget Allocation

See attached sheet

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