OCABINS: a Progressive Web Application Inventory Management System for Old Cabalan Integrated School

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ABSTRACT

Digital communication has revolutionized the way businesses operate. It provides significant advantages, such as speed and efficiency, over traditional paper communications. Inventory management is another area where digitization has brought about significant improvements. Automated inventory processes allow businesses to quickly find items and check equipment in and out. In contrast, traditional inventory management systems require manual verification and recording of stock using pen and paper, resulting in a laborious and time-consuming process.

The objective of this research is to reduce the use of paper in inventory management by implementing a system that allows employees to check equipment in and out digitally. This will enhance the smooth functioning of the institution, saving time and resources that can be invested elsewhere. Choosing a data gathering technique will depend on various factors such as the size of the sample and the availability of resources. In conclusion, digitalization has made inventory management more efficient and effective while also reducing paper usage.

This study uses agile methodology emphasizes continuous improvement and incorporates feedback from stakeholders throughout the development process. Close-ended questions provide standardization in data collection and analysis, making it easier to compare and analyze responses across different respondents. 100% participants agreed that they need an Inventory Management System that will help them meet their goals and needs. This system will help them track and control inventory levels, reducing the risk of overstocking and running out of stock.The Old Cabalan Integrated School Inventory Management System streamlines the inventory tracking process and eliminates manual data entry and tracking, which can be time-consuming and error-prone. This frees up staff time for other tasks and improves overall efficiency.

Keywords
Inventory Management, Stocks, Order, Analytics, School Inventory

1. INTRODUCTION

Conventional inventory management techniques will result in undesirable workplace behaviors. According to research, corporate social responsibility and the environment don't mix well. Executing a process takes substantially longer than using direct data entry methods. negative effects on customer service and experience, particularly for consumers who have already mostly abandoned paper. This paper-based inventory can be cumbersome, time-consuming, and difficult. A 2012 McKinsey Global Institute study found that using digital management can boost productivity by up to 25%.

Digital communications give businesses the advantage of speed and efficiency over traditional paper communications. Inventory management is the distinction between using an inventory application and having to handwrite and digitally generate a report. It helps businesses determine which merchandise to items when and in what quantities, track inventory from product acquisition to needed, and recognize trends and react to them. Asset management at schools depends heavily on an inventory management system, which automates inventory processes to quickly find items and allow employees to check in and out equipment.

This research aims to provide a solution for Old Cabalan Integrated School to eliminate the use of paper in managing their inventory by allowing employees to check in and out equipment. This is especially important for lighting and plumbing assets, which are essential for the smooth functioning of the institution.

2. RELATED WORKS

2.1 COMPUTER BASED INVENTORY SYSTEM (2010)

Computer-based systems are complex and reliant on information technology, making work easier, quicker, and more accurate. Small and large businesses alike now rely on the automated system, but some still opt to use the antiquated technology-free system due to lack of resources and computer-illiterate staff. Businesses should switch to automated systems to increase output and efficiency, which would improve the reputation of the industry. One of the automated systems that different firms want the most is one that integrates inventory and purchasing.

The majority of inventory labor is divided between input, output, and restocking. Input is the process of adding new products to the inventory while removing the old ones, while output is taking things out of the inventory for use or sale, and refill is adding more products to make up for a lack of products or an increase in demand. Traditional inventory management systems require a person to manually verify and record the stock using a pen and paper, which is where operations with regards to all the stock will be archived.

2.2 INVENTORY MANAGEMENT SYSTEM SOFTWARE FOR PUBLIC UNIVERSITIES IN GHANA (IMSSPUG)

Together with optimizing warehouse operations, evaluate how stock levels affect purchases, sales, and restocking. Moreover, in the vast majority of businesses. The purchasing department will frequently review the inventory. software for checking inventory levels before ordering new products. This department can make better decisions if it has a current, accurate inventory. Installing an inventory control system can help an organization's work processes become simpler, which will enhance output and efficiency. Personnel might not be working effectively in the absence of an inventory control system. How information is transferred between staff another loses time, creating the possibility for error to take place in stocking.

For Ghana's higher education institutions, one of the biggest issues is managing inventory at public universities. The University for Development Studies is one example of a large, varied, and research-focused university where this is particularly true. Inventory management system software is the best remedy for Ghana's expanding public universities in reversing this shortcoming. In this research, we present software for Ghana's public universities' inventory management systems. The software manages stock supplies, stock issues, and sends management timely alert messages and reports so that they may make informed decisions. Moreover, it just needs 512 MB of internal memory to function and react quickly to commands.

The key advantage of an inventory management system is that time and money are saved by the system. Once more, countless man-hours are spent on the inventory management system. Implementation of a system that updates in real-time, processes all transactions at the store or warehouse will virtually eliminate the need to manually enter data. As soon as the warehouse/store employee posts the transaction, it is automatically updated into the accounting system. This saves time both in the warehouse/store and in the office.

2.3 POWERSCHOOL (2020)

PowerSchool is a student information system used by schools in the United States to manage student records, grades, attendance, and other school-related data. It also includes inventory management capabilities that allow schools to manage their inventory of materials, supplies, and equipment. A study by Zaman et al. (2020) found that PowerSchool's inventory management features were effective in tracking inventory levels and identifying materials that needed to be restocked. It also helped to reduce waste and improve cost savings by enabling schools to accurately track their inventory usage. The system was also found to be user-friendly and easily integrated with other school management systems.

An inventory control system is an important part of optimizing warehouse operations, as it helps the purchasing department make better decisions. It also saves time and money, as it updates in real-time, processes all transactions at the store or warehouse, and saves time both in the warehouse/store and in the office. Installing an inventory control system can help an organization's work processes become simpler, which will enhance output and efficiency

3. TECHNICAL BACKGROUND

3.1 EASE OF ACCESS

PWA (Progressive Web Application) is a type of web application that delivers a native-like user experience using modern web technologies. One of the main benefits of PWA is its ease of access, which refers to how easily users can access the application on different devices and platforms.

PWA is a web application that works on any device with a web browser, allowing users to access it without downloading and installing an app from an app store. It can be accessed by entering the URL in their web browser, just like any other website.

3.2 UTILIZED TECHNOLOGIES

3.2.1 FRONT END DEVELOPMENT

OCABINS aims to be accessible on any screen size—specifically on mobile devices where most of the target users will be utilizing. On that note, HTML, CSS, JavaScript, Bootstrap jQuery and its Progressive Web Application capabilities best fits the demand of this application

3.2.2 BACK END DEVELOPMENT

The utilization of a variety of back-end technologies proponents who combine the writing and editing tools and evaluate the program. The backers employed PHP and MySQL. and TypeScript for the application's back-end development. A relational database management system is MySQL. connected to the PHP coding language. It is a TypeScript. It is a JavaScript extension that improves and supports JavaScript. development. The types enable and statically catch errors. additional assistance for program development

3.2.3 SECURITY

OCABINS used Encrypt data in transit and at rest, HTTPS for secure communication, and SSL/TLS certificates to protect sensitive data stored in the database.

Employees should be trained on security best practices and policies, including password management, phishing awareness, and incident response.

4. RESEARCH METHODOLOGY

This research provides solutions that require research to identify potential solutions that are feasible with human or technological intervention.

4.1 PRE-DEVELOPMENT RESEARCH

As a result, the researchers were able to precisely and methodically characterize the circumstance or study region. Because the descriptive quantitative research design asks for the degree to which the variables were related to one another using various statistical instruments, it is utilized to create semi-structured questions.

Figure. 1 Agile Methodology [Okeke et al. 2019]

This study uses agile methodology emphasizes continuous improvement and incorporates feedback from stakeholders throughout the development process. This can help to ensure that the inventory management system is continually improving and

meeting the needs of the school. It is a lightweight software development method that focuses on customer satisfaction by delivering small and useful updates in a timely and consistent manner.

4.2 TEACHER SURVEY RESULTS

It is important to balance the use of close-ended and open-ended questions in a survey questionnaire to gain both quantifiable and qualitative information.

The choice of data gathering technique will depend on factors such as the size of the sample, the availability of resources, and the specific research questions being investigated. Based on the conducted research in Old Cabalan Integrated school, 8 participants took the survey consisting of 4 custodians and 4 teachers.

Close-ended questions allow for standardization in data collection and analysis, as all respondents are presented with the same set of options and are required to choose from them. This makes it easier to compare and analyze responses across different respondents.

Data gathering consisted of two parts; first, data was gathered through a survey-questionnaire. 8 participants have responded, their answers have been summarized below. A link has been provided to them through the use of Google Forms. There were two questions asked in the survey:

> Q1. Does the inventory management system meet the school's needs?

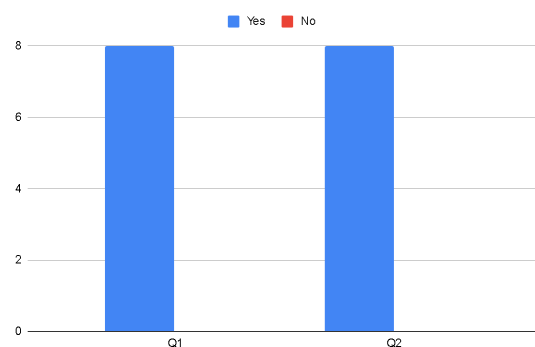> Q2. Will you approve implementing an Inventory Management System at OCabIS?

Figure 2. Summary of the survey participated by 8 respondents.

Next, an unstructured interview was conducted at OCABIS. The researcher went to Old Cabalan Integrated School and asked the key person, Mr. Mark Bobis for the system. He represented the school

as the beneficiary for this project. Summary of the interview is as follows:

[1] What are your insights about the Inventory Management System?

[Ito kasi yung is sa mga gusto kong mangyari, magkaroon agad ng inventory management system. Kasi taon-taon nagpapasa ako ng report regarding sa mga gamit ng school so mainam to na meron nang Inventory Management System... Alam ko na agad, meron na agad akong available data.]

[2] What are the advantages and disadvantages of having an Inventory Management System?

[Less work sa'kin. Basta dumating, ipinasa ko na sa IMS. Pag kailangan ko ng data, madali na lang kunin]

[3]Does the inventory management system meet the school's needs?

[Kung ano yung capability ng IMS na magagawa.]

[4] How can the inventory management system ease the burden of school custodians in their work?

[Yun siguro pag nag encode ako sa isang sheet lang, lahat na 'yon. Na maseseparate na yung equipment, sa furniture, sa lab equipment. Kung maee-ase yung burden saken , maibabato sa iba't-ibang data pag kinuha.]

[5] Will you approve implementing an Inventory Management System at OCabIS? Why or why not?

[Oo. gustong-gusto ko. Sabi ko nga pabor sa amin na halos taon-taon may dumating na gamit, may nawawalang gamit. Pabor na madaling kumuha ng data, pag kumuha ka ngayon, meron ka na agad.]

4.2 REQUIREMENT SPECIFICATION
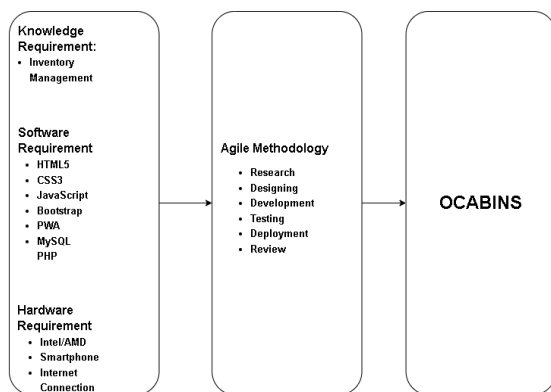
Figure 3. The Conceptual Model of OCABINS.

4.3 DATA AND PROCESS MODELING
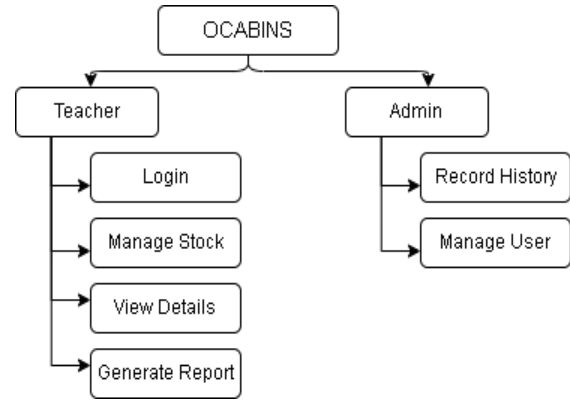
Figure 4. Functional Decomposition Diagram
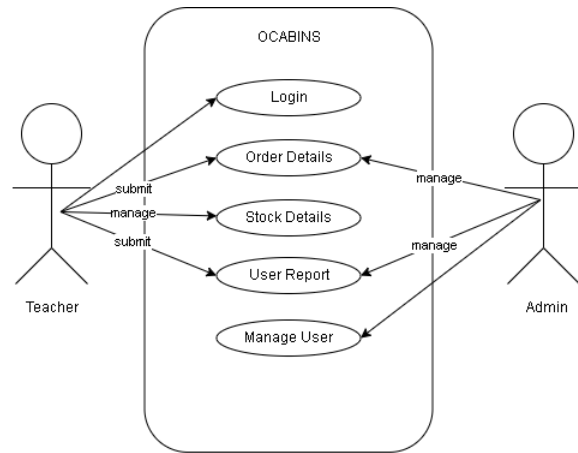
Figure 5. Use Case Diagram of OCABINS

4.4 DESIGN
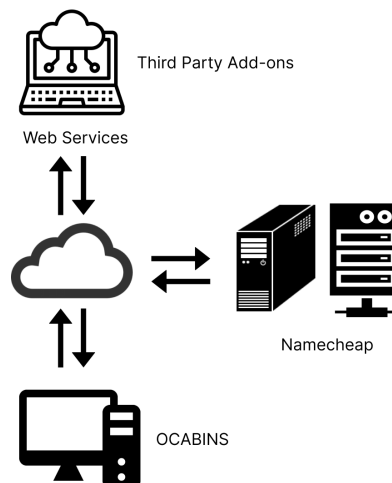
Figure 6. OCABINS Architecture

4.4.1 TEACHER
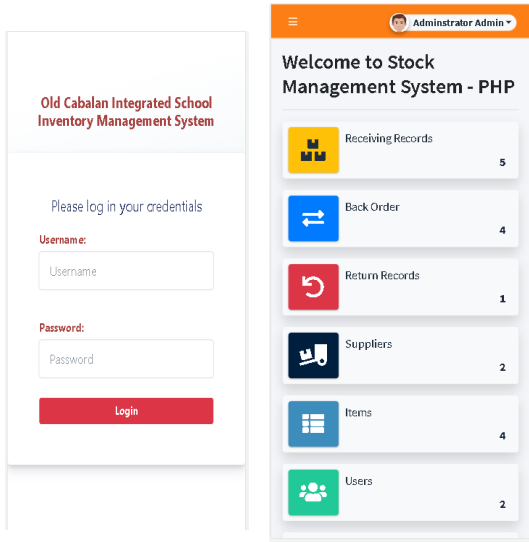
Figure 7. Dashboard & Login
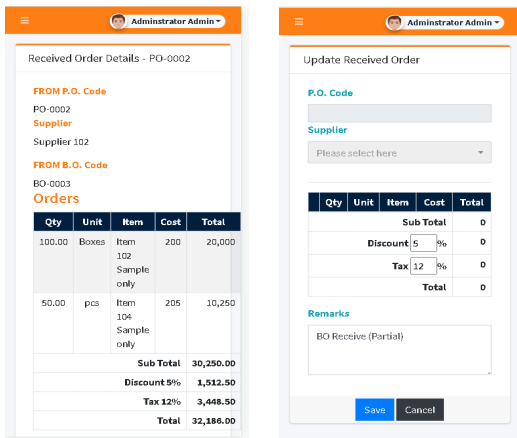
Figure 8. Received Order Details
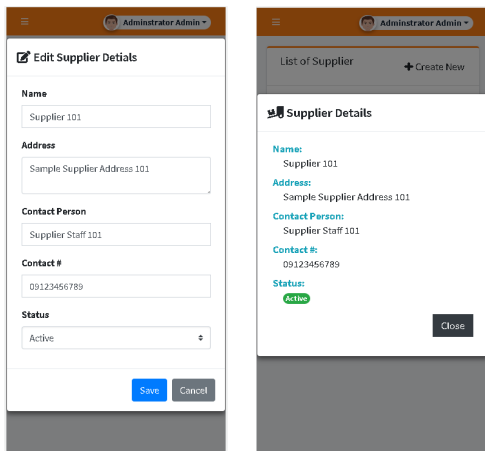
Figure 9. Supplier Details
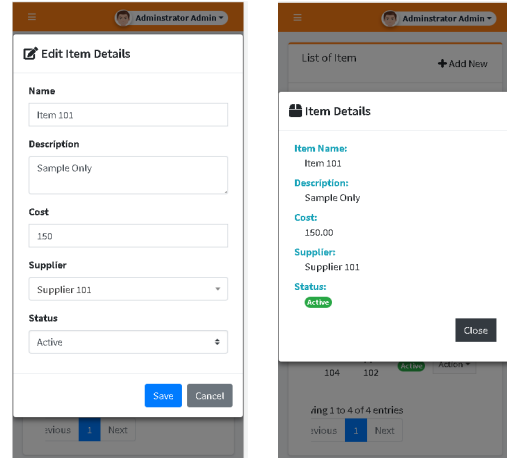
Figure 10. Edit Item Details
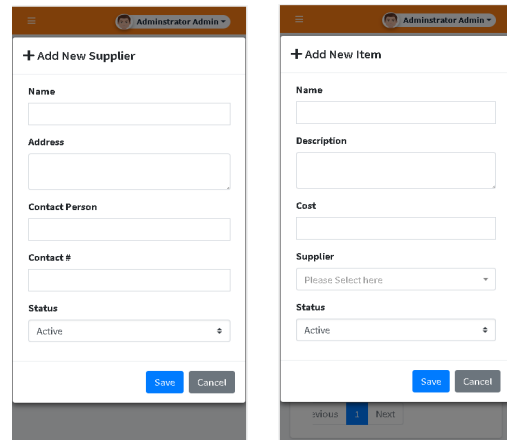
Figure 11. Add Item & Supplier Details

4.4.2 ADMINISTRATOR

Figure 12. Login Page
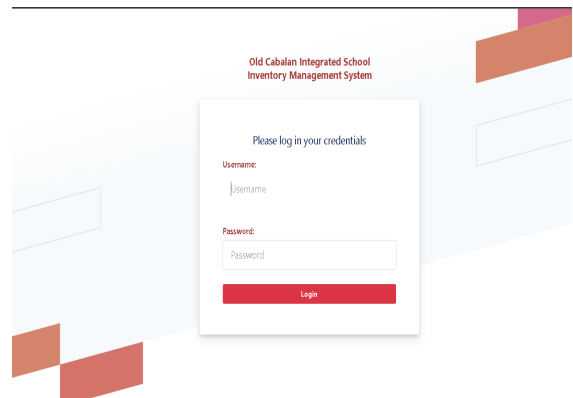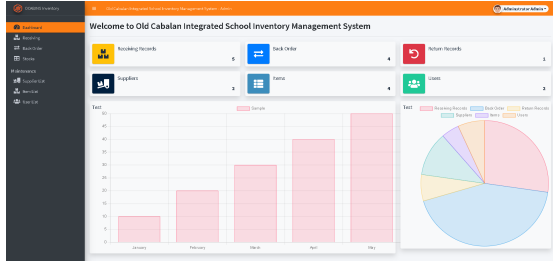
Figure 13. Dashboard

Figure 14. Receiving Order

Figure 15. Back Orders

Figure 16. Stocks

Figure 17. Supplier List

Figure 18. Item List

Figure 19. User List

Figure 20. Received Order View

Figure 21. Received Order Edit
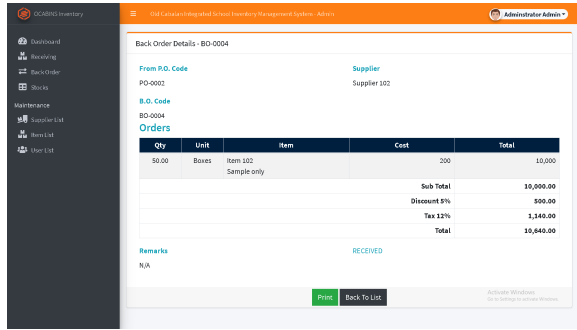

Figure 22. Received Order Print
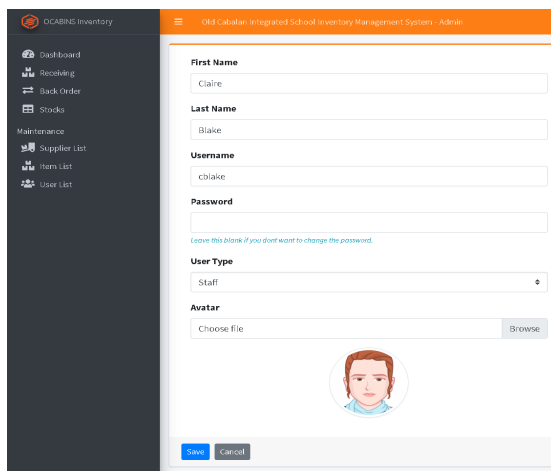
Figure 23. Received Order Print

Figure 24. Add new User

5. CONCLUSION

OCABINS development and user research resulted in conclusions about inventory concepts and societal problems. The Old Cabalan Integrated School Inventory Management System streamlines the inventory tracking process and eliminates manual data entry and tracking, which can be time-consuming and error-prone. This frees up staff time for other tasks and improves overall efficiency.

1. OCABIS uses a system to track and control inventory levels, reducing the risk of overstocking and running out of stock.
2. An inventory management system provides real-time visibility into inventory levels, usage, and trends, allowing schools to make data-driven decisions.
3. Schools can assign inventory management to specific indhividuals or departments, improving accountability and reducing risk of theft.
4. Schools can save money and optimize purchasing decisions by tracking inventory usage and reducing waste.

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