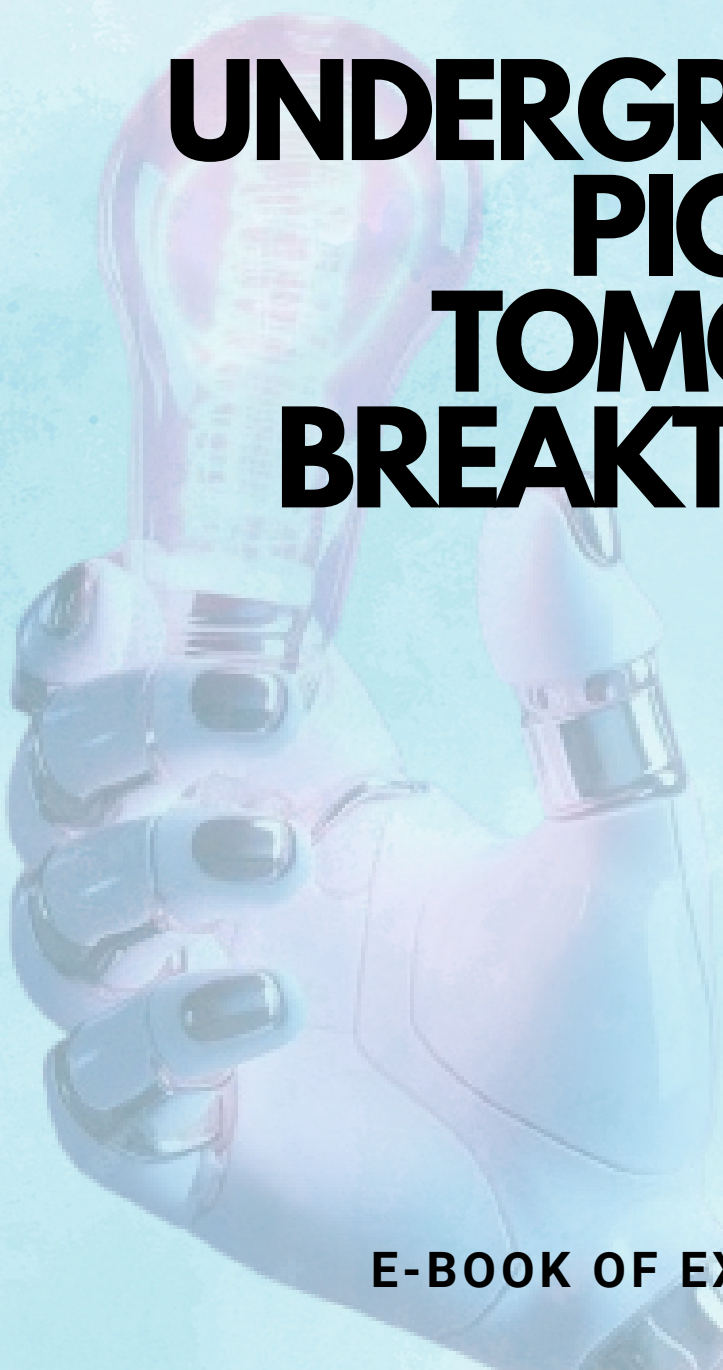




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INTERNATIONAL UNDERGRADUATE RESEARCH
INNOVATION, INVENTION AND DESIGN



UNDERGRADUATES PIONEERING TOMORROW'S BREAKTHROUGH

E-BOOK OF EXTENDED ABSTRACTS

BOOMOKI STOCK MANAGEMENT SYSTEM (BSMS)

Ahmad Fawaz Uzair Mohd Shamsul Irwan, Muhammad Asyraff Amran, Muhammad Hafiz Izzuddin Mohd Muzapar, Adam Harris Zainorin, Nor Zalina Ismail*, and Mohd Rizal Razak

Faculty of Computer and Mathematical Sciences, Universiti Teknologi MARA (Pahang),
Malaysia

*nza1601@uitm.edu.my

ABSTRACT

The service industry, such as cooked food provided by the restaurant, café or hotel, is a very important industry. Many food providers use manual cooking raw stock materials tracking that will lead to inaccurate inventory counts, increased food waste from spoilage and overstocking, and the risk of stockouts, which negatively impact profitability. Boomoki Stock Management System (BSMS) is aligned with the United Nations' Sustainable Development Goal (SDG) 12, which mentions responsible consumption and production to halve per capita global food waste at the retail and consumer levels and reduce food losses in the production and supply chains. The development of BSMS uses the waterfall development technique, which comprises five phases: requirements, design, implementation, verification, and maintenance. BSMS has three users, which are the kitchen staff, administrator and manager. Functions included in this system are updating the stock quantity, low stock alert, restock request and approval, raw material usage logging (daily tracking of consumed items), supplier management (detail and assign item) and report generating by week. This system leads to reduced food costs and waste, improved operational efficiency by preventing stockouts, minimises overstocking, helps in accurate pricing, and provides valuable data for better decision-making and optimised resource management.

Keywords: *Food Service Industry, Stock Management System, Web-Based Application*

INTRODUCTION

The service sector, especially culinary services provided by restaurants, cafés, and hotels, is essential for fostering economic growth and satisfying consumer needs. Nonetheless, numerous food suppliers persist in utilising manual techniques for monitoring raw stock materials, frequently leading to issues such as erroneous inventory counts, food deterioration, overstocking, and the potential for stockouts. These inefficiencies elevate operating expenses while adversely impacting profitability and customer satisfaction.

The Boomoki Stock Management System (BSMS) was created to facilitate ethical consumption and production, aligning with the United Nations' Sustainable Development Goal (SDG) 12. This objective highlights the necessity of diminishing global food waste at retail and consumer levels, alongside reducing food losses throughout production and supply chains (United Nations, 2015). The BSMS was developed utilising the waterfall model, which consists of five systematic phases: requirements, design, implementation, verification, and maintenance, hence assuring a structured and reliable development process (Balaji, S., & Murugaiyan, 2012).

The BSMS caters to three user categories: kitchen personnel, administrators, and managers. The primary functionalities encompass stock quantity updates, low-stock notifications, refill requests and approvals, daily monitoring of raw material use, supplier management, and weekly report generation. Through the integration of these elements, BSMS offers a novel solution to enhance inventory precision, reduce food waste, and improve overall efficiency in the food service sector.

RESULTS AND DISCUSSION

The BSMS can be used by three types of users, which are: administrators, kitchen staff, and managers. This section will discuss based on the type of system's users.

Administrators

BSMS allows the administrators to perform the stated functions: 1) Approve restock requests by kitchen staff, 2) Supplier management, 3) Assigning Supplier to specific items and 4) Manage the users of the system. Figure 1 shows the main interface for the administrator.

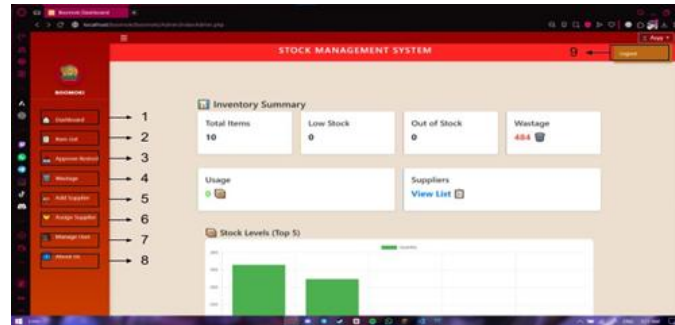


Figure 1: Main Page for Administrator

On the administrator's main page, the user can view the inventory summary, the graph of stock levels and 9 buttons that represent: 1) Dashboard, 2) Item List, 3) Approve Restock, 4) Wastage, 5) Add Supplier, 6) Assign Supplier, 7) Manage User, 8) About Us and 9) Logout. Figure 2 shows the interface for button number 3, which is Approve Restock. The administrator can approve the restock of raw material for cooking by kitchen staff or reject the restock request based on a certain situation.

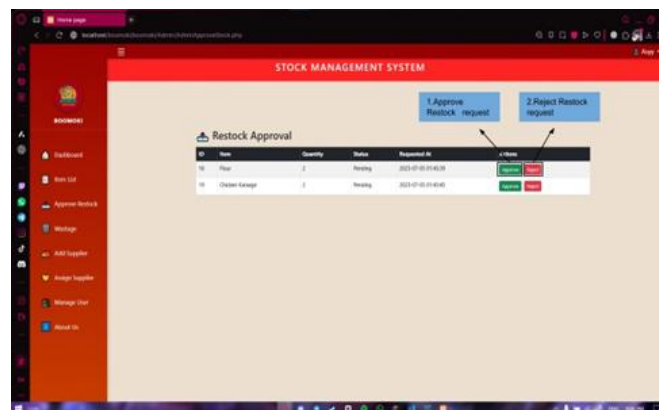


Figure 2: Approve Restock Interface

The raw material supplier is a crucial stakeholder in the cooked food industry; thus, Figure 3 illustrates the interface for adding a new supplier, while Figure 4 depicts the interface for assigning specific raw materials or items to that supplier. The administrator has the authority to remove the supplier's assignment and reassign it to a different supplier. This function is crucial for ensuring that the record of supplier details is organised and can be synchronised with the things they provide.

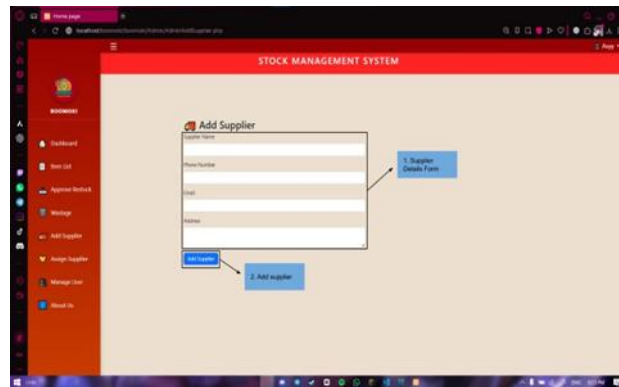


Figure 3: Add New Supplier Interface

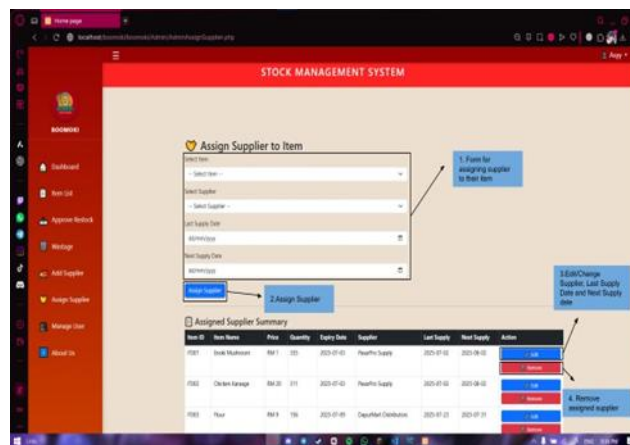


Figure 4: Assign Supplier to Item Interface

Kitchen Staff

The secondary users of the BSMS are kitchen personnel, who are responsible for food preparation. Figure 5 illustrates the primary interface for culinary personnel. The kitchen personnel are capable of 1) managing stock (adding/updating/deleting goods), 2) seeing low-stock alert notifications, 3) submitting restock requests, 4) receiving approval for restock requests, 5) reviewing wastage records, and 6) monitoring usage logs (daily tracking of consumed raw materials). To utilise the item, kitchen personnel must document the usage facts as illustrated in Figure 6.

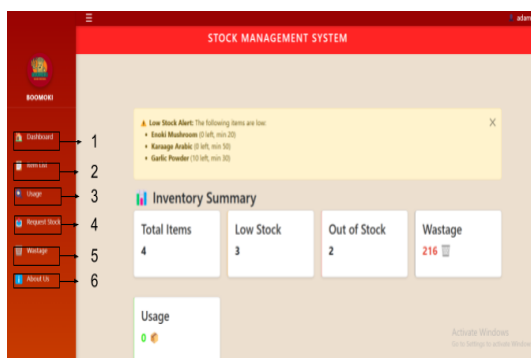


Figure 5: Kitchen Staff Main Interface

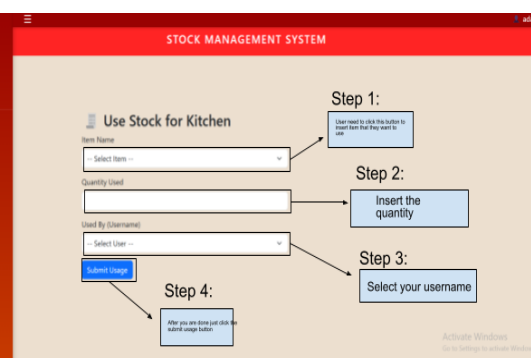


Figure 6: Usage Stock Interface

Manager

The third category of BSMS users is the manager. Managers have very minimal function in the usage of BSMS. The system can provide automated general and weekly reporting for the manager. Figure 7 shows the main interface for the manager. The button represent: 1) Dashboard(back to dashboard), 2) Report(view report) and 3) About Us(view the system's developer detail).

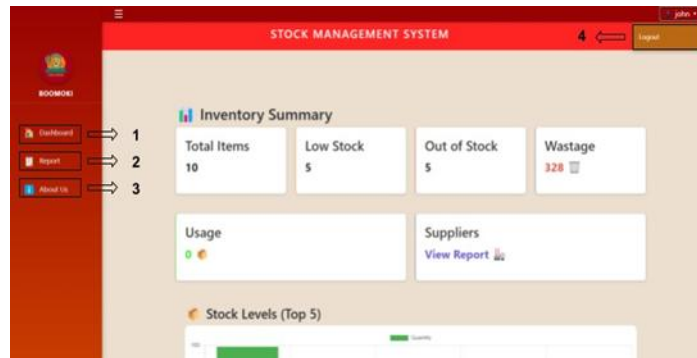


Figure 7: Manager Main Interface

The system can be beneficial for the cooked food service provider by easing the stock and supplier management. In addition, this system can have a positive impact on environmental conservation by tracking the wastage of the material.

CONCLUSION

The Boomoki Stock Management System (BSMS) exemplifies a pragmatic and inventive solution to the inefficiencies in raw material monitoring in the food service sector. By incorporating functionalities such as inventory amount tracking, low-stock notifications, restock request authorisations, supplier allocation, and daily consumption recording, the system guarantees precise inventory management while reducing waste and averting stock shortages. The systematic development approach utilising the waterfall model enhances the system's reliability, rendering it appropriate for implementation by restaurants, cafés, and hotels that depend significantly on effective stock management to sustain profitability and customer pleasure.

In addition to operational advantages, BSMS supports wider sustainability goals by conforming to the United Nations' Sustainable Development Goal (SDG) 12 regarding responsible consumption and production. By minimising food waste and facilitating optimal resource utilisation, the system not only decreases expenses but also fosters environmentally sustainable practices within the culinary industry. BSMS serves as an essential instrument that integrates technology, efficiency, and sustainability, enhancing decision-making capacities for food service operators and offering enduring competitive advantages.

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