INVENTORY MANAGEMENT SYSTEM WITH FORECASTING FOR TRIPLE J SAVERS MART

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***Abstract*— The Triple J Savers Mart's proposed Inventory Management System (IMS) with forecasting is a cutting-edge solution created to optimize their inventory operations. Inventory tracking, demand forecasting, order optimization, supplier management, and thorough analytics are all features of this system. In order to gain a competitive edge in the retail market, Triple J Savers Mart can effectively manage their inventory across multiple locations and adapt to business growth by utilizing accurate demand predictions and automation. Its goals are to increase customer satisfaction, cut costs, and enable data-driven decision-making.**

1. Introduction

Providing high- quality goods at comparatively low prices is key to effective inventory management. They also emphasize the necessity of establishing daily ordering and periodic inventory turn calculations [1] Demand forecasting is crucial for managing logistics procedures in retailing. The resulting forecasts' effectiveness directly influences processes in retail establishments and the supplier chain to which they belong [2] A web- based Inventory Management System, like the one we recommended for TRIPLE J SAVERS MART, can offer additional advantages. With remote access, business owners and managers may monitor inventory levels anytime, anywhere, providing them greater freedom and control. Web- based solutions can also be scaled up or down to accommodate business growth or changing needs. To meet particular needs, they can be modified. A complete Inventory Management system is essential for every business looking to improve productivity, boost client happiness, and promote growth. By automating monotonous tasks, speeding up transactions, and providing valuable data on company performance, Inventory systems may help businesses stay competitive and profitable in the present market. TRIPLE J SAVERS MART is a grocery store in Cabuyao Laguna (0118 Banay-banay Cabuyao) founded in 2003. They cater to the p3 and needs of various clients. This entails stocking a wide variety of snacks, beverages, household necessities, baked foods, canned goods, and other stuff The client's manual Inventory process needs to be improved, leading to longer wait times and unsatisfactory experiences for both the client and her customers. This results in lost sales, reduced customer satisfaction, and potential challenges competing with modern businesses with Inventory systems. The root cause of the problem is the inefficient manual Inventory process, which cannot keep up with the demands of the client's business. To address these issues, upgrading the inventory with demand forecasting improves efficiency, accuracy, and inventory management, increasing customer satisfaction and long- term success for the client's business. Based on the identified conditions, the researchers decided to develop an Inventory Management system with Demand Forecasting for the client's business. This system aims to address the inefficiencies and errors caused by the outdated manual system Improve efficiency and accuracy and enhance inventory management. Upgrading the inventory system can help the client increase customer satisfaction, reduce wait times, and improve the overall success of their business. There searchers are committed to finding a solution that will meet the client's needs and help them compete in the market.

1. Objective of the study

The objective of this study is to design and develop an Inventory management system with forecasting for TRIPLE J SAVERS MART. Specifically, this study aims to:

1. Determine the current practices and problems encountered by the business with regards to:

a. inventory management processes

b. data insight

c. monitoring of expiration dates and

d. generating reports

e. security and data privacy

1. Determine how to develop the proposed system in such a way that it would provide:

a. inventory management processes

b. data insights using demand forecasting features

c. notifies alerts for expiring products

d. provides inventory reports

e. security and data privacy measures

1. Determine the assessments of the end users regarding the proposed system in terms of:

a. functionality;

b. reliability;

c. efficiency;

d. usability;

e. acceptance and security

1. Determine the assessments of the web specialists regarding the proposed system in terms of:

a. design and functionality

b. performance and scalability of the system

c. compliance

d. security and data privacy

Review of Literature And Studies

Effective inventory management is a crucial component of any successful business. The inventory of a project is considered one of its most valuable resources and requires dependable and precise leaders. Proper inventory management ensures a smooth production process and helps prevent stock shortages, overstocking, and increased costs. In today' competitive market, businesses must invest in robust inventory management systems to stay ahead of their competitors

[3].Models for inventory control are flexible, and results could differ from those of earlier models. One of the models that is most frequently used in studies is EOQ. The application of shortage also increases this model's appeal to researchers. The need may include back orders, lost sales, partial back ordering (PBO), or a combination

[4].The impact of reliability and time- based demand rate on the inventory management system is examined using an economic order quantity (EOQ) model. Partial backlogging allows the effect of ongoing deterioration and shortages. Giving the best possible customer service while keeping inventory costs as low as possible is the primary goal of a good inventory management system

[5]. Managing the inventory flow across the value chain is one of the most critical elements of running a successful business, regardless of size. Maintaining inventory supply and demand balance can take business time and effort. Ideally, a company should have enough inventory to meet customer demand without experiencing stock- outs while avoiding keeping an excessive amount of stock on hand, which can be costly

[6].Inventory management systems are crucial for companies that handle inventory tracking and identification. These systems help to establish and manage inventory levels by maintaining records of goods sold and sales data organized by date. By utilizing inventory management systems, businesses can avoid concerns with out- of- stock and excess inventory

[7]. Some companies produce items ahead of actual demand and keep them in stock to increase capacity utilization and improve customer response times. Finished goods inventory then acts as a stand- in for production capacity and can be thought of as stored production capability, similar to energy stored in batteries [8]. Inventory cost may vary in retail, but it carrying cost significantly impacts store profitability. Multi- category and multi- branded retail stores that cater to different consumer needs must manage their inventory effectively to ensure customer satisfaction and maximize profits. Effective inventory management is especially crucial for these stores as they offer products designed for specifically few stages and consumer needs

[9]. Demand forecasting is an important phase in predictive analytics for determining future demand. In addition to improving supply chain management and customer satisfaction by avoiding inventory stock- outs, demand forecasting also ensures appropriate supply chain management

[10].We can use the standard statistical models, such’s moving average and exponential decay, to model time series. ARIMA and smoothing. These models have linear behavior because Future values must be linear functions of historical data. Researchers have concentrated on linear models over the past few decades because they have shown application and understanding of simplicity. Demand is primarily forecasted using timeseries forecasting models

[11].The procedure is intended to compare the effectiveness of various machine learning techniques with conventional statistical methods using thousands of historical transaction records from a major grocery retailer. In order for businesses to quickly select their preferred model, the following criteria are also explored in this study: predictive performance, generalization capability, runtime, cost, and convenience

[12]. The success of Supply Chain Management (SCM) and the organizations that support it, as well as those that are in the early stages of a digital transformation are impacted by demand forecasting. It may signify the most significant shift in the integrated SCM era in today' s complex, dynamic, and uncertain environment. Any business that wants to survive must be able to predict customer demand accurately in an SCM

[13]. Enhancing the efficacy and efficiency of trading enterprises in the course of business transactions, as well as minimizing errors and improving the timely and correct delivery of information and transaction data, are the goals of this study. It is still manual, meaning that it is not a fully computerized system that powers the sales system. In order to estimate the future supply of commodities, forecasting is the method that is used. By using a single moving average and trend projection, trading organizations can increase their effectiveness and efficiency, which in turn helps to improve information delivery that is accurate, timely, and error- free while also minimizing transaction data errors. It is still manual, meaning that it is not a fully computerized system that powers the sales system

[14].By utilizing forecasting techniques, inventory management aims to increase effectiveness and efficiency that support trading businesses during business transactions, improve information delivery that is timely, accurate, and complete, and reduce errors. The system currently used for the sale of goods is still manual, meaning that it needs to be sufficiently computerized. Forecasting is a technique employed to estimate the future stock of goods: trend projection and a single moving average

[15]. The need for predicting data related to general market demand has increased due to the rapidly shifting nature of the market, intense competition, and the necessity to address significant business- bearing issues. The mean experience of projecting market demand in a dynamic, competitive market determines inaccurate outcomes of the analysis of market demand and invalid business decisions

[16].For supply chain management, demand projections are essential. The underlying principle for any replenishment system is the anticipated demand for a particular product. Several forecasting methodologies have been established, each having unique benefits and drawbacks compared to other strategies. This motivates the creation of hybrid systems that combine many methods and their capabilities. This study presents a hybrid intelligent system that uses neural networks and Autoregressive Integrated Moving Average (ARIMA) models to forecast demand

[17]. Researchers in Harare, Zimbabwe, did a study to evaluate the manufacturing industry’s inventory management (IM) practices of small and medium-sized businesses (SMEs). The study population comprised SMEs at the Gleview Complex, Siya So Mbare, Kuwadzana, Gazaland, and Magaba industrial sites. According to the study, most SMEs manage their inventories using the Just-In-Time method since they must familiarize themselves with other computerized systems and techniques

[18]. An Internet of Things (IoT)-based warehouse inventory management system was created to track products connected to tags with product information and corresponding time stamps for additional verification. To keep track of all the data, the Raspberry Pi served as the primary server

[19]. Higher levels of inventory management practice can boost competitive advantage and organizational performance, according to a study examining how it affected firms’ competitiveness and organizational performance. Additionally, it was discovered that competitive advantage directly improved organizational performance

[20].Another study sought to ascertain the impact of the inventory management system on the decline in small-scale restaurants' profits in the four districts of the province of Quezon. The study aimed to offer recommendations and fixes for the issues that restaurants regularly face

[21]. Traditional inventory management models may need to be more effective in the context of growing businesses and the ongoing demands of product diversity due to their high effort and poor efficiency. As a result, this research developed a novel sort of intelligent Inventory Management System based on the Internet of Things (IoT). The system, which has many benefits over conventional approaches, is described in the paper along with its concepts and organizational structure. The system is anticipated to have promising development possibilities

[22].The manufacturing sector is being forced to create new business models due to the digital economy's change to achieve operational excellence. A crucial method for improving supply chain effectiveness and reducing the Internet of Things (IoT)'s (bullwhip) consequences is vendor management inventory (VMI). The manufacturing supplier's issues include their inability to quickly incorporate pertinent inventory information into the IoT and trouble collecting information about inventories at the hub. An integrated Hub VMI system is the suggested solution to address the inventory issue. This case study aims to establish an all in-one integrated Hub VMI in an electronic manufacturing company. This proposal has two models: one is a stock transfer order (STO)/sales order (SO) structure, where the product is manufactured on-site after the purchase order is accepted, and the other is a purchase order (PO)/sales order (SO) structure, where the PO is accepted on-site but the product is manufactured elsewhere. An intelligent Radio Frequency Identified (RFID) system is created in this case study to extract product information from an inventory and provide a product per customer service recommendations

[23].To minimize inventory-related costs and maximize service levels with a considerable decrease in treatment costs and resource waste, inventory management in a healthcare system must be compatible with its operations and important characteristics. Researchers and practitioners have created a wide range of tools and approaches to model and analyze different inventory management systems in the health care industry while considering these factors. The inventory systems used in health care are categorized and critically analyzed in this research, along with the available modeling methodologies and solution methods. An integrated research framework appropriate for the current setting is offered as a direct result of the literature review and future research directions

[24].Typically, supplies or goods are kept in warehouses. Finding any goods in the warehouses is particularly difficult because it requires a lot of time and effort to search thoroughly through all available stockrooms physically. As a result, the warehouse inventory management system is quite helpful in preventing this problem since it maintains track of the details of the individual products and informs us of the stockroom in which the products are kept. The warehouse inventory management system is essential to many manufacturing and goods-based techniques. Although several wireless communication technologies exist, RFID works best for the warehouse inventory management system. Through the use of an internet-enabled wireless link, the transmitter part transmits the tag data to open-source hardware. The Internet of Things (IoT)-based warehouse inventory management system is designed to track the products linked to tags and provide product information and their associated time stamps for additional verification. The Raspberry Pi keeps track of all the data as a central server. The entire system provides an archetype to match the material and information flow. The website is designed with ease of use and an interface for the user to track the products in mind. Comparing the proposed system to the current warehouse inventory management systems, the developed system is significantly more affordable and operates dynamically

[25].An online system called At-Thoyyib Inventory Management System is being created to make it easier to manage inventory, including the entry and exit of items from storage. The primary goal of this system development is to help At-Thoyyib Shop manage its stock in an organized and effective manner. The system employed in the At-Thoyyib Shop is operated manually, which has been shown to be an issue based on observations and interviews. For instance, there are a few drawbacks if the inventory data were entered into a book. Books are perishable, and someone could enter the data incorrectly. This system aims to create are port module for data entering and exiting the inventory and to make the information products easier to obtain. The waterfall model has been the methodology employed in this developing system. The waterfall approach has the benefit of being simple to convey to users. This model uses a well-defined structural approach for the activities at each step. A project's planning and scheduling are also helpful. In conclusion, the development of the inventory management system aims to speed up the process of capturing inventory data as well as increase the precision and efficiency of producing management-required reports

[26].This study examines Describing a system for managing the kitchen that is effective in inventory. Implementing Inventory System allows us to constantly have records of our grocery stock values that are current. And Unlike before, we don't need to commit grocery stock information to memory. Conventional methods. The concept makes use of the load cell and HX711 interface between a load cell amplifier and a Node MCU for measuring the worth of a grocery container can be shown in the user's using cloud service, a smartphone, or a computer

[27]. Demand forecasting is critical for retailers because it is required for many operational decisions. One of the largest issues is predicting demand on special days when demand patterns differ considerably from regular days. With a focus on special calendar days, we address the difficulty of anticipating the daily need for various product categories at the shop level using the example of a bakery chain. Decisions on manufacturing and purchasing are guided by these forecasts

[28]. When a large number of search intensity indices are used as tourism demand indicators, traditional forecasting models for demand may need help. This study used a deep learning approach to examine the framework for predicting the number of visitors arriving in Macau each month. According to the empirical findings, the deep learning strategy significantly outperforms support vector regression and artificial neural network models. Additionally, the proposed deep network architecture's creation and identification of highly pertinent aspects allows practitioners to comprehend the connections between many factors that affect projecting tourist demand and the number of visitors

[29].The market for goods with short life cycles (SLCP) is cyclical and highly changeable, and more sales data must be collected. Therefore, conventional forecasting techniques are typically insufficient in this dynamic environment. We offer a strategy for forecasting SLCP demand using timeseries of comparable items or analogies to get around this problem. Algorithms for clustering and linear regression are used to choose and weigh suitable analogies. Seven analog- based forecasting methods, including two non-linear regression implementations, are compared to the proposed method. We could generate forecasts for diverse sets of time series that were more precise while processing quickly compared to other methods

[30]. Demand forecasting for fad products continues to be a difficult challenge for academics and industry, despite the numerous successful methodologies investigated and examined in the literature. The arrival of the significant data era brings about a new revolution in predicting demand for popular goods and seriously jeopardizes the usage of traditional forecasting methods and inventory management. We first conduct a detailed literature review on demand forecasting methods for trending products to understand the challenges associated with employing standard forecasting approaches. Next, we examine how a fashion store approaches the issue of future demand forecasting and inventory planning using a real- world case study

[31]. Accurate demand projections are necessary for the management of spare component inventories. In the academic literature, a variety of statistical methods have been developed to cope with forecasting the requirement for spare parts. These methods are used in both parametric and non-parametric approaches. The current article closes this gap by reviewing the bootstrapping approach literature and discussing some of its statistical characteristics. Therefore, the reported mixed performances of the existing bootstrap-based forecasting algorithms can be explained more convincingly. This paper's review of the service level models related to the bootstrapping process emphasizes the fill rate models

[32].Demand forecasting is crucial in managing the supply chain and logistics. the essay addresses prevalent approaches and significant difficulties in predicting demand in the pharmaceutical industry. The pharmaceutical supply chain's integrated process for determining in-market product demand and generating purchase orders is outlined. A case study of pharmaceutical product distribution by a wholesaler to a business in a developing market illustrates the point. The SMA model, multiple linear regressions, and symbolic regression with genetic programming are further forecasting models for the empirically investigated baseline demand estimates, along with information on each model's applicability in real-world settings

[33]. Analysis of demand data from the previous period is the first step towards forecasting, which determines the amount of demand projected in the future. When it comes to predicting, Trend Projection is the best method out of the five because it has the minimum error, as indicated by the MAD and MSE values [34]

1. Methods and Procedures
2. *Research Design*

The researchers will employ the purposive sampling technique to estimate how many respondents will evaluate the suggested web-based system after it is developed. Using their knowledge to select particular individuals who will aid the study's objectives, researchers employ the non-probability technique of "purposive sampling" to gather a sample. To evaluate their study question, the researchers must consider these respondents' unique qualities.

1. *Research Design*

After it has been developed, the proposed web-based system will be evaluated by end users and web professionals, as shown in Table 3. After installation, the system's end users will be TRIPLE J SAVERS MART staff members. Degree holders in computer-related fields with at least four years of professional experience in web development are the requirements for selecting web specialists. Twenty (20) end users and ten

(10) Web professionals would evaluate the suggested web-based system. There were thirty study participants. Ascertain how the answers were distribute

1. *Respondents of the Study*

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Table 1 Respondents Of The Study

|  |  |
| --- | --- |
| **Category** | **Number of Respondents** |
| End Users | 20 |
| Web Experts | 10 |
| **Total** | **30** |

Table 1 shows the category, population, and total of respondents in the study. The category respondents of Twenty (20) end users and ten (10) web professionals would evaluate the suggested web-based system. There were thirty study participants. Ascertain how the answers were distributed

1. Results And Discussion

Triple J Savers Mart is a retail establishment that faces several challenges in its business processes, particularly in the area of inventory management. Currently, the company relies on manual methods for tracking inventory, utilizing spreadsheets or paper- based systems. This manual approach involves employees physically counting and recording inventory levels, leading to potential inaccuracies and inefficiencies in the overall inventory management process

Additionally, the decision-making process for reordering points and restocking is primarily based on guesswork or historical data, needing a systematic and data-driven approach. Furthermore, the limited integration of bar coding or RFID technology exacerbates the difficulties in maintaining accurate and real-time inventory information. Collectively, these challenges contribute to operational inefficiencies, potential errors, and sub-optimal decision- making within Triple J Savers Mart's inventory management system

Triple J Savers Mart monitors its inventory management system predominantly through manual methods. The process involves employees physically counting and 46 recording inventory levels, relying on spreadsheets and paper-based systems to maintain records of inventory transactions. This manual approach entails a step-by-step process of checking each item in stock, making notes of changes, and updating spreadsheets accordingly.

In terms of responsibility, the company has designated four different account roles— System Admin, Data Admin, Desk Admin, and User Employee. The level of access to the inventory management system varies based on these roles. However, the current manual inventory management process at Triple J Savers Mart has its challenges. One of the prominent issues is the high likelihood of human error in data entry and counting. The reliance on manual recording increases the risk of inaccuracies, leading to discrepancies in inventory levels.

Triple J Savers Mart faces challenges in the effective utilization of data analysis tools and business intelligence software. While there have been instances where these tools have been employed to inform decisions, their application could be improved, primarily due to resource constraints within the organization. The manual nature of inventory checks, particularly in a large inventory, proves to be time-consuming, presenting a significant challenge. Moreover, there is a heightened risk of human error, particularly in recording expiration dates, which could have implications for product quality and customer satisfaction. The company recognizes that automating these processes could enhance both efficiency and accuracy in managing inventory.

Another notable challenge is the time and effort required for manual report creation, leading to potential delays in decision-making processes. The limited customization options of the reports further exacerbate this challenge, making it difficult to tailor reports to meet the diverse needs of various stakeholders within the organization. This limitation in customization hampers the ability to generate insights that are specifically relevant to different departments or individuals, hindering the overall effectiveness of data analysis tools and business intelligence software in informing strategic decision

Triple J Savers Mart acknowledges challenges related to data security and privacy. The need for stronger data encryption, better access controls, and improved employee awareness of data privacy is essential. Additionally, the company recognizes the importance of a more comprehensive approach to documenting and ensuring compliance with data protection regulations. Addressing these challenges is crucial for Triple J Savers Mart to leverage the full potential of data analysis tools and business intelligence software, ultimately enhancing the efficiency and security of its operations.

*A. Assessments of Target Users and Web-Experts Regarding the Proposed Barangay Service Management System*

The assessment of the users shows the responses of the users and web-experts to the proposed system and provides feedback in percentages and medians regarding the Functional Suitability, Reliability, Efficiency, Usability, and Security of the proposed system.

Assessment of the Users Table 2. Mean for the Assessment of Users under the Category of Functionality

|  |  |
| --- | --- |
| **Functionality** | **End Users** |
| Q1 | Agree |
| Q2 | Strongly Agree |
| Q3 | Strongly Agree |
| Q4 | Strongly Agree |
| Q5 | Strongly Agree |
| Q6 | Strongly Agree |
| Q7 | Strongly Agree |
| Q8 | Strongly Agree |
| Q9 | Agree |
| Q10 | Strongly Agree |
| Q11 | Agree |

Table 2 showed In Q1, the researchers received evaluations of 30% (SA) and 70% (A). 30% of users strongly agreed, likely reflecting their belief that the system did not honestly want to improve its ability to provide status information for incoming inventory items. The remaining 70% of users agreed with the weighted mean of 4.2 it shows that almost all of whom felt that the system could provide the status of all incoming inventory items. In Q2, the researchers received evaluations of 100% (SA) with the weighted mean of 5.0 it shows that all end users believed that the system could efficiently capture all incoming inventory items. In Q3, the researchers received evaluations of 75% (SA) and 25% (A). Nearly all of the users stated that the system successfully identifies duplicate product inventory items, and 75% of users strongly agreed. With the weighted mean of 4.7 it shows that majority of users agreed that the system effectively identified duplicate products. In Q4, the researchers received evaluations of both 50% (SA) and (A). 50% of the users believed that the system can notify about the stock levels, and the other half, 50%, with the weighted mean of 4.5 it shows that it needs to improve notifying stock levels. In Q5, the researchers received evaluations of 100% (SA) with the weighted mean of 5.0 it shows that all users believed that the system can support batch tracking for inventory items. In Q6, the researchers received evaluations of 100% (SA) with the weighted mean of 5.0 it shows that all users believed that the system could efficiently capture all incoming inventory items. In Q7, the researchers received evaluations of 70% (SA) and (30%) with the weighted mean of 4.5 it shows that majority of the users strongly agree that almost all the users believed that the system can perform forecasting on the demand for items and the remaining of users agree that they want to enhance the system's ability to forecast item demand. In Q8, , the researchers received evaluations of 100% (SA) with the weighted mean of 5.0 it shows that all users strongly agree that the system can provides data management features (add, edit, delete and search). In Q9, the researchers received evaluations of 85% (A) and (15%) D with the weighted mean of 3.8 it shows that almost half of the users agree that the system can help to prevent excess inventory stocks. In Q10, the researchers received evaluations of 100% (SA) with the weighted mean of 5.0 it shows that all users believed that the system can offer reports on the inventory items. In Q11, the researchers received evaluations of 25% (SA) and (75%) A. with the weighted mean of 4.2 it shows that majority of the users agree that the system provide reports for expired products. In overall, a moderate level of performance across the assessed criteria is found in Table 2 with an overall mean under the category of functionality with a score of 4.5%. The highest score of 5.0%. It indicates that certain aspects within the functionality category have shown exemplary performance, which may serve as a benchmark for improvement in other areas. Overall, these findings indicate a generally good functional performance with specific areas showing potential for optimization and improvements.

Table3. Mean for the Assessment of Users under the Category of Reliability

|  |  |
| --- | --- |
| **Functional**  **Reliability** | **End Users** |
| Q1 | Agree |
| Q2 | Agree |
| Q3 | Agree |
| Q4 | Agree |
| Q5 | Agree |

Table 3 In Q1, the researchers received evaluations of 65% (A) and 35% (D) with the weighted mean of 3.3 it shows that majority of the users believe that the system meet reliability under normal operation. In Q2, the researchers received evaluations of 15% (SA) and 85% (A) with the weighted mean of 4.5 it shows that majority of the users strongly agree that the system is operational and accessible when needed and accessible when using it. In Q3, the researchers received evaluations of 15% (SA) and 85% (A) with the weighted mean of 3.9 it shows that majority of the users strongly agree that the system can function as intended despite the presence of hardware or software. In Q4, the researchers received evaluations of 100% (A) with the weighted mean of 4.0 it shows that all users agree that the system could restore data and establish the ideal state for improvement in the event of an interruption or failure. In Q5, the researchers received evaluations of 25% (SA) and 75% (A) with the weighted mean of 4.2 it shows that majority of the users strongly agree that changes or updates to the system's data do not lead to confusion or mistakes in

Table 4. Mean for the Assessment of Users under the Category of Efficiency

|  |  |
| --- | --- |
| **Functional**  **Efficiency** | **End Users** |
| Q1 | Agree |
| Q2 | Agree |
| Q3 | Agree |
| Q4 | Strongly Agree |

Table 4 In Q1, researchers received evaluations of 50% (SA) and 50% (A) with the weighted mean of 4.5 it shows that majority of the overall users strongly agreed that data changes or updates didn't lead to inventory management confusion or errors. In Q2, the researchers received evaluations of both 50% (SA) and (A) with the weighted mean of 4.0 it shows that the overall users agree that the system's resource allocation (amount and type) meet the requirements. In Q3, the researchers received evaluations of 30% (SA) and 70% (A) with the weighted mean of 4.3 it shows that the majority of the users agreed that the system parameter limits meet the requirements. In Q4, the researchers received evaluations of 75% (SA) and 25% (A) with the weighted mean of 4.7 it shows that majority of the users strongly agreed that the system helps prevent errors and rework.

Table5. Mean for the Assessment of Users under the Category of Usability

|  |  |
| --- | --- |
| **Functional Usability** | **End Users** |
| Q1 | Strongly Agree |
| Q2 | Agree |
| Q3 | Strongly Agree |
| Q4 | Strongly Agree |
| Q5 | Strongly Agree |
| Q6 | Strongly Agree |

Table 5 In Q1, the researchers received evaluations of 100% (SA) with the weighted mean of 5.0 it shows that all users strongly agree that the system is easy to navigate and find the functions and features it need. In Q2, researchers received evaluations of 25% (SA) and 75% (A) with the weighted mean of 4.2 it shows that majority of the overall users agreed that it is easy to check the current status of items in the inventory using the system. In Q3, the researchers received evaluations of 100% (SA) with the weighted mean of 5.0 it shows that all users strongly agree that the system offers a variety of useful reports. In Q4, the researchers received evaluations of 90% (SA) and 10% (A) with the weighted mean of 4.9 it shows that majority of the overall users strongly agree that the system displayed graph is simple and easy to understand. In Q5, the researchers received evaluations of 100% (SA) with the weighted mean of 5.0 it shows that all users strongly agree that the graphs displayed by the system are simple to understand. In Q6, the researchers received evaluations of 85% (SA) and 15% (A) with the weighted mean of 4.8 it shows that majority of the users strongly agreed that the system's user- friendly interface makes it easy to navigate and use.

Table 6. Mean for the Assessment of Users under the Category of Acceptance

|  |  |
| --- | --- |
| **Functional Acceptance** | **End Users** |
| Q1 | Agree |
| Q2 | Agree |
| Q3 | Agree |
| Q4 | Strongly Agree |
| Q5 | Agree |

Table 6 In Q1, researchers received evaluations from 25% (SA) and 75% (A) with the weighted mean of 4.2 it shows that the majority of the overall users agree that the system is easy to navigate, even for beginners. In Q2, the researchers received evaluations of 100% (A) with the weighted mean of 4.0 it shows that all users agree that the system's forecasting feature needs an improvement for better predicting product demand. In Q3, researchers received evaluations from 25% (SA) and 75% (A) with the weighted mean of 4.2 it shows that majority of the overall users agree that the system helps them meet customer demand and avoid stock outs. In Q4, the researchers received evaluations of both 50% (SA) and 50% (A) with the weighted mean of 4.5 it shows that half of the users strongly agree and satisfied with the implementation and performance of the system. In Q5, researchers received evaluations from all users 100% (A) with the weighted mean of 4.0 it shows that all users agree that they acknowledged the current functionalities, they unanimously expressed a desire for further improvement in the system's inventory tracking and management.

Table7. Mean for the Assessment of Users under the Category of Security

|  |  |
| --- | --- |
| **Functional Suitability** | **End Users** |
| Q1 | Strongly Agree |
| Q2 | Strongly Agree |
| Q3 | Strongly Agree |
| Q4 | Strongly Agree |

Table 7. In Q1, researchers received evaluations from all users 100% (SA) with the weighted mean of 5.0 it shows that the overall users strongly agree that the system's login/authentication process is secure and trustworthy. In Q2, the researchers received evaluations of 65% (SA) and 35% (A) with the weighted mean of 4.6 it shows that majority of the overall users strongly agree that the system adequately protects my data and information from unauthorized access. Q3, researchers received evaluations from all users 100% (SA) with the weighted mean of 4.0 it shows that the overall users agree that the system's login/authentication process is secure and trustworthy. In Q4, the researchers received evaluations of 40% (SA) and 60% (A) with the weighted mean of 4.4 it shows that the majority of the overall users agree that the system can notify promptly of any unusual or suspicious activities.

Table 8. Mean for the Assessment of Web Experts under the Category of Design

|  |  |
| --- | --- |
| **Functional Suitability** | **Web Experts** |
| Q1 | Agree |
| Q2 | Agree |
| Q3 | Agree |

Table 8. In Q1. The researchers received evaluations of 40% (SA) and 60% (A) with the weighted mean of 4.4 it shows that the majority of the web expert agree that the inventory management system is visually appealing. In Q2. The researchers conducted a survey and received evaluations of 20% (SA) and 80% (A) with the weighted mean of 4.2 it shows that the majority of the web experts agreed that the system provides clear and easy-to-understand instructions for the user. In Q3. The researchers conducted and received the evaluations with a 100% (A) with the weighted mean of 4.0 it shows that all of the web expert agree that the system provides a user interface and easy access to the necessary features for inventory management. In overall, a moderate level of design across the assessed criteria is found in Table 8 for the assessment of the web expert with an overall mean under the category of design with a score of 4.2%. The highest score of 5.0%. It indicates that certain aspects within the design category have shown exemplary, which may serve as a benchmark for improvement in other areas. Overall, these findings indicate a generally good system design with specific areas showing potential for optimization and improvements.

Table 9. Mean for the Assessment of Web Experts under the Category of Functionality

|  |  |
| --- | --- |
| **Functionality** | **Web Experts** |
| Q1 | Strongly Agree |
| Q2 | Agree |
| Q3 | Agree |
| Q4 | Agree |
| Q5 | Strongly Agree |
| Q6 | Strongly Agree |

Table 9. In Q1. The researchers conducted a survey and received evaluations with 100% SA with the weighted mean of 5.0 it shows that all of the web expert strongly agree that the system provides data management features such as add, edit, delete, and search. In Q2. The researchers conducted a survey and received evaluations of 50% (SA) and 50% (A) with the weighted mean of 4.5 it shows that half of the overall web expert strongly agree and agree that the system provides the status of all incoming inventory items. In Q3. The researchers conducted a survey and received evaluations of 10% (SA) and 90% (A) with the weighted mean of 4.1 it shows that majority of the web expert agree that the system can notify the user about the stock level.

Table10. Mean for the Assessment of Web Experts under the Category of Performance

|  |  |
| --- | --- |
| **Functional Performance** | **Web Experts** |
| Q1 | Agree |
| Q2 | Agree |

Table 10. In Q1. The researchers conducted a survey and received evaluations of 80% (A) and 20% (D) with the weighted mean of 3.6 it shows that majority of the web expert agree that the system performs as expected in terms of speed and responsiveness. In Q2. The researchers conducted a survey and received evaluations with a 100% (A) with the weighted mean of 4.0 it shows that all of the web expert agree that the system can manage inventory data without experiencing any lag.

Table11. Mean for the Assessment of Web Experts under the Category of Compliance

|  |  |
| --- | --- |
| **Functional Compliance** | **Web Experts** |
| Q1 | Strongly Agree |
| Q2 | Agree |
| Q3 | Agree |
| Q4 | Agree |

Table 11. In Q1. The researchers conducted a survey and received evaluations with 100% SA with the weighted mean of 5.0 it shows that all of the web expert strongly agree that the system provides accurate inventory reports. InQ2. The researchers conducted a survey and received evaluations of 50% (SA) and 50% (A) with the weighted mean of 4.5 it shows that half of the web expert strongly agree that there is a clear process for identifying compliance issues related to inventory management. In Q3. The researchers conducted a survey and received evaluations of 30% (SA) and 70% (A) with the weighted mean of 4.3 it shows that majority of the web expert agree that the system is flexible and can be easily modified to meet changing needs. InQ4. The researchers conducted a survey and received evaluations of 30% (SA) and 70% (A) with the weighted mean of 4.5 it shows that half of the web expert strongly agree that the system provides a demand forecasting report. In Q5. The researchers conducted a survey and received evaluations of 50% (SA) and 50% (A) with the weighted mean of 4.5 it shows that half of the web expert strongly agree that the data privacy and security of the system are compliant with relevant laws and best practices

Table 12. Mean for the Assessment of Web Experts under the Category of Security and Data

|  |  |
| --- | --- |
| **Functional Security and Data** | **Web Experts** |
| Q1 | Agree |
| Q2 | Agree |
| Q3 | Strongly Agree |
| Q4 | Agree |
| Q5 | Agree |

Table 12 In Q1. The researchers conducted a survey and received evaluations with a 100% (A) with the weighted mean of 5.0 it shows that all of the web expert strongly agree that the system ensures the confidentiality of sensitive data by auditing data access and changes. In Q2. The researchers conducted a survey and received evaluations of 50% (SA) and 50% (A) with the weighted mean of 4.5 it shows that half of the overall number of the web expert respondents strongly agree that the system is regularly monitored in order to detect and address security flaws. In Q3. The researchers conducted a survey and received evaluations with 100% SA with the weighted mean of 5.0 it shows that all of the web expert strongly agree that user access to sensitive data is restricted based on roles and permissions. In Q4. The researchers conducted a survey and received evaluations of 30% (SA) and 70% (A) with the weighted mean of 4.3 it shows that majority of the web expert agree that the system requires strong, unique passwords and enforces password complexity. Q5. The researchers conducted a survey and received evaluations of 50% (SA) and 50% (A) with the weighted mean of 4.5 it shows that half of the overall number of web expert respondents strongly agree that the privacy policies are clearly communicated to users, and consent is obtained for data processing.

Table13. The Summary Table of the Mean in the Level of Acceptability of the End Users

|  |  |
| --- | --- |
| **Category** | **end user** |
| Functionality | 4.6 |
| Reliability | 3.9 |
| Efficiency | 4.4 |
| Usability | 4.8 |
| Acceptance | 4.2 |
| Security | 4.5 |
| Overall Mean | 4.4 |

Table 13. In summary, a high level of user satisfaction with the system evaluated can be seen in the overall mean value for data from various categories. functionality with 4.6, reliability with 3.9, efficiency with 4.4, usability with 4.8, acceptance with 4.2, and security with 4.5. The system shows strong performance across key dimensions, demonstrating its reliability, efficiency, acceptance, and security, with an overall mean of 4.4.

Table14. The Summary Table of the Mean in the Level of Acceptability of the Web Experts

|  |  |
| --- | --- |
| **Category** | **WEB EXPERT** |
| Design | 4.2 |
| Functionality | 4.6 |
| Performance | 3.8 |
| Scalability | 3.4 |
| Compliance | 4.6 |
| Security and Data | 4.4 |
| Overall Mean | 4.1 |

Table 14. In summary, a high level of web expert satisfaction with the system evaluated can be seen in the overall mean value for data from various categories. In the design with 4.2, functionality with 4.6, performance with 3.8, scalability with 3.4, compliance with 4.6, security and data with 4.4. The system shows strong performance across key dimensions, demonstrating its design, functionality, performance, scalability, compliance, security and data, with

1. Conclusions

Following the development and testing of the created system titled "Inventory Management System with Forecasting for Triple J Savers Mart" The researcher discovered that the system was capable of providing accurate data in the store

Based from the summary of finding, the following were concluded:

1. Employees at Triple J Savers Mart physically count and record inventory levels. They use spreadsheets to record item quantities and any changes. It entails going through each item in stock step by step. And it takes more time and effort to use that method.
2. By implementing an inventory management system can significantly increase the efficiency and productivity of a business. Product expiration dates are alerted in real time, ensuring that perishable items are used or sold before they expire, reducing waste and financial losses. Automated report generation enables informed decision-making by providing valuable insights into inventory levels, trends, and sales performance. This inventory management system enables businesses to optimize their operations, increase profitability, and gain a competitive advantage by combining these powerful features
3. The web experts' summary findings of the overall mean of the data in this table. The overall mean indicates that it fell into the category of agree, indicating that web experts are in agreement about the acceptability of the web-based system
4. End-users are the summary findings of the overall mean of the data in this table. The overall mean indicates that it fell under the category of agree, indicating that end users agree with the level of acceptability of the web-based system.
5. Recommendations

The researchers strongly recommend the following based on their findings and conclusions.

1. The researcher strongly advises Triple J Saver's Mart to implement an Inventory Management System with Forecasting. By forecasting demand, Triple J Savers Mart will be able to optimize inventory levels, avoid stock outs and overstocking, and ultimately improve customer satisfaction. Furthermore, by providing real-time alerts for product expiration dates, proactive inventory management will be enabled, along with other system features that will assist the business in managing and meeting the demand of the daily operations of the business more efficiently.
2. The researchers recommend that generated reports be reviewed and analyzed on a regular basis in order to identify trends, track product performance, and optimize inventory levels. Use insights to inform strategic purchasing, marketing, and pricing decisions
3. The researcher recommends that it is critical to keep users informed and proficient in data entry and inventory management, system reporting and analysis, security and access controls by regularly updating training materials and incorporating new features into the training program. Triple J Savers Mart can ensure the system's effective utilization by investing in user training, resulting in improved inventory management, improved forecasting accuracy, and, ultimately, increased profitability

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