

# **INVENTORY MANAGEMENT SYSTEM FOR RETAILERS**

## **LITERATURE SURVEY**

**DOMAIN NAME:** CLOUD APP DEVELOPMENT

**TEAM ID:** PNT2022TMID29529

**BATCH:** B7 - 1A3E

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### **PAPER 1: Cloud-Based Inventory System for Effective Management of Under and Over-stock Hazards**

**Published year:** June 2021

**Author:** Rashidah Olanrewaju

**Journal name:** 8th International Conference on Computer and Communication Engineering (ICCCE)

**Summary:** Inventory can be defined as the goods and materials used by the organization for the sake of manufacturing and sales, including the items to support all the processes. A good inventory system management can increase the efficiency of operations, reduce cost, and maximize profit. Hence, led to the automation of all the manual tasks and finally please the customer of the organization. The cloud-based computerized inventory system is proposed with the integration of a barcode scanner to replace the usage of manual and paper-based systems. The interface is developed using Hypertext Markup Language, JavaScript, and Cascading Style Sheet while the backend database is coded. It is undeniable that the manual inventory system needs to be changed to an automated inventory system that can reduce the time taken, reduce human error, and improve the efficiency of the inventory using My Structured Query Language.

**Methodology used:** Cloud app development

**PAPER 2: An Intelligent Model for Sales and Inventory Management**

**Published year:** October 2011

**Author:** Sylvanus Anigbogu

**Journal Name:** Indian Journal of Computer Science and Engineering (IJCSE)

**Summary:** This work involved developing an intelligent model for sales and inventory management aimed at bridging the substantial gap between the theory and the practice of inventory management. The system developed has the capability of providing automatic demand and lead time pattern identification for inventory management. The intelligent inventory model was formulated using the concept of fuzzy logic. Inventory is the stock of some kind of physical commodity. Inventory can also be seen as the number of products that a merchandising firm has available to sell at any given time. The inventory management system again monitors the quantity of each product available for sale and helps to ensure that proper stock levels are maintained.

**Methodology used:** Fuzzy model

**PAPER 3: Optimal control of manufacturing processes in Hybrid Inventory-Production systems**

**Published Year:** August 2009

**Author:** David Giglio

**Journal Name:** ECC '09, European Control Conference

**Summary:** In this paper, we propose a hybrid modeling framework concerning a production plant. The considered model is defined as the Hybrid Inventory-Production (HIP) model since it is used to represent a manufacturing system considering two inventories, one for raw parts and the other one for processed parts, such that the transfer between them is realized by the production process. It is possible to find several works about hybrid systems, describing how to manage the interaction between continuous and discrete aspects. In those works, the authors emphasize the idea that the design of controllers for hybrid

systems requires new techniques and methodologies which are not simple extensions of those applied to continuous or discrete systems.

**Methodology Used:** HIP model

#### **PAPER 4: Inventory management for retail companies**

**Published Year:** 1 March 2021

**Author:** Cinthya Vanessa Muñoz Macas

**Journal Name:** 2021 Second International Conference on Information Systems and Software Technologies (ICI2ST)

**Summary:** In recent years, the correct management of inventories has become a fundamental pillar for achieving success in enterprises. This article aims to analyze and present extensive literature concerning inventory management, containing multiple definitions and fundamental concepts for the retail sector. A systematic literature review was carried out to determine the main trends and indicators of inventory management in Small and Medium-sized Enterprises (SMEs). The primary outcomes of this study are the leading inventory management systems and models, the Key Performance Indicators (KPIs) for their correct management, and the benefits and challenges of choosing or adopting an efficient inventory control and management system. Findings indicate that SMEs do not invest resources in the sophisticated system instead, a simple Enterprise Resource Planning (ERP) system or even programs such as Excel or manual inventories are mainly used.

**Methodology Used:** ERP system, Excel

#### **PAPER 5: Asynchronous regulation of service speed in inventory-production systems with time-varying positive demand**

**Published Year:** December 2011

**Author:** Silvia Siri

**Journal Name:** Decision and Control and European Control Conference (CDC-ECC), 2011 50th IEEE Conference

**Summary:** This paper deals with an inventory-production system in which raw parts are transformed into processed parts, in order to satisfy a time-varying positive demand over a given time horizon. The production resource is

capacitated whereas the inventory is unbounded; the external demand is known and is a piecewise constant function changing at asynchronous time instants. The objective is to find the optimal service speed pattern, assumed to be a piecewise constant function, which minimizes setup, production, and holding costs; hence, the decisions concern both the values of the service speed and the (asynchronous) time instants in which it changes. The optimization problem defined for this system has a parametric structure and includes both nonlinear and combinatorial aspects. Some structural properties of the optimal solution are firstly proven, and then a solution procedure that allows to find the optimal solution in polynomial times is provided.

**Methodology Used:** Cloud app development

## **PAPER 6: A Cloud-Based Retail Management System**

**Published Year:** March 2015

**Author:** Adewole Adewumi

**Journal Name:** International Conference on Soft Computing, Intelligence Systems, and Information Technology

**Summary:** Retail management systems have been deployed extensively as web applications and stand-alone systems. However, in order to maximize return on investment while also improving retail business efficiency and performance, it is imperative to explore newer technologies that can be leveraged. Cloud computing shows great potential in this regard, and so it is our aim in this paper to develop a cloud-based retail management system. We realize this by first designing the framework of the system and then implementing it. Cloud computing represents a radical change in the way information technology (IT) services are offered to the public. Its concept relies on sharing computing resources rather than owning local servers in order to handle applications. It can be implemented under three major service models namely: Software as a service (SaaS), Platform as a Service (PaaS), and infrastructure as a Service (IaaS). They can be deployed as private clouds, public clouds, community clouds, or hybrid clouds.

**Methodology Used:** Cloud Computing

## **PAPER 7: Reconstructing inventory management theory**

**Published Year:** June 2006

**Author:** Geoff Buxey

**Journal Name:** International Journal of Operations and Production Management

**Summary:** This paper sets out to discuss practical inventory control systems. The orthodox theory revolves around the purchaser and balances ordering costs against charges for carrying goods in stock. However, for any company holding thousands of different items the directives for constructing the best system(s) are confusing and the logic seems inconsistent. This paper is to clarify this hitherto unsatisfactory situation and to provide robust guidelines for managing such inventories. The myopic standpoint of established models neglects the impact of various ordering policies at the supplier's end, where the promotion of cost-effective and responsive warehouse and transport operations is paramount. As a rule, both areas benefit from stable resource planning, based on cyclic orders and delivery schedules along with fixed vehicle routes. This paper provides a new perspective on stock control that brings theory into line with modern supply chain management concepts.

**Methodology used:** Cloud app development

**PAPER 8: Design of smart inventory management system for constructing sector based on IoT and cloud computing.**

**Published Year:** August 2002

**Author:** Rajesh Bose

**Journal Name:** E-Prime – Advances in Electrical Engineering, Electronics, and Energy

**Summary:** Monitoring and managing the consumption of raw materials and goods in any manufacturing industry is considered a vital activity to operational sustainability and profitability. Given the current state of global competition, manufacturing industries are almost always on the lookout for an inventory management system that would help curtail costs and reduce the time required to supply raw materials and goods to carry out properly and efficiently. It is, therefore, of paramount importance that continuous improvements are carried out on existing inventory management designs to stay relevant. While modern inventory management systems have benefitted greatly from barcodes, our research reveals that there could be an opportunity to approach barcode-based designs by amalgamating such with Cloud Computing, Arduino-based wireless station nodes, IoT, and a secure form channel to access

data through a dedicated web portal. In this paper, we propose a novel approach using our model and show how this can help the construction sector in managing the inventory of essential formwork shuttering products. Although the background of our research is related to Indian construction companies, the results of our study can be extended to other regions as well.

**Methodology used:** Cloud computing, IoT, Arduino-based wireless station nodes.

## **PAPER 9: Inventory Management System for Warehouse**

**Published Year:** June 2019

**Author:** Prof. Dr. Sagar B. Tambe

**Journal Name:** International Research Journal of Engineering and Technology (IRJET)

**Summary:** A proposed Inventory Management system that is used in the industry provides automation, efficiency, and convenience in everyday life. An enterprise has a variety of components that are used by employees for routine activities. Keeping track of these components becomes problematic wherein the components might go missing at the hands of employees. To remedy this, various types of technologies like a Bar-code Scanner or RFID (Radio-frequency Identification) based on the Tracking Component system are developed for providing automation, withdrawing the components, and keeping better track of them. In this system, we can maintain login sessions for an authorized person which are tracked by using RFID tags. The components are tracked when they get in range of RFID Reader to scan RFID tags. When a person withdraws the components, the system maintains a record of them. If any employee fails to return the component, it goes under the pending state. If any component illegally crossed exit doors then the system generates an alarm and also displays a shortage of component warning, the number of available components and required components are to be displayed enabling automated inventory management with minimal manual intervention. We are also incorporating machine learning which will help us understand the product ratings i.e. which products are used more etc. Using machine learning with RFID tags will make the system more efficient and profitable as it will generate demand for the products on its own. The data will be stored in the cloud which will make it accessible from anywhere remotely. The data can also be viewed on mobile using the cloud.

**Methodology used:** Bar-code Scanner or Radio Frequency Identification

**PAPER 10: A Web-based Inventory Control System using Cloud Architecture and Barcode Technology for Zambia Air Force**

**Published Year:** January 2017

**Author:** Thomas Muyumba

**Journal Name:** International Journal of Advanced Computer Science and Applications

**Summary:** Inventory management of spares is one of the activities Zambia Air Force (ZAF) undertakes to ensure optimal serviceability state of equipment to effectively achieve its roles. This obligation could only be made possible by automating the current manual and paper-based inventory system. A web-based inventory management system using cloud architecture and barcode technology was proposed. A literature review was conducted on three technologies used in inventory management that is Radio Frequency Identification (RFID), Barcode Technology, and Near Field Communication (NFC). A review was also undertaken on the related works to identify the concept that could be adopted in the proposed system. A baseline study was performed to understand the challenges faced by ZAF in the inventory management of spares. The results of the baseline study were analyzed and found that the challenges were attributed to the current manual inventory management system mainly due to human errors, incorrect inventory reporting, and pilferage of items. The proposed prototype system was developed and tested and proved to be faster, more efficient, and more reliable than the manual and paper-based system.

**Methodology used:** Web-based Application, Bar code technology