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CLOUD-BASED SOLUTION FOR REAL-TIME INVENTORY TRACKING AND MANAGEMENT

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ABSTRACT

Numerous organizations struggle to sustain optimal stock levels for MRO inventory. The inflexible framework of conventional inventory management systems fails to furnish organizations with real-time data regarding their inventory levels, potentially detrimentally affecting their overall productivity. The escalating operational costs associated with personnel, rectification of errors, and maintenance of inventory control systems are persistent issues for businesses. Cloud computing can enhance inventory management and resolve numerous challenges encountered in the sector. In addition to seamless updates, cloud computing providers operate behind the scenes to ensure optimal performance and are generally available to address inquiries or provide assistance upon request. Furthermore, additional personnel or specialized hardware are unnecessary on cloud platforms. Most cloud enterprises do not require specialized training for staff to utilize the new product, thus the platform's learning curve has been streamlined, enabling immediate recognition and usage from the first day. The system was developed utilizing the Object-Oriented Design methodology, with the Unified Modeling Language (UML) employed for system modeling. The application was developed with Django and is hosted on Google App Engine, utilizing Google Cloud SQL for database management and Google Cloud Storage for file storage. This paper documents the research on the enhancement of Inventory Management Systems through Cloud Computing and the deployment of a cloud-based inventory management system for Maintenance, Repair, and Operating (MRO) inventory items.

Keywords: cloud computing, inventory management.

I. INTRODUCTION

Users can access storage, files, software, and servers via their internet-connected devices, such as computers, smartphones, tablets, and wearables, thanks to cloud computing technology. Cloud computing service providers store and process data in a separate location from end users. Cloud computing essentially refers to the ability to store and access data and programmes over the internet rather than on a hard drive. This means that businesses of any size can use powerful software and IT infrastructure to grow bigger, leaner, and more agile, and compete with much larger companies. Unlike traditional hardware and software, cloud computing enables businesses to stay on the cutting edge of technology without having to invest heavily in purchasing, maintaining, and servicing equipment.

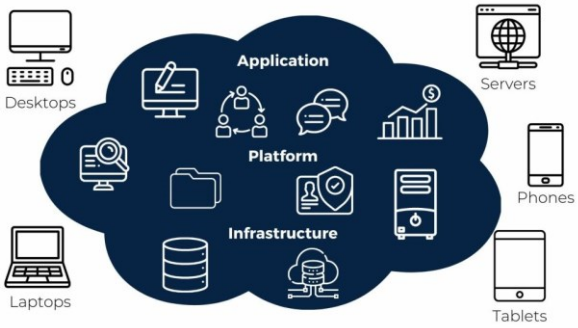

Fig.1 Cloud Based Inventory Management System

The Inventory Management System assists us in streamlining the logistical management of our products and automates a number of operations like purchasing, ordering, pricing, storing, putting together, shipping, and delivery. Additionally, it eliminates the need for human labour while increasing productivity, lowering expenses,

and saving time. It offers helpful insights to assist you hasten the success of your firm. For any firm, it's crucial to maintain the correct amount of inventory. It requires a lot of time, labour, and effort to trace the assets from storage, warehousing, dealing, transportation, and organisation. Therefore, a cloud-based inventory management system aims to save costs, boost capital efficiency, and enhance customer satisfaction, which has a positive impact on the supply chain in terms of operational effectiveness and cost-saving. Although there are concerns about cloud security, it is also true that the cloud has been protected by network security specialists to safeguard our data from catastrophic breaches. By transitioning to cloud-based inventory management, we can feel secure knowing that our data is safe behind a wall of data protection solutions and procedures while yet being immediately accessible to those who need it.

II. LITERATURE REVIEW

Rahmayanti & Fauzan (2016) and Candra (2019)[1] conducted research about inventory problems resulting in overstocks on some goods and shortage of stock in other goods. They used the method which is done by doing forecasts calculations. The purpose of their research is to find available inventory space and to determine the maximum usable inventory. Budiharjo & Hadikurniawati (2020)[2] and Kartikasari & Suhartono (2013) who used historical data to process data to be processed further. Both studies have similarities using the forecasting method in their research. This research aims to forecast future order demand. This method is also believed to be an indicator to measure success in selling and offering the products that the companies researched. Al-Husaini et al. (2018)[3] used sales data for data processing. In this study, the forecasting method to solve company problems carefully was used. However, the final output produced is an information system that will make it easier for companies to apply the forecast data Alfredo (2015)[4] focused more on the EOQ, ROP method and also the determination of safety stock. Objectives of this study were used to implement a new and good inventory system in the object research company. With this implementation, it is believed that it will increase the company's inventory performance, sales productivity, and cost-efficiency. Nisa (2019)[5] studied hospitals that had problems with expired drugs. Data processing requires several data such as demands, order cost, and storage cost in this study. She used the ABC, EOQ, and ROP methods for data processing. This research aims to identify and analyze drug grouping based on the ABC method, the optimum amount of drug ordering using the EOQ method, and the time of reordering medicine using the ROP method.

III. METHODOLOGY

Rational Unified Process is the methodology employed in this system. It is a software development process for object- oriented models. It is also known as the Unified Process Model. It enables us to respond to changing requirements, whether they come from the client or the project itself. It emphasises the importance of detailed documentation. It necessitates integration at all stages of software development, but particularly during the building stage. This methodology is divided into four phases. It consists of four stages: inception, elaboration, construction, and transition. These four phases primarily cover significant use cases, the project's scope, initial costing, the development process, including the depth and breadth of prototype success criteria, risks involved, coding, testing, and debugging. The primary goal is thus to build a software system, followed by a systematic "transition" from development to production or application. Upkeep and beta testing are also critical components of this system. The amount of time required for development is also significantly reduced by reusing software components. It also accelerates backend integration. This methodology ensures the stability and adaptability of the system's main applications.

IV. RESULT AND DISCUSSION

In this Study, a Cloud based Inventory Management System is being developed that would make the Inventory Management processes easily accessible to all its users. Due to its cloud based efficiency, it will give users a hassle-free and secured access from anywhere around the globe. It guarantees a secure, dependable inventory supply for individuals who require it. It will make the efficiency of work processes and output at ease. Effective cloud-based inventory management should be able to relay real-time operation, i.e., Order execution, selling process and dispatch of the goods to the customer. It will manage inventory information such as sales, purchases, and stock balance information The use of this system will lessen the amount of manual effort required to manage inventories and can be accessed from anywhere and at anytime due to its cloud based efficiency. It will make the inventory manageable and streamline the organization's utilisation of inventory. Using it will give us less dependency on manual systems resulting in error- free and hassle-free user experience. The automated system will give convenient inventory updates on a regular basis. Users opting in for the cloud based Inventory Management System will have its anytime and anywhere access. Inventory Management System is a system designed for maintaining the records of the inventories. Sales produce profits, and sales require inventories. Negligent inventory management leads to excess inventory, which lowers return on investment and affects the cash conversion cycle. When managing inventory, it is crucial to consider the things that should receive more

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attention based on sales success. Considering the expenses incurred for repairs, orders, and shipments as well as the shortages in inventory and deterioration brought on by poor management.

V. CONCLUSION

Most of the existing systems are quite expensive in terms of its use and access so, this cloud based Inventory Management system will be a cost-effective option for the customers opting in for the cloud based Inventory Management System. The existing systems also have a complex user interface which makes it difficult for the customers while accessing it. So, this system will be made in the context that its interface should be user-friendly such that the customers feel convenience while working in the Inventory Management System. Although there are concerns about cloud security, it is also true that the cloud has been protected by network security specialists to safeguard our data from catastrophic breaches.

By transitioning to cloud-based inventory management, we can feel secure knowing that our data is safe behind a wall of data protection solutions and procedures while yet being immediately accessible to those who need it. One of the primary benefits of a cloud-based Inventory Management System is removal of dependency on the manual systems which will result in faster and efficient management of inventories. The organizations opting in for the cloud-based Inventory Management System will not be facing any mistakes done in as the manual systems which will make it more compatible as compared to the outdated manual systems resulting in less labour costs and better efficiency. It will be a cost saving and time saving option as everyone wants to get their work done at the earliest. Users need not worry about their data on the cloud platform as it is more secured compared to the manual systems. The cloud platform is being watched and monitored by security analysts on a regular basis and these platforms tend to be more secured for the users as compared to the manual systems.

This system provides you with greater flexibility and connectivity, as well as the ability to assist your clients more effectively even when you are not physically present.

REFERENCES

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