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Web-based Management for Fire Fighting Equipments

Priyanka Gonnade

#Assistant Professor, Computer Science and Engineering
G H Raisoni Institute of Engineering and Technology Nagpur, India
priyanka.gonnade@raisoni.net

ABSTRACT

Firefighting equipment companies have been selling their products in bulks, these transactions are complex and require human labor to maintain the quality, stocks and sales report. Without proper management the stocks may run out and the retailer won't even know. With the introduction of new technologies, the problem of manually managing inventory and records can be overcome. This system focuses on efficiently reducing human error often encountered while managing products. It provides an interface to connect the supplier and the client. It can be used to create work orders and bills of equipment in the inventory. It tracks and maintains a smooth flow of supplies, installation and maintenance of equipment, alerts the supplier before the stock is about to end so that the supplier can replenish the stock. The system will be much faster than the conventional method i.e. keeping the records by hand. The system provides an interface to connect the supplier and the client, which would help the clients to get in touch with the supplier to directly enquire and place orders with the company. This can be used to create work orders and bills of materials.

Keywords— Fire-Fighting, Inventory Management

I. INTRODUCTION

Sales and Management of Fire Fighting Systems is the process of overseeing and controlling the flow of inventory units a business uses in the production or manufacture of goods for sale or distribution. Inventories in Sales and Management of Fire Fighting Systems are usually made up of a combination of quotation, purchase order, stock report market wise, account statement, supplier wise GST and effective management of these items is essential to ensure optimal stock levels and to maximize the earning potential of the company. It also allows a business to prevent or mitigate any inventory-associated losses.

More and more fire supplier departments are looking for an effective way to track their supplies. Lot of them use an Excel spreadsheet or simply "a Big Chief tablet and a number 2 pencil". Without proper inventory management of equipment, it may run out of crucial stock or it overstock items, which wastes money.In order to run streamlined activities, it is mandatory to resort to a robust system for fire safety supplier inventory management. For reducing manpower and automating sales and installation of fire fighting equipment, companies tend to opt for a web-based management system.

II. LITERATURE REVIEW

In [1], most Peruvian SMEs are developing in the casual area, along these lines they neglect to build up their procedures effectively or to have sufficient stock administration. This has become a basic factor for their improvement, causing both financial and basic issues. Then again, there is an absence of research on stock administration in administration organizations. Along these lines, a model is proposed for dealing with the inventories of administration organizations in the mechanical hardware rental segment dependent on the Sales Operation Planning (S&OP) device. This model depends on a development model permitting the organization to assess its present circumstance and recognize the vital prerequisites to have the option to scale up S&OP improvement in the organization. The proposed model was implemented for a situation concentrate in Lima-Peru where the outcomes got show that the stock administration was significantly improved, accomplishing a satisfactory S&OP level. Thus, this model turns into a high worth instrument that uncovers the activities expected to arrive at the perfect S&OP level.

In [2], the point of this work is to introduce the information mining methods for grouping stock keeping units to ABC order in save parts distribution center in an industrial facility of Thailand. ABC examination is a "stock arrangement strategy" that isolate things into three classes (A, B, and C), which are the name of information. The information was gathered from SAP stock administration in the time of 2015- 2019. There were absolutely 21,222 occurrences and 28 properties. The dataset is handled with five famous gatherings systems including Random forest, Bagging, Adaboost, Dagging and Decorate. The aftereffects of this examination give knowledge into systems for precisely grouping ABC classification for stock the executives, look at the exactness, review, f-measure and precision of five group calculations that can be conveyed to the stock procedure for the production line

In [3], this exploration endeavoured to build up a stock the board framework for an adaptable printed circuit board producer in Thailand. The advancement started with an examination of the current stock framework, which found that the framework was very insufficient making organizations face significant issues especially an unnecessary stock. The ABC investigation utilizing a different criteria stock characterization for the stock control framework was at first applied to distinguish the most significant things. The fundamental targets are to centre the proficient determining system under stochastic interest and the presentation of fixed renewal amount strategy to decrease the general stock related expense. In the execution process, the proposed framework was thought about with the present framework. The investigation indicated that all out-reserve funds from executing the (R, Q) strategy to all materials roughly 262.03 million baht of the all-out stock expense.

In [4], the paper presents a two-echelon stock transportation issue in Vendor Managed Stock (VMI) system. We consider a dispersion framework made with single provider, single dissemination focus and various retailers. Single sort of items is required to convey from the maker through circulation focus to the retailers inside delicate time window. The target of the issue is to limit absolute coordination's cost in the conveyance arrange, including stock cost, appropriation cost, and time punishment cost.

The more elite class model spotlights on limiting stock expense while the lower echelon model on vehicle directing issue. A blended calculation is intended to take care of the issue with mimicked strengthening and insect province with nearby hunt. The arrangement of upper and lower echelon model is subbed into one another in light of the blended calculation bit by bit to get the improvement arrangements. Computational investigations are executed to look at the presentation of autonomous and incorporated stock transportation enhancement from the element of to check the viability of the model and the calculations.

In [5], the stock control frameworks have a significant job to screen the state of the products at the stockpile chain phase of products dispersion from the focal distribution centre to retail as per buyer request. The exploration plans to create stock control frameworks on the inventory network conveyance of products from providers to retail through the focal stockroom with insignificant stockpile chain costs. Minimization of inventory network cost utilizing martingale model of conjecture assessment, and the outcome as the reason for computation of security stock and reorder point. The aftereffects of research are the framework that can be utilized to control stock and reestablishment of merchandise in the focal distribution centre by figuring the minimization of production network cost dependent on purchaser request. Contextual analyses were directed on the inventory network conveyance of products from the focal distribution center to the retail in Semarang. The perception information got from the products circulation from focal distribution centre to retail for specific items more than 4 timespans. Through such stock control framework, can limit store network cost, and item stock level can be kept up in time and measure of stock that must be satisfied.

In [6], Mass customization (MC), as a tasks program to meet objective clients by conferring customized items or administrations, has pulled in significant consideration from each the business what's more, scholarly world. Under this program, one among the most extreme significant issues is an effective control of the related inventories, together with the work-in-method inventories, chic things, and the hand-crafted things, which can at last make a commitment to a productive business for the associations who've propelled MC. This paper, along these lines, makes a forte of surveying the mass customization based writing and distinguishing various techniques to effectively oversee stock for MC plans. Notwithstanding standard stock the board, with the expanding accentuation on organization social responsibility, MCcompanies are required to dedicate more noteworthy endeavour to the correct control of remaining and returned inventories under MC. This paper, subsequently, looks at MC stock administration in each forward and inverse coordination. Discoveries from this survey give a core value to tasks chiefs on stock control advancement of their MC tasks. Future research openings identified with MC stock administration, for example, convey chain coordination and danger control, are talked about.

In [7], it explains that there are a few blood parts at the Blood Transfusion Unit to improve wellbeing administrations in Indonesia including Whole Blood, Packet Red Cell, Liquid Plasma, Fresh Frozen Plasma, Thrombocyte Concentrate, Kriopresipitat and Washed Erythrocyte. To offer types of assistance to purchasers, this unit faces issue as unbalance blood supply data and purchaser request. Subsequently, the executives of this unit were hard to deal with the blood stock. Points of this investigation is to assemble a data

framework model utilizing the framework advancement life cycle approach so as to oversee blood request. Moreover, this case received constant audit model to lead the stock arrangements including wellbeing stock, reorder point, and request amount on each blood segments. This study can give advantages to Blood Transfusion Unit so as to expand administration level to the client. Further study is proposed to consider blood stock recreation.

In [8], the organization has an issue identified with crude material stock. The stock can be overload or stock out. It is because of their working which is not guided by a data framework. Along these lines, this examination proposes a choice emotionally supportive network for controlling the stock of the crude material. The framework utilizes Material Prerequisite Planning (MRP) approach and is structured in three sub-frameworks. They are OLTP database for dealing with the day by day exercises, MRP for deciding the part size and the crude material requesting time, and OLAP with information distribution centre for examining the crude material information.

In [9], to upgrade the intensity of an internet business endeavour by improving the exhibition of the store network, we examined the impacts of snappy reaction (QR), horizontal transhipment (LT) on stock framework, and propose another stock control methodology by joining QR and LT. Framework elements is utilized to display the stock framework for investigating the viability of QR, LT and the proposed methodology. Numerical model shows that QR has a dazzling enhancement for satisfaction rate on the off chance that one pays greater expense, while LT could just expand the satisfaction rate marginally however keep up a lower cost. When utilizing the proposed procedure, we discovered that the new stock administration procedure can improve the satisfaction rate by acquiring the upsides of QR and LT while keeping up the minimal effort. Moreover, it has been discovered that the planning of LT may have a significant sway on the exhibition of the store network.

In [10], The Institute of Training and Research for Data and Communication Technology (BPRTIK) is an establishment under the Ministry of Communications and Data Technology (KEMKOMINFO). Since this Institution deals with its inventories by utilizing spreadsheet so the information is not synchronized appropriately and inclined duplication of information. The stock reports, for example, upkeep process reports are too done physically and are recorded in papers that have not been sorted out into a solitary database, making those reports are defenceless against a misfortune or defilement of information. What's more, the procedure of undertaking's task and observing are as yet done physically by utilizing an update or even verbally which at that point lead to the undocumented reports. Right now, information was gathered by meeting, perception and writing study. Quick Application Improvement (RAD) and Object-Oriented Approach utilizing Bound together Modelling Language (UML) were utilized as the framework improvement and structure techniques separately. The consequences of this investigation is stock administration data framework, which can bolster and deal with the stock's procedures, for example, the procedure of controlling and observing, upkeep, task what's more, detailing.

III. BLOCK DIAGRAM

Fig. 1. Block Diagram

IV. METHODOLOGY

A. ASP .NET

ASP.NET may be a framework for developing dynamic web applications. ASP.NET works on top of the HTTP protocol, and uses the HTTP commands and policies to line a browser-to-server bilateral communication and cooperation.ASP.NET may be a a part of Microsoft .Net platform. ASP.NET applications are compiled codes, written using the extensible and reusable components or objects present in .Net framework. These codes can use the whole hierarchy of classes in .Net framework.ASP.NET is employed to supply interactive, data-driven web applications over the web. It consists of an outsized number of controls like text boxes, buttons, and labels for assembling, configuring, and manipulating code to make HTML pages[11].It supports languages like VB.Net, C#, Jscript.Net, etc. important aspect of ASP.NET like reusable code, deploying the .net application on the server, testing web application, debugging then on. The programming logic and content are often developed separately in Microsoft Asp.Net.

B. MVC

The model view controller (MVC) may be a fundamental design pattern for the separation between interface logic and business logic. The model-view controller (MVC) pattern may be a method of sorting an application into three distinct components; the model, the view, and therefore the controller. during this paper, we implement MVC method in two different frameworks; the ASP.Net framework and Java server pages (JSP) framework[11]. In this project 3 - tier model is employed. 3-tier architecture has three different layers. Presentation Tier - liable for rendering the interface, Business Tier (or Logic Tier) - liable for processing the business rules or logic, Data Tier - liable for interacting with the info storage system.When the MVC and three-tier approaches are brought together the View and Controller are considered the presentation tier, the Model exists within the business tier (and has access to several business and data tier modules). To a particular extent the Model could span both the business and data tiers. it's this author view that the Model wouldn't exist within the layer of the info tier that's specifically Data Access Layer (DAL) code including SQL or code optimized for DAL within a cached environment.Some important aspects of this diagram include is that the separation of knowledge reads from writes. Writes take considerably more data storage resources than do reads, so separating these into different physical data stores can have huge benefit. It should also identify that

the modules for the business and data logic are often numerous. And these exist for maintainability and scalability purposes. it's also reasonable that the Model may access the info Tier directly without browsing a Business Tier module.

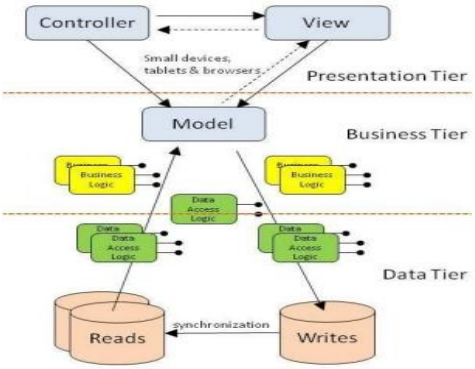

Fig. 2. MVC Architecture

C. JQUERY

JQuery may be a lightweight JavaScript library. The purpose of jQuery is to form it much easier to use JavaScript on the web site. jQuery takes tons of common tasks that need many lines of JavaScript code to accomplish, and wraps them into methods that you simply can call with one line of code. jQuery also simplifies tons of the complicated things from JavaScript, like AJAX calls and DOM manipulation.The jQuery library contains the features like HTML/DOM manipulation, CSS manipulation, HTML event methods, Effects and animations, AJAX, Utilities.

D. AJAX

AJAX stands for Asynchronous JavaScript and XML. AJAX may be a new technique for creating better, faster, and more interactive web applications with the assistance of XML, HTML, CSS, and JavaScript. Ajax uses XHTML for content, CSS for presentation, alongside Document Object Model and JavaScript for dynamic content display. Conventional web applications transmit information to and from the sever using synchronous requests. It means you fill out a form, hit submit, and obtain directed to a replacement page with new information from the server. With AJAX, once you hit submit, JavaScript will make an invitation to the server, interpret the results, and update the present screen. within the purest sense, the user would never know that anything was even transmitted to the server. A user can still use the appliance while the client program requests information from the server within the background.

E. Login Module

Login modules are used to authenticate users. It is a gateway for the users to gain access to the software. The administrator can therefore access the dashboard, keep track of users and current delivery status. Clients can enquire for equipment, print invoice, and purchase equipment.After the client login they can now do the following tasks:

i. Call company for Site Investigation

Organization that require to install fire safety system in the building or campus in their organization buildings. Demand is generated for the supply and installation for the system to the supplier. Then the company specialist visits the site and inspects the area where the actual system is to be implemented and takes the measurement of the area and records it.

ii. Purchase and Installation

Then quotation of the rates of the material required for the installation will be given to the company or organization. When the company accept the rates and other formalities of the fire safety system supplier then the work begins at the site.

F. Payments

Once all the installation is done at the site of company or organization needs to pay the final payment of the work done. Then the software designed that help to generate payment slip and other format of payment. The application also includes GST that is dependent of the type of material. All the taxes are included according to the type of material and item that are used for installation of safety system.

G. Restocking and Tracking

All the sales are kept under constant updating in the
database which also maintains a track of equipment or material remaining in the warehouse of the supplier so that when there is need of material or equipment it can be ordered and there must not be shortage of item. Fire safety system supplier inventory can contain form all small objects to large equipment that are used for installation of the system in the organization or building of the client.

H. System Architecture

In the system architecture we contain different modules on which the work is to be done and will ease the work of the company personnel who will be handling all the queries and other data a client has requested. The system contains Enquiry module, Inspection module, Invoice module, Material module and Work Order module.

I. Enquiry Module

The enquiry module contain the interface for the customer to enquire about his query for the equipment that they wish to install the system. The Enquiry Id are generated randomly for every new request from customer side. The customer needs to provide some of the basic parameters about his requirement such as No. of floor, type of Building and some contact details about his organisation.

J. Inspection Module

The inspection module contain details that are used to describe about the project whose work is to be done. The company personnel fill the details.

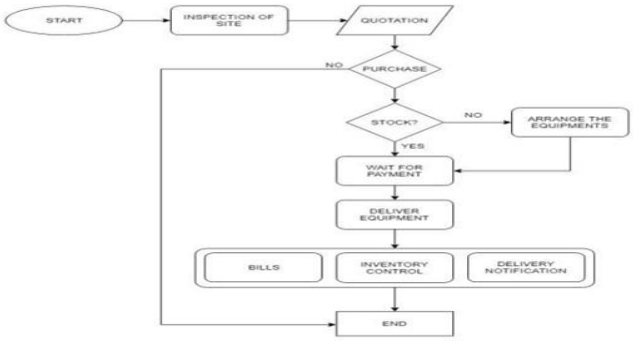

Fig. 3. Flow chart

CONCLUSIONS

Sales and Management system of fire fighting equipment tracks and manages the asset. The process controls purchasing, selling, bill generations, stock management, client's interaction and work orders. System was developed using ASP.NET MVC. MVC is a design pattern used to decouple user-interface (view), data (model), and application logic (controller).The data is stored directly onto the database which reduces the chances of data corruption.

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