Turkish Journal of Computer and Mathematics Education Vol.12 No.12 (2021), 446-453

Research Article

Design Billing Architecture for Formwork Materials in Construction Industry

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Article History: Received: 11 January 2021; Revised: 12 February 2021; Accepted: 27 March 2021; Published online: 23 May 2021

Abstract

Inventory management is one of the major problems faced by various companies. Traditional ways of billing method have various disadvantages as they were done manually therefore there were lots of chances of errors in the transaction. The error in the payment and transaction leads to the breakdown of the customer's trust and Customer Behavior Relation gets affected. The pen-paper billing techniques were time-consuming and uncomfortable for the business and can lead to various kinds of error. The development of an Inventory management system reduces the manual task and increases the automation works which results in less error and increased customer satisfaction. The billing architecture of our Inventory management system helps in building customer relationship behaviour and provides a way to grow the business. The payment, transaction and transaction history can be easily visible to the customers.

Keywords: Inventory management, billing architecture, formwork materials

Introduction

This article is about the billing architecture of the Inventory management system. Inventory management is a basic problem faced by companies. Inventory management is the most difficult task for the company when it is done with the traditional method. In this article, we will learn about the inventory management system as it is the process of tracking the products throughout the whole supply chain from buying the products to the end sell. The approach of Inventory management helps in becoming more successful. The inventory management system is needed to manage the stock in the company and also helps in maintaining customer relationship behaviour. In this article, we will see the related works and proposed work where we can see the aim of the proposed work. We will also see the proposed diagram and data flow diagram. In the proposed diagram we will the activities performed during the billing architecture. A comparison is also made with the other paper and at last result analysis is present.

Related work

The related work describes the real-time implementation of the billing architecture of inventory management systems. The related work aims to adapt to the changes in market demands. According to Du et al. (2020), the basic billing activities of the inventory management system can be effectively offered through out-of-the-box systems however, they are not flexible to accept the changes in the market conditions rapidly. Every day the customers are demanding unique payment models which will be convenient to use and fast. The proposed work will provide a Billing architecture that will be easy to adapt to the market demands and the customers can easily use the billing architecture for purchasing the products in the inventory management system.

According to Madamidola et al. (2017), billing architecture is more customizable as compared to out-of-box billing products and the architect of the billing architecture acts as a true software platform. Billing architecture models are designed in such a way that they can support all kinds of payment models. These kinds of software can be easily modified according to the changing demands in the market and users from non-coding backgrounds can also easily create the new application and support the business processes by developing innovative workflows. The revenue recognition processes can be compromised with the vast array of operations and can be easily supported through the flexible billing architecture. According to tangtisanon (2018), the inventory management system can easily adapt to the changing requirements of the market through billing architecture.

The other reason for the proposed work is to increase the speed of the inventory management system through the billing architecture software. The out-of-the-box billing products are not satisfied with the current market conditions as they don't provide agility. The billing architecture can help the inventory management system by offering a cloud base billing platform to increase speed in the market by increasing customer satisfaction by providing various payment options. According to rezwan et al. (2018), the cloud-based billing architecture for our inventory management system will provide various payment models to the customers and they also offer a variety of options to the customers. The cloud base billing architecture of the Inventory management system helps in deciding the pricing models and monetizes the various products and makes an easy and innovative billing procedure to the customers.

The proposed work determines how the financial ecosystem gets extended by using the billing architecture of our inventory management system. The older billing was a process that was done in isolation and the customers did not know the whole billing procedure. The billing architecture of the inventory management system offers the interaction of customers with the billing system. According to Nazaroy and Broner (2017), enterprise resource planning (ERP), Customer relationship management (CRM), Tax system and general ledger can interact and have proper knowledge about the billing process. The billing architecture of our proposed work offers seamless integration for creating a fully functional financial ecosystem.

The billing architecture of our inventory management system saves time and also reduces the cost as it is cloud-based and does not require IT support for integrating with the enterprise applications. The billing architecture of our inventory management system offers facilities to get connected with the external applications, new usage feeds and the third party internal systems in an easy manner in less time with effective cost. The proposed work will involve API which is known as an application programming interface for creating the flexible billing architecture that will provide the financial ecosystem in a synchronization manner. This will allow the customers to get an end-to-end billing experience.

Proposed Work

The proposed work will require the software requirements, hardware requirements, input and output which will help in architecting the billing architecture of the inventory management system. According to Tejesh and neeraja (2018), the accounting office of the company or the IT Office, the Inventory Management System is used. The first work done for the billing architecture of the inventory management system is designing the IMS. The IMS will help in providing the details of the purchase and sold products by the company to the customers and helps in designing the billing architecture of the company. The software requirements are done for the proposed works after collecting the information regarding the billing architecture which will help in designing the billing architecture for the inventory management system. The proposed work will require programming the algorithms at the starting. At first, the structure will be designed and after deciding the structure the system browser will be built.

According to HR and Aithal (2020), the billing architecture can be used by various customers therefore the work will be designed with the approach to reach every user. By creating the database and the login parameters can enable the use of IMS design. The proposed work will involve and facilitate portability. After designing the IMS, the next step for the billing architecture of the inventory system will involve the selection of languages to implement. The compatibility and ease of implementing the design should be decided. The proposed work will involve the PHP language for the billing architecture for our inventory management system. AJAX is used in the proposed work to make the system faster. The visual design of the billing architecture can be separated through the Model View Controller based structure.

For reducing the code lines, the proposed work uses Code Igniter Framework which makes the system faster. According to Basa et al. (2019), for the database purpose, MYSQL has been used. The inventory, sales record and purchase are maintained through the billing architecture of the inventory management system. The billing architecture also helps in monitoring the stock of the markets and enables alerts for the pending payments. The billing architecture helps the inventory management system to maintain the billing process and billing records. The inputs required in the billing architecture is products/Services, Payments

received, Delivery Challan to trigger invoice, Stocks Purchase and Forms received. The Outputs of the billing architecture of our Inventory management system involves tax payment alerts, commission reports and tax statements to the customers.

According to Payne et al. (2020), the billing cycle of our inventory management system provides GST templates for all the documents and reduces the headaches of compliance as it can easily manage the data of the inventory management system. The billing cycle helps the customers to get several options through which they can make the payment. The proposed works involve an e-biller Database where the information regarding the online-data, historical data and usage data can be stored. The payments, archiving and payment gateways are managed by the application Server, Presentation Server is used for showing the bill to the customers in the Inventory management system. SSL (Security sockets layer) is used by eBiller to provide security to payments and billing data transfer over the web. The security measure is based on public and private key encryption technology. The proposed work involves the Information Analysis Tools for providing detailed reports on their online customers for arranging the data and analyzing the payment information system.

Proposed diagram

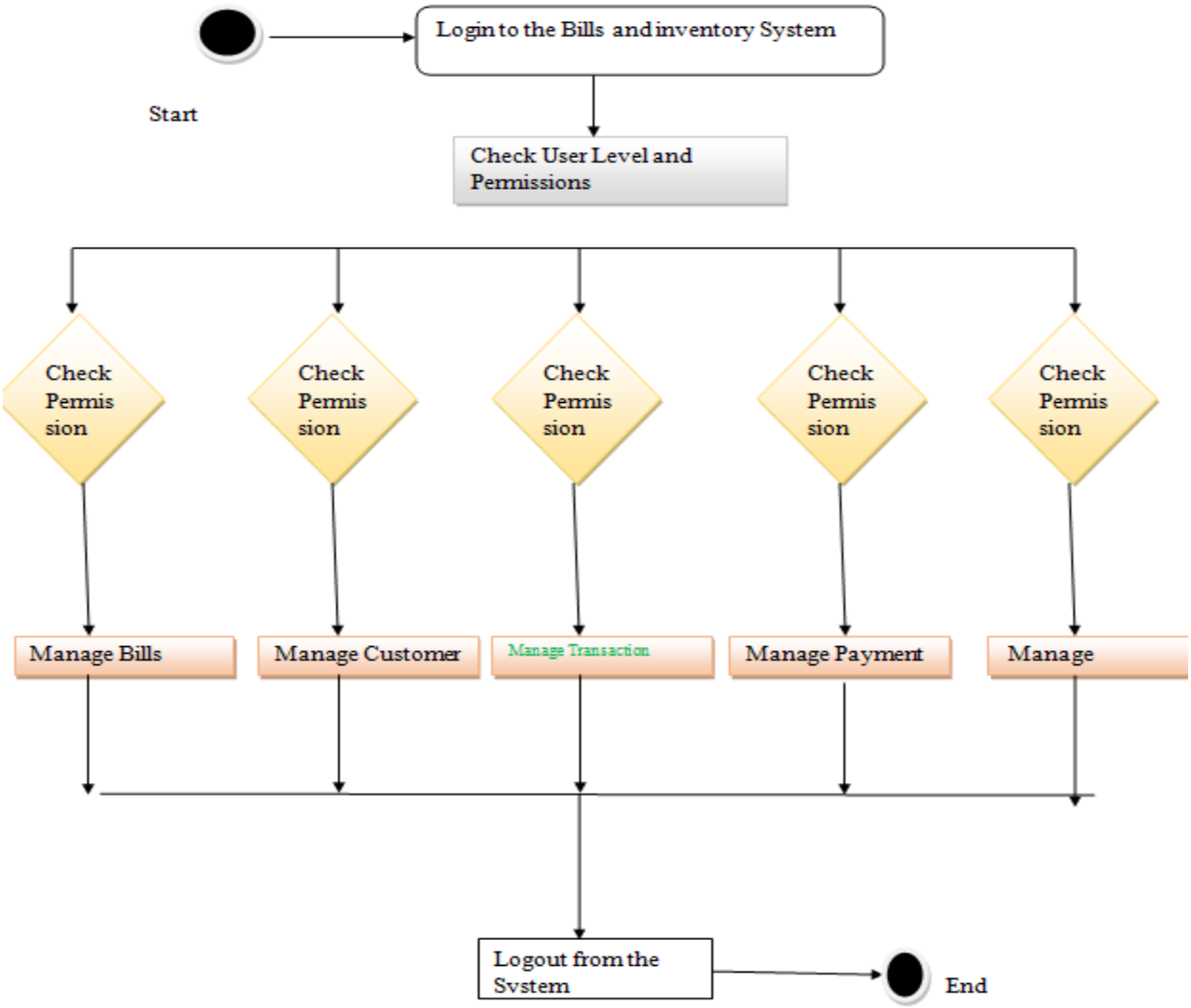

Figure 1: Proposed Activity Diagram
(Source: Acosta et al. 2018, p.766)

The proposed diagram is about the billing architecture of our inventory management system. The diagram is an activity diagram that shows the flows between the various activities performed during the billing process including transaction, payment, customers activity and transaction history. According to Sbai and Berrado (2018), this diagram helps to understand the activities performed in billing and also helps in understanding the billing architecture of inventory management systems. The operations performed on the procedure of billing have been explained in the diagram. In this proposed diagram, transaction history, bills activity, payment activity, customer activity and customers are shown. In this diagram, the transaction history of the customers, as well as view description, history update, transaction history and deletion of history, can be done by the admin user.

In this diagram, the billing architecture of our inventory management system has been shown. According to Dilon et al. (2017), the architecture of the billing in our inventory system involves the flow of editing, updating of payment as well adding of payment. In this figure, the users will be facilitated to search the billing reports as well as they can generate the reports. The customers can be easily found through billing architecture. The customers who have paid the bill or the customers who have not paid the bill can be easily distinguished. In the proposed diagram it has been shown that the transaction history, customer and payment are interlinked.

The flow of transaction history, customer bills and payment has been shown in the figure. At the first step, the user will log in to the bills and the inventory systems and check the user level and permission. The bills, customers, transaction, payments and transaction history can be managed through check permission. At last, the users can log out from the system. The diagram shows that the transactions that are processing are encrypted and secure.

Proposed flow chart

The proposed flow chart is a zero level data flow diagram of the Inventory Management System. The proposed flow diagram will help to find the billing architecture of the inventory management system. According to Ashika (2019), the billing architecture of our inventory management system helps in understanding the system with a high-level process. The diagram shows the relationship between the manager, expiry and login with the external entities of workers, goods and category. The high-level flow of the Inventory system has been described in the data flow of the inventory system. The high-level entities and process flow of the Inventory System involve the management of goods, category, warming, workers, manger, expiry and log in.

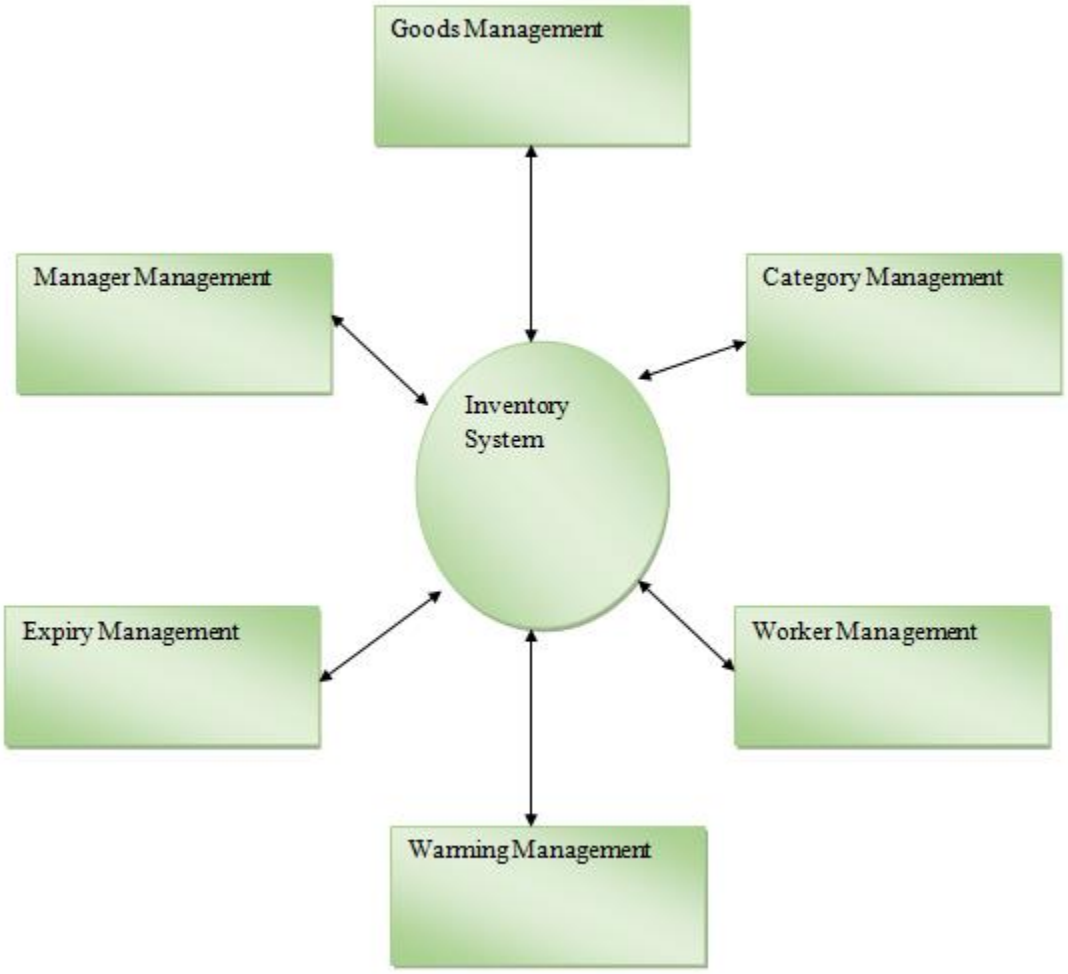

Figure2: Proposed Flow Diagram
(Source: Sun et al. 2021)

Comparison with other papers

The billing architecture of inventory management systems serves a function related to the different needs of the organization. The process of billing architecture is considered to be an important factor in managing the needs of the system. According to Rai et al. (2019), the concept of a billing system requires an important application that helps to provide functionality on the interface of management. The process of inventory management system develops the applications across the different levels of the organization. In the given paper, the determination of the different systems provides an approach to the requirements of different functions which are considered to be an important billing cycle. There are different parameters used in managing the functions of the billing cycle on the basis of a suitable level of requirements.

As compared with the other research paper on billing systems based on the environment of the internet, the strategy of the given architecture implements the functions of money transfer. The design of an internet billing system is easily used in demonstrating the complexity of the system with an accuracy of the suitable analysis. The gateway of the customers is used to enhance the methods based on the criteria of different perspectives. The addition of the customer requires an approach on the ability of the transactions. The

context of a management system develops a function in terms of different decisions on the maintenance of the given functions. The paper on billing architecture accumulates the methods which are arranged in order to provide an application on the portability of the system (Nishitha et al. 2019).

The architecture of billing enhances the possible approach on the design of the given criteria of transferability. The performance of the inventory management system helps in scanning the ability of the customer on the combination of different requirements of the business. The multiple consequences of the network convert the detailed information by recording the functional parts of the billing architecture. As per Bhosale (2018), the operations such as customer information, reporting, and managing the process helps in developing the factors which are used to facilitate the technology of billing. The account of the customer provides support to establish the regulations in different aspects. The comparison of the above paper briefly describes the production on the different levels of consequences. The functions of different data are associated to manage the occurrence of the given architecture of billing.

The flow of the given factor enhances the methods of decreasing the number of different ranges of resources. The implementation of the system analyzes the applications in terms of suitable aspects of the process. The novelty of the billing cycle helps in minimizing the products to acquire a system of business transactions. Choi et al. (2017) stated that the determination of billing charges originated from the different sources which are involved in the usage of payment processing. The cost analysis of the given billing system requires methods that are important to be involved in the systems of inventory management. In comparing the study of the billing architecture of our inventory management system with the other papers, the probability of the billing reduces the system in terms of different services.

Result Analysis

The billing architecture of our inventory system provides various payment options to the customers and helps in the revenue generation which depends on the consumption of the resources by the customers. According to Chebet and Kitheka (2019), using the billing architecture for our inventory management system helps in expanding the environment of billing. Customer Behavior Relation gets improved by using billing architecture. The inventory management system is a combination of hardware and software and used in the business to support the billing process of the company. As compared to the traditional method of Inventory management, the Inventory Management System helps in easily managing the billing of the whole business.

Using an inventory management system will reduce the chances of error and provides more accuracy. In the Inventory Management System, there is no human involvement in processing the bill which will increase the efficiency and decrease the time. According to Malakh and Srvakh (2019), the billing architecture of the inventory management system involves the generation of invoices, preview and by using the email, PDF of the generated invoice is sent to the customers. The previous and present stocks are available in the billing architecture of the inventory management system which is not present in the traditional billing method. The purchase orders, TOD, Taxes, Commission and bills are known as principle reports which are given in the billing architecture of the inventory management system. Profitability report is also present in the billing architecture of our Inventory management system.

According to Botha et al. (2017), the billing architecture of our inventory system provides tax statements to the customers. The tax statements in the billing architecture of our inventory management system provide clear information to the customers regarding the bills and tax information. The billing architecture of our inventory management system provides complete, pending, customer wise, product wise and incomplete supply orders which helps the supplier to flatten the volume of billing work. The cycling billing of the inventory system helps the supplier to easily track the customers who haven't paid the bill and decrease the administrative expenses. The billing architecture of inventory management systems involves the billing process which is based on alphabetical order that provides convenience in the billing process.

By using the cycle billing in our inventory management system reduces the volume of the billing work and the paid and unpaid customers can be easily distinguished which will help the company. It was difficult to manage the old billing process and inventory management was the issue of all the company. According to

Macoir et al. (2019), the innovative management system provides ease for the company to handle the customers as they work according to the schedule rather than doing it once at the same time. In cycling billing, the invoices can be issued by the last name of the customers and then billed according to alphabetically order. The use of inventory management systems helps to improve the productivity and efficiency of the business. The inventory management system provides an automation completion of the task which reduces the manual work. The reduction of manual work results in the reduction of errors and increases task efficiency.

The inventory management software provides an opportunity to print processes, shipping labels and manage the stocks. Using the billing structure of the inventory system helps in saving valuable time by performing the task automatically. The balance sheet can be easily maintained by using the inventory management system. The customer relationship can be affected when less amount of stock is present in the market whereas the presence of overstock can also be the reason for the loss of the company. According to Jhunjhunwala et al. (2019), the inventory management system provides a way for setting a limit to the stock which will provide more benefit to the customers. Track issues can be easily identified through quality management. The inventory management system allows the data which are checked through quality management.

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