LITERATURE REVIEW

Defense Industry ERP Application (Process Management and Enterprise Resource Planning)

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CONTENTS

1. Abstract

Information technologies are very important for businesses in terms of competition and speed [1]. Information technology is developing rapidly. One of the information technologies is the ERP system. ERP provides competitive advantage by covering all functional areas. Our project is an ERP system, but there is also a system for performance evaluation for company employees and cost calculation for the company. The aim of this project; reducing business time, providing faster information communication, better financial management, effective stock management, quality and traceability.

Öz

Bilgi teknolojileri, rekabet ve hız açısından işletmeler için çok önemlidir[1]. Günümüzde bilgi teknolojileri hızla gelişiyor. İş yükümüzü azaltan bilgi teknolojilerinden biri de ERP sistemidir. ERP sistemi, tüm fonksiyonel alanları kapsayarak rekabet avantajı sağlar. Projemiz bir ERP sistemidir ancak sistemimizin içerisinde şirket çalışanları için performans değerlendirme ve şirket için maliyet hesaplama sistemi de bulunmaktadır. Bu projenin amacı; firma için iş süresini azaltmak, daha hızlı bilgi iletişimi sağlamak, daha iyi finansal yönetim, etkin stok yönetimi, kalite ve izlenebilirlik sağlamaktır.

2. Introduction

ERP Application (Process Management and Enterprise Resource Planning) system is an enterprise information system It is designed to integrate and optimize business processes, employees' performance, costs and processes of work in a company. The ERP Application (Process Management and Enterprise Resource Planning) is an industry-oriented concept and system and is universally accepted by the industry as a practical solution to achieve an integrated business. ERP Application (Process Management and Enterprise Resource Planning) system handles a wide range of planning, operation and accounting functions such as accounting, finance, logistics, production planning, stock management, production, quality management, human resources in an integrated manner[2]. The purpose of this system is to facilitate and improve the cooperation and interaction between all these functions. This purpose is to examine the ERP Application (Process Management and Enterprise Resource Planning) system, which is one of the important information technology systems of today, to design this system according to the company we will work with, to create a portal and make it ready for use. ERP Application (Process Management and Enterprise Resource Planning) system can help a corporation become more self-aware by linking information about the production, finance, distribution, and human resources together [3]. The ERP Application (Process Management and Enterprise Resource Planning) system is a system that allows the company to track and record each process (now and retrospectively) from the arrival of each product to the shipment.

3. History of ERP Application

ERP systems are comprehensive pieces of software with a variety of functions and applications available to the user. Their history reflects this as ERP solutions aim to organize and coordinate large-scale business processes. ERP systems started out as a way to expand the coordination of different manufacturing initiatives within a single business area, and then evolved to include more specialists. ERP systems have been created with many different software tools. Every decade up to today has brought its own new ERP software with the latest developments. [4]

3.1 The First Attempts to ERP Application

1960: Inventory Control Systems

J.I. Case is a tractor and construction equipment manufacturer. He first worked with IBM (International Business Machines Corporation [5]) to develop the MRP (Material Requirements Planning) system. Later, large manufacturers created these MRP solutions themselves. Systems were expensive to create, take up a lot of space and require many expert teams for maintenance, but MRP systems have provided great convenience for businesses to follow production. It has helped producers manage their supply and delivery, making it easier to plan production runs. [6]

- Determination of inventory requirement
- Target determination
- To provide a renewal technique [7]

1970: Materials Requirements Planning

MRP systems started to attract attention in 1970, but the system was used only by large companies due to the cost of the system. Oracle, JD Edwards, and several major software vendors with it are all set to make more businesses use the software. [8]

- Production requirements of finished products

Production system structure

-Inventory levels

-Lot sizing procedure [9]

1980 : Manufacturing Resources Planning II

In the 1980s, companies needed a software to keep track of their accounting systems and the required inventory list for their firm. Production Resource Planning (MRP II) started to be used by companies as an information system. Production Resource Planning (MRP II), in addition to its previous version (1970-MRP I [10]), Adds data to the system with the needs of employees and financial needs of the company. MRP II was widely used in those years. ERP systems today are much more comprehensive than the MRP II system used in those years. [11]

1990 : Enterprise Resource Planning

In 1990, the term "Enterprise Resource Planning" was coined by the research firm Gartner [12]. It has been accepted that this system, which was used only for production in the past, is now used not only for production, but also for many businesses to increase the efficiency of all operations. ERP systems acquired their current identity in 1990. ERP systems have brought along other jobs such as sales, accounting, engineering and human resources to serve as a single source of accurate data for all employees. The ERP system has continued its development throughout the 90s. The advent of cloud ERP by NetSuite in 1998 was a major breakthrough for ERP systems, which meant that companies no longer had to purchase and maintain hardware.

2000 : Web Functionalities with Internet (ERP II)

The ERP II system, used in the 2000s, is a web-supported information system to manage the operations that need to be done in companies. The biggest difference between the previous years is that this system, namely ERP II system, is web based. [13] The biggest advantage of this system being web-based is that it facilitates resource planning and collaboration. What is meant by cooperation is that it is a system that can be accessed not only by the institution, which is the main user of the system, but also by its supplier and customer. Moreover, it is more economical than all other systems in terms of cost, allowing small companies to use this system. Apart from this feature, it contains all the features of the ERP system in the same way. [14]

2010 : Cloud-based ERP

Business applications are offered as software models. Servers are deployed in the cloud and rest of access is provided with APIs. In the SaaS(Software as a Service[15]) model, Android, IOS and browser applications have been developed for ERP software. It helped every company to start using an ERP system because of its low upfront cost.

4. ERP Application (Process Management and Enterprise Resource Planning) System

4.1 Description

ERP Application (Process Management and Enterprise Resource Planning) system is a software system that includes the functions of planning, coordinating and controlling the supply, production and distribution resources in different geographical regions in the most effective and efficient way in order to meet customer demands in the most appropriate way in line with the strategic goals and objectives of the enterprise. Companies implement ERP Application (Process Management and Enterprise Resource Planning) system packages to integrate business processes into various functions.

The ERP Application (Process Management and Enterprise Resource Planning) system helps businesses to automate all business processes, employee performance, and financial calculations in the organization as a whole, rather than just some functional units.

4.2 Working Mechanism of CDK Savunma

We will start our project by setting up our design. While doing this design, we must consider the stages that each product in the company goes through. Figure 1 shows the stages the products go through from their entrance to the company to delivery to the customer.

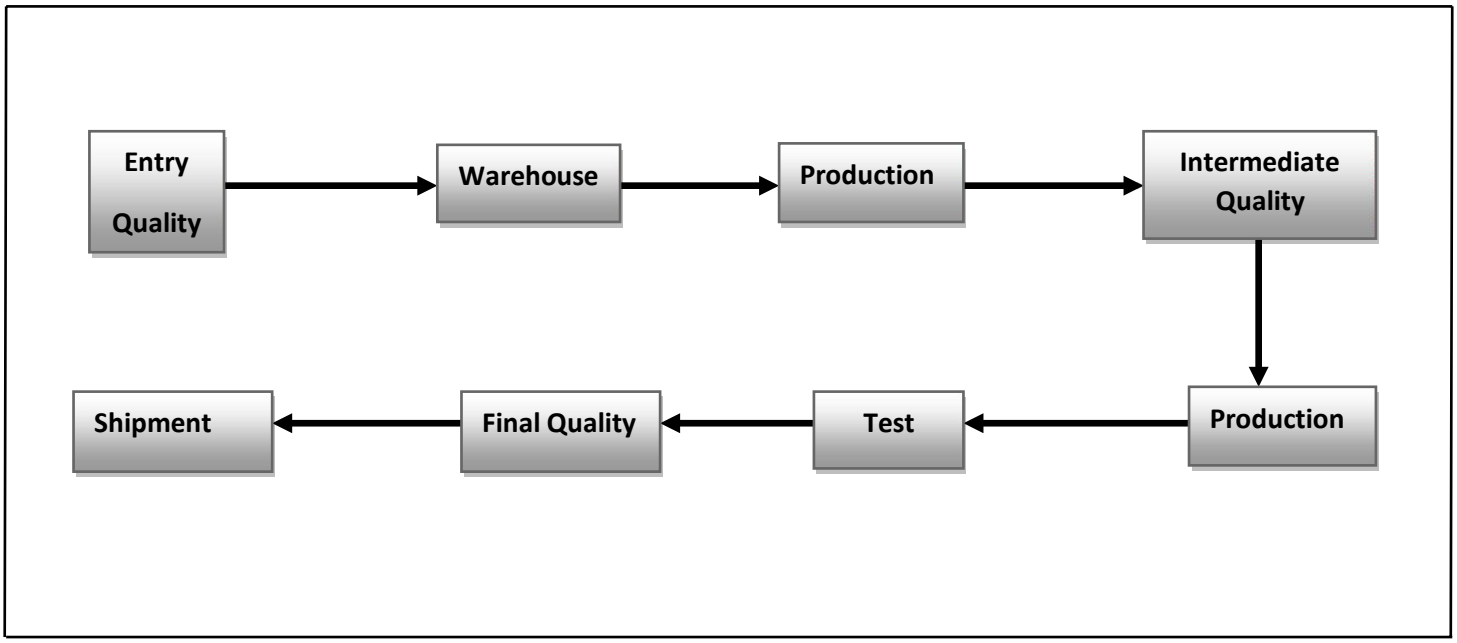

Figure 1 : Working Mechanism

Purchased products go into entry quality first. Here, the amount of each product and the necessary documents are checked. The products that pass the control are kept in the warehouse until they are taken to the production plan. Each product taken into production is checked at intermediate quality after a certain stage. The products that pass the control are returned to production. After the production is completely completed, it goes to the test phase. Every product that passes the test is checked in the final quality.

As the last step, the products whose control has been completed are prepared and shipped. We will design your project according to this working mechanism. Following these steps on the virtual path is very important for the company. The ERP Application (Process Management and Enterprise Resource Planning) System will enable us to follow the steps in a virtual environment and make the data more accessible and storable for each product.

4.3 Expectations of the CDK Savunma

We started this project in line with the company's wishes. The reason why the company wanted an ERP system was the requirement to use such a system in order to have the AS9100 certificate [16] and it is easier to keep track of inventories within the company. The system that the company wants from us is a web-based system because it is easy for the authorities to access and can access the system outside of the company computers. The fact that the system is web-based will not cause a problem for the company in terms of security because no users will be able to register to this web-based ERP system, they will only access the user names and passwords created by the name of this system. Certain authorities will be assigned for each step described in section 4.2 and a user name and password will be given to these authorities. Step officials in the company are currently recording their products on an excel sheet for each step. These excel files cause a lot of confusion, and the entry of product definitions into excel files over and over for each step increases the workload. Basically, the company's request for this system is that it needs such a system to facilitate the tracking and recording of the products, to reduce the workload of step officials and to become an AS9100 certificate. In addition to the company's ERP system, cost control and performance evaluation pages for company personnel are available in the system.

4.3.1 Working Mechanism in ERP

Our project will work like a portal. Authorities will be given a username and password through the web page, and each user will be able to edit the pages within their authority. However, every user will be able to view every page on the system. A user who logs into the ERP system according to the degree of authority can check the conditions suitable for user business model, the stage of the products, and the business plan and regulations. The user, who logs into the ERP system with a different authority within the institution, can instantly follow the work orders, project cost and performance reports depending on the degree of authorization, and can directly download and restore the documents requested by the state institutions serving in the defense industry through the ERP system. Finally, the user who logs into the ERP system can follow the performance reports of the employees of the institution, the entire financial status and accounting details of the institution, the performance of each individual and team separately, and can view this process instantly, according to the level of authority.

Although ERP systems are available in the market for ready-made and general institutions and, contrary to this generalization, are very costly systems, we have taken as a basis to fulfill the requirements of the companies serving the defense industry, an ERP program that has a large market and importance in our country and is suitable for their business and product creation processes. Along with these, we plan to provide access to cost and specific performance criteria through the system. This program, which will save the workload of people in the sector and in the institution, will save the document crowd, and we aim to share the data that companies working simultaneously and in the sector want to share with each other instantly by opening simple authorized accounts.

5. Conclusion

In addition to the steps we explained in the Working Mechanism section in our system, we will also make employee performance evaluation and cost calculation. The ERP Application (Process Management and Enterprise Resource Planning) system enables the tracking of products, planning the products, and storing the records of the products' data for the past and for today. In addition, we will ensure that the performance evaluation of each employee working in our ERP Application (Process Management and Enterprise Resource Planning) system and the cost calculations of each product made can be made.

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