Research Article

Development of Smart Software Program for Production and Order Tracking in the Textile Industry

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Abstract

As a result of growth and development in the industry, difficulties in managing increasingly complex information flows, international competitive conditions, and rapid change in technology have led the business world to seek different solutions. At this point, computer-aided order tracking systems stand out as tools that provide advantages to businesses. In this way, it becomes possible to be successful in competition in an environment of constant change, to be able to predict changing business conditions and to respond quickly to them. Companies use ERP (Enterprise Resource Planning) applications that ensure the efficient use of resources such as labor, machinery and materials required for the production of goods and services in their businesses. However, since these applications cover large areas, they cannot always provide a full solution to the specific operations of companies. Many business transactions in businesses are tracked through Excel tables. Within the scope of the study, it is aimed to develop an automation application that will allow companies to apply it without changing their operations, prevent errors and data loss with fixed formulas, and greatly increase efficiency with warning, order tracking and report structures.

Keywords: *Yarn Business, Production and Order Tracking, MsSQL, HTML and CSS*

1. Introduction

In the business world, quality, time and cost are of serious importance for the management of the business, and today the use of information technology has also been

added to these. In order for businesses to gain superiority over other businesses in the competitive environment, business planning and follow-up must be carried out quickly and systematically. Like all manufacturing sectors, orders received in yarn mills in the textile industry are determined before production starts, and then production dispatch planning is made. This planning is carried out by the planning department in businesses according to the demands of the customer or the corporate memory of the company. This planning document is distributed to the production-related departments of the enterprise in written forms by preparing a template on the Excel program, and this form is called a work order. This form contains the number, blend content, twist, cone type and deadline information of the yarn to be produced. In order for these prepared work order forms to be processed, the approval of authorized persons must be obtained and it requires a long process and follow-up. Additionally, after the work order is prepared, it may be necessary to make some changes depending on the customer or business situation, and this causes the process to take longer and errors to occur. In addition, the color of the cone on which the yarn will be wound is also of great importance and it is necessary to follow it in order to avoid mixing the types of yarn produced. When the literature studies on this subject are examined; studies have been found regarding determining the place and importance of the ERP system for ready-made clothing enterprises [1] and revealing the relationship between the ERP system and production activity control systems [2]. It has been concluded that production planning is made using computer-aided production tracking [3] and decision support systems [4] in the weaving, knitting and apparel activity areas of the textile industry. However, since there are not many material and product variables in spinning mills, Excel templates and basic software programs are used instead of large and comprehensive ERP systems. In this sense, a digital application needs to be developed to track yarn production and shipment in an error-free and efficient manner. Taking into account all these requirements, within the scope of the study, it is aimed to design a web application that enables data exchange over the network and tracking of order statuses and adapting it to businesses.

2. Materials and Methods

2.1. Materials

Within the scope of the study, a web application will be developed to create the work order format, including the type of raw material in the yarn composition, blend ratio, yarn number and twist, machine elements to be used in spinning that vary depending on the yarn type, cone color information, fixing status, customer and deadline information.

2.2. Methods

In the study, the database where the data will be stored, Front-End, where the data will be interpreted and processed and the user interface will be created and Back-End structures will be created to ensure database communication with the Front-End.
Microsoft Structured Query Language (MsSQL) technology will be used for the database, .NET CORE 5.0 WEB API technology, EntityFrameworkCore 5.0.8 auxiliary libraries, C# programming language, and Microsoft Visual Studio IDE will be used for the Back-End. For Front-End, Angular CLI 12.2.9 technology, Angular Material auxiliary libraries, Typescript, HTML and CSS programming languages, Visual Studio Code IDE will be used. In addition, in the program to be developed, the e-signature method will be used so that authorized persons can approve the created work order form. The web application to be developed will be created within the framework of clean code, object-oriented programming, modularity and divisibility, performance and optimization, security and reusability criteria.

3. Results

The production and order tracking software program to be developed within the scope of the study has a user interface that can be accessed by authorized persons and includes a Home Page where the latest status of the created work order forms is listed, a Plan Creation Page where the information in the work order form is filled in and the work order is created, a Production-Dispatch Transaction Page, where production-shipment information for each work order is included and updated, a Customer Transaction Page, where all customers the company works with are listed, a Cone Transaction Page, where all existing cones are listed and stock is tracked and a Production-Delivery Report Page, which contains a graphical report of all the yarns the company produces to its customers. The image of the software program developed within the scope of the study is given in Figure 1.

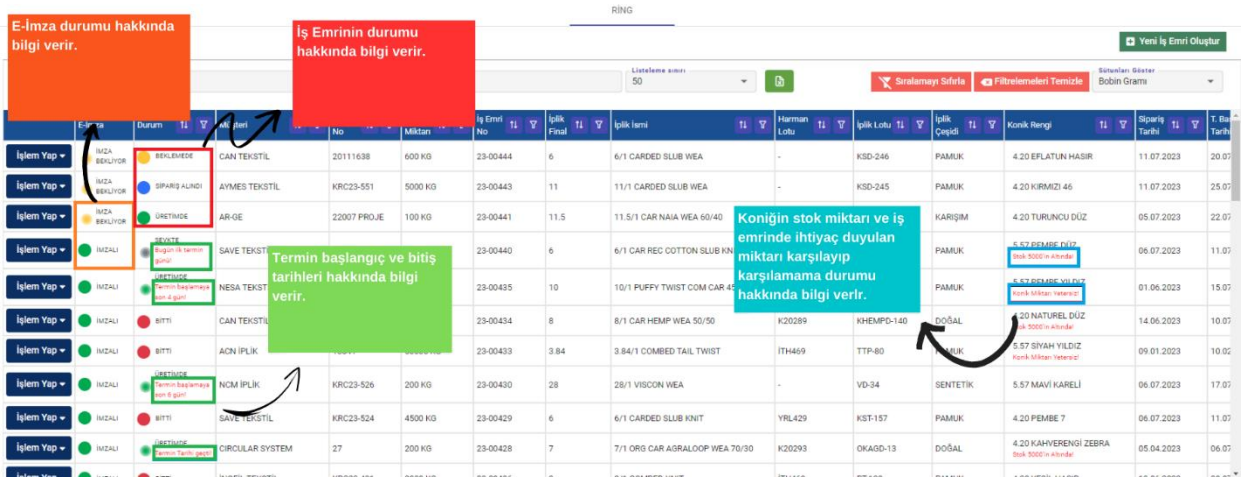
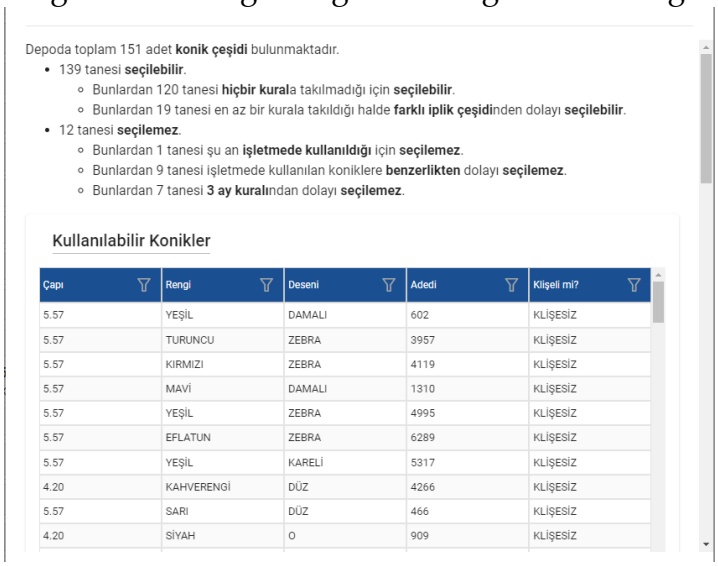


Figure 1: Image of the developed production and order tracking software program

In addition, the developed software program includes user restrictions, mandatory information entries, automatic calculation of information linked to each other with formulas, necessary filters and warning structures, and the images in which the program performs these filtering and warnings are given in Figure 2 and Figure 3, respectively.



Depoda toplam 151 adet **konik çeşidi** bulunmaktadır.

- 139 tanesi **seçilebilir**.
  - Bunlardan 120 tanesi **hiçbir kural**a takılmadığı için **seçilebilir**.
  - Bunlardan 19 tanesi en az bir kurala takıldığı halde **farklı iplik çeşidi**nden dolayı **seçilebilir**.
- 12 tanesi **seçilemez**.
  - Bunlardan 1 tanesi şu an **işletmede kullanıldığı** için **seçilemez**.
  - Bunlardan 9 tanesi işletmede kullanılan koniklere **benzerlikten** dolayı **seçilemez**.
  - Bunlardan 7 tanesi **3 ay kural**ından dolayı **seçilemez**.

Kullanılabilir Konikler

Çapı	Rengi	Deseni	Adedi	Klişeli mi?
5.57	YEŞİL	DAMALI	602	KLİŞESİZ
5.57	TURUNCU	ZEBRA	3957	KLİŞESİZ
5.57	KIRMIZI	ZEBRA	4119	KLİŞESİZ
5.57	MAVİ	DAMALI	1310	KLİŞESİZ
5.57	YEŞİL	ZEBRA	4995	KLİŞESİZ
5.57	EFLATUN	ZEBRA	6289	KLİŞESİZ
5.57	YEŞİL	KARELİ	5317	KLİŞESİZ
4.20	KAHVERENGİ	DÜZ	4266	KLİŞESİZ
5.57	SARI	DÜZ	466	KLİŞESİZ
4.20	SİYAH	O	909	KLİŞESİZ

Figure 2: Cone filtering image of the developed production and order tracking software program

Figure 3: Insufficient cone quantity warning image of the developed production and order tracking software program

It has been concluded that the production and order tracking program developed within the scope of the study has positive effects and functionality such as ease of use because it does not consist of complex structures and sections, quick access to the desired information thanks to the filtering feature, timely delivery of orders to the customer with warning structures, reducing error rates with authorization processes and creating the corporate memory of the company by keeping work order history records, ensuring stability in production and thus meeting customer satisfaction.

4. Discussion and Conclusion

Information technologies are systems that aim to examine and group information, deliver it to users in a certain order and make it available for use. The obligations of businesses to manage their resources in the best possible way, to ensure customer satisfaction, and to create a technological infrastructure for information management have led to the development of new applications within information technologies and their adaptation to business management [5]. Based on this, trying to carry out the production and order tracking within the company using the Excel application, which is the basic level, causes significant loss of time and business disruptions due to incorrect or incomplete information entries. Within the scope of the study, it was aimed to develop a software program to create a technological infrastructure and adapt it to the business in order to make production and order tracking practical, fast and error-free. It was concluded that the production and order tracking program developed within the scope of the study contributed to the prevention of time, production and financial losses while providing user convenience and systematic working comfort. Thanks to digital tracking, faulty productions are prevented, waste of raw materials and energy resources is prevented, and sustainable production is achieved. In addition, it has been observed that the developed production and order tracking program model provides information accuracy and reliability by allowing work orders to be created only by authorized persons,

elimination of risk factors by including warning structures, security by access restrictions, and traceability by being able to view the arrangements made.

5. Acknowledge

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