Research Article GU J Sci, Part A, 10(2): 241-261 (2023) 10.54287/gujsa.1255461

Gazi University
Journal of Science
PART A: ENGINEERING AND INNOVATION
http://dergipark.org.tr/gujsa

Process Improvement Between Company Departments with the Integration of ERP and CRM Software Programs

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Keywords

ERP-CRM Integration
CRM Software System
ERP Software System
Information Technologies
Integrated Software Systems
Coding

Abstract

This study aims to examine the processes of a company that uses Enterprise Resource Planning (ERP) and Customer Relationship Management (CRM) systems, which are known as integrated systems, and improve these processes in an enterprise that produces decorative acoustic suspended building products. The company started to use Netsis software as an ERP system years ago. Then, it purchased the LogoCRM software, which could work integrated into Netsis software, to ensure information flow between these systems easily. Since it is known that the company still experiences information flow issues between the departments although the ERP and CRM systems of the company are integrated, the study tried to minimize these deficiencies in the information flow between the production and sales & marketing departments. The problems experienced between the departments of the company that we work with were determined by the interviews with the ERP and CRM system users in the company, and the ERP-CRM software was customized to be suitable for the use of the company. A user-friendly interface has been designed in the CRM software, and by providing integration between the software, it is possible to see the stock balance information instantly in the CRM software. In addition, in the CRM software that will work integrated with ERP, a smart coding algorithm was developed to minimize errors by considering the possibility of the sales team misreading the product cards, and it was aimed to reduce user errors by minimizing the screen interventions of the users. In the study, ModelEditor was used for the improvements made in the SQL-based CRM software. With this study, communication problems between sales-marketing and production departments were reduced by providing ERP-CRM integration. As a result of the improvements made, a common language was developed between the departments, reducing the amount of faulty production, and time savings were achieved by reinforcing the cooperation between departments.

Cite

Yilmaz, M. U., Özyörük, B., & Ocak, S. B. (2023). Process Improvement Between Company Departments with the Integration of Erp and Crm Software Programs. *GU J Sci, Part A, 10*(2), 241-261. doi:10.54287/gujsa.1255461

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Article Process

Submission Date 23.02.2023
Revision Date 28.03.2023
Accepted Date 24.04.2023
Published Date 26.06.2023

1. INTRODUCTION

In line with the developments in the globalizing world, all concepts have been affected. The concept of Enterprise Resource Planning (ERP) has entered our lives with the start of performing the production, accounting, inventory, and warehouse control processes of enterprises in computer-based systems. Optionally, ERP modules can be implemented and integrated into logistics, marketing, social media data and other external data sources supplemented by various additional concepts such as Business Intelligence (BI) Methods, Supply Chain Management (SCM), and Customer Relationship Management (CRM) (Laverty, 2022)

Today, where the product-oriented marketing approach has been abandoned, enterprises have tended to follow the customer-oriented marketing approach. On the other hand, customers prefer enterprises that show individual relationship rather than traditional sales methods. Customer relationship management aims to

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identify profitable customers for the company and to increase the loyalty of these customers by managing the relationship between customers and the enterprise.

Based on the operational problems, Tacer realizes that they needs a system that can integrate every part of the organization (Rinaldy & Juarna, 2022). According to the results of the assessments made by considering factors such as using Netsis software as an ERP system, price-performance efficiency, and the suitability of the software to the requirements, LogoCRM application was purchased as a CRM system to ensure the ERP-CRM integration.

LogoCRM, which has been purchased by the company, is a CRM software package of Logo, which has achieved to become a leading company in the Turkish software industry in a short time. After entering the ERP market with its accounting software package, Logo developed itself over time and introduced Tiger 3, Tiger 3 Enterprise, Tiger Wings, J-guar 3, Netsis 3 Enterprise products in the field of ERP (Tacer, 2023). Then, it increased its product range and activities in the industry and developed several products such as LogoCRM, which is used as a customer relationship management software, LogoHRM, where we can transfer human resources processes to the digital environment, LogoWMS, which is used as a warehouse management system, LogoFlow, which is used as workflow management software, and LogoISG, which enables to manage Occupational Health and Safety processes in accordance with legal regulations.

With LogoCRM, the company wanted to create its own customer portfolio by gathering its customers in a single database. Moreover, with the use of the LogoCRM system, sales representatives can transfer their quotes to the ERP system as an order through the software as soon as the quote they receive turns into a sale. This will facilitate the control of orders and reduce the workload by ensuring the production-sales integration quickly. Another expectation of the company from LogoCRM software is that sales representatives are now enabled to check the warehouse and provide accurate information to the customer.

In this context, the relationships between the production and sales & marketing departments in these systems were addressed. Then, the stages of customizing the LogoCRM software for the Tacer company, which has been studied as an example, in accordance with the needs of the company, are explained in detail, and an example road map has been created for other companies to eliminate the internal functioning problems.

2. INTRODUCTION RELATIONSHIP BETWEEN PRODUCTION AND MARKETING DEPARTMENTS

The Oxford Learner's Dictionaries define the term 'business' as follows: the activity of making, buying, selling, or supplying goods or services for money (Oxford Learner's Dictionary, 2023). Based on this definition, enterprises can be described as organizations founded by entrepreneurs by using their labor and capital to gain profit (Demirkapı, 2013). In order for enterprises to survive today, they need to be able to adapt to today's marketing methods. Therefore, the idea of relationship marketing, which emerged in the 1980s, caused traditional marketing systems to change. The concept of relationship marketing was first used by Leonard Berry in 1983 to mean service marketing (Savasci & Ventura, 2001). With the concept of relationship marketing, which entered our lives thanks to Berry, it has been understood that the concept of traditional sales and marketing, where only production exists, has not been enough for enterprises to continue their operations, and that the main thing has been trust-based relationships with customers (Morgan & Hunt, 1994).

Enterprises should constantly aim to improve themselves to adapt to today's marketing techniques and to survive in this competitive environment. Therefore, keeping the internal dynamics active within the enterprise has almost become a prerequisite for them. Of course, all departments should work synchronously to achieve it. In general, the concept of relationship marketing has focused on the relationships between company employees and customers, so the relationships between the departments in the enterprise have been neglected.

Perceptions and problems of marketing and production departments in the enterprise differ from each other. However, these departments need to achieve these goals in cooperation by setting goals that will serve the same mission together. In this part, production and sales & marketing departments and their functions will be defined to achieve this cooperation.

2.1. Production Systems

In its most general definition, it is the creation of goods and services with economic value. In the end, production is not only the physical creation of a product, but also all of the activities done to add or increase the value of a product. (Başkak & Tanyaş, 2006) As can be understood from its definition, the most significant point of the concept of production is the emergence of a product that creates benefits as a result of the activities carried out. With globalization and technological developments, manufacturing enterprises have started to change their production structures (Bagdat & Can, 2023). With the change in the production structures, the definition of production has started to evolve and change.

Production systems vary widely according to the type, quantity, or characteristics of the products. Thus, production methods vary taking into account this and many other features (Saadet, 2012). Although there are several different ideas in the literature on this subject, in general, we can list according to the amount or flow of production four types of production systems as follows:

- Continuous (Mass) Production Systems
- Batch Production Systems
- Mixed Production Systems
- Project-Type Production Systems (Kurgan, 2023)

Continuous (mass) production systems are used in productions where the demand is high and the variety of products is low. In batch production systems, the variety of products is high, that is, small quantities of various products are produced. In batch production systems, production is performed taking into account the customized orders of the customer, or the customer's continuous demand from certain product groups are produced. Mixed production systems can be considered as a combination of these two production systems. The company uses a mixed production system when manufacturing both customized orders for the customers and performing mass production to meet their continuous demands. In project-type productions, the level of technical specialization is high, and there is a special and unique product. Therefore, project-type production systems are the most costly production type.

Although the concept of production was first defined as the manufacturing of a product that creates benefits, since the manufacturing enterprises do it to make a profit and the resources are not unlimited, the production aims to use resources efficiently and to create the highest level of consumer satisfaction. Especially considering the competitive environment in today's world, the severity of the process should be understood. With the continuous development of technology and the growing of enterprises, we can no longer rely solely on manual data statistics and management (Liu et al., 2020).

Therefore, with the introduction of computer systems in our lives in recent years, production systems have also been tried to be integrated into computerized structures. With the developments in computer technologies, companies have begun to widely use computers in areas such as production and planning as well as management processes (Demirel & Karaagaç, 2014). Therefore, many concepts, such as computer-aided manufacturing (CAM), computer-aided design (CAD), computer-integrated manufacturing (CIM), and computer-integrated manufacturing (CIM), have emerged over time.

On the other hand, ERP systems have been designed as “integrated systems” due to the designs of applications that support the operations of companies (Sevim & Bulbul, 2016). ERP systems are fully integrated business management systems that plan all the resources of a company and meet all information needs. It combines the software processes of all departments into a single database (Kecek &Yıldırım, 2009). However, these systems may cause an increase in the number of inappropriate automation islets, and if this happens, the company experiences challenges in using all of its technology and equipment potential, resulting in a lack of integration and coordination (Sağlam, 2008). In other words, if the production and order systems of the company are not synchronized, this will cause a decrease in production efficiency as well as customer dissatisfaction.

2.2. Sales & Marketing Systems

People did not need sales and marketing in the periods when they consumed what they produced themselves. However, after the transition to settled life, people began to consume less than what they produced, and they exchanged the rest of their products with other products they needed. The exchange activities that started between people and small groups developed with the transformation of these groups into societies and turned into large commercial activities. With the change and development of commercial activities over time, the importance of marketing activities has increased. It is known that even in ancient times, specialization was made in terms of products, and these products were marketed (Doğan & Başgelen, 2008).

In the marketing literature, there are many definitions. Based on these definitions, we can follow the evolution and change of marketing over the years. For example, the definitions of marketing made by the American Marketing Association (AMA) over the years are as follows:

"Marketing is the performance of business activities that direct the flow of goods and services from producers to consumers."

This definition was the first definition of marketing published by the American Marketing Association in 1935 (Kaya, 2023). Although various definitions were made over the years, the definition made in 2017 is as follows:

"Marketing is the activity, set of institutions, and processes for creating, communicating, delivering, and exchanging offerings that have value for customers, clients, partners, and society at large." "

As can be understood from the change between the two definitions, marketing has changed much over the years in terms of understanding and perspective. Especially with the emergence of the concept of relationship marketing in recent years, traditional marketing strategies have been abandoned. According to traditional marketing strategies, the goal is achieved with the sale of the product or service. On the other hand, in relationship marketing, the goal is to establish long-term customer relations with the customer after the sale of the product. Since customer satisfaction is so important, processes in relationship marketing have become customer-oriented rather than product-oriented. That is, as shown in Figure 1, marketing has evolved from a production-centered understanding to a customer-centered understanding of today.

Figure 1. *Evolution of Marketing Processes*

2.3. Relationship Between Production and Sales & Marketing Systems

In order for companies to provide better quality service, integration between departments is required (Güçlü Hacıoğlu, 2022). Coordination and continuous data exchange is essential for production planning and sales & marketing actions for manufacturing enterprises (Aydın & Dursun, 2022). Therefore, coordination between production and marketing departments is required for many enterprises to continue their activities successfully. It is essential to ensure coordination between these departments in order to provide the right product or service by correctly understanding the demands and requirements of the customers. Communication or lack of communication between these departments directly or indirectly affects customer satisfaction. Although there may be disagreements between all departments of companies, clear differences may be observed between the goals of the production and marketing (or sales) departments (Sezen et al., 2002).

As it is known, the purpose of enterprises is to be active in the market for as long as possible by obtaining maximum profit. In today's market conditions, companies need to constantly improve themselves to exist in the market. In other words, the companies should ensure the production of new products and make them demanded in the market by evaluating the needs and requests of the customers together with the work of the sales & marketing department. The production stage of the product is evaluated by considering the resources

of the production department in order for the process up to this stage to become profitable for the enterprise, In light of the information provided by the sales & marketing department, the production department evaluates the production plans, R&D studies, and the profit margin of the product to be produced for the company. Therefore, the sales & marketing systems should have close relationships with production systems, and there must be a constant information flow between them (Dilek, 1993).

3. IMPLEMENTATION

Although the production and sales& marketing departments of the company operate integrated with each other, it has been decided to make some improvements according to the results of the evaluations made after interviewing the employees in the company.

3.1. Smart Coding for Materials

Unfortunately, one of the biggest problems between the sales & marketing department and the production department is that sales representatives and employees in the production department do not define stocks in the same way. In other words, since the users of the CRM system do not have a good command of the codes of the products defined in the ERP system and are not actually involved in the production processes, communication problems may occur between these departments. Therefore, it was decided to use the smart coding system while opening the product cards and to define the codes of the products using an algorithm that everyone can understand. With the "Smart Code" feature, it has been tried to generate constant stock card codes (in accordance with the previously determined template) and thus to ensure the standardization of the codes.

The following issues are considered while creating a typical smart code system (Kobu, 2003):

- All codes must contain details that may be important to each user who will use the code, and these details must always be provided in a specific order.
- The factors determining the length of the codes should be taken into account.
- The groups specified in the system should be easily separable into subgroups if necessary.
- For preventing confusion in the current coding, the 'Ø' sign should be used to omit a breakdown.
- Codes should be separated from each other using the signs such as (.), (-), or (/).
- Codes may be grouped considering reasonable relations.
- Classifications should be made in accordance with international classifications.
- The information provided by the code should be simple enough to be used without needing to look up the prepared guide.

The products were examined in detail by interviewing the ERP officials of the company in line with this information. First of all, the products are classified into the following three basic groups: raw materials, semi-finished products, and finished products. While raw materials are never sold by the company, semi-finished products are mostly not sold. However, all products, except for several ones, are included in the smart coding system.

3.1.1. Codes Created for Raw Materials

The company has raw materials such as paint, wood, plaster, metal, fabric, etc. required for the production of suspended ceilings. Incremental numbers were given to the materials in the inventory while coding them, and detailed information about the inventory is coded in the inventory cards. The details to be specified by the inventory code are determined during the study of the products.

Step 1: Determining the Features of Raw Materials

Typical features that are considered significant in smart coding are as follows:

- Details about the main classification of the raw material (wood, packaging, etc.)
- Details about the model of the raw material

- Color of the raw material
- Size of the raw material

Step 2: Defining the Specified Classification Features by Letters and Abbreviation

Firstly, code 'HM' shall be included in the code to indicate that it is a raw material.

Secondly, the details about the main category of raw materials shall be included. Table 1 presents some main categories.

Table 1. *Examples of Main Classifications and Abbreviations of the Raw Materials*

Main Categories of the Raw Materials	**Abbreviation (In Turkish)**
MDL METAL	MM
MDL PLASTER	MC
PLASTERBOARD	CP
FABRIC	KM
MDL SFTB	MS
MDL WOOD	MA
GLUE	TT
BEARING ELEMENT	TS
MATERIAL	ML
PACKAGING	AB

In two-word abbreviations, the letter 'M' always stands for metal, the letter 'A' stands for wood, and the letter 'C' stands for plaster.

In the third layer, the model features of the raw materials are coded. Some abbreviations used in coding are shown in Table 2.

Table 2. *Examples of Color Features and Abbreviations of the Raw Materials*

Model Features of the Raw Materials	**Abbreviation (InTurkish)**
ROLL	RL
PLATE	LV
CLIP-IN	CL
WOODEN BAFFLE	AB
BAFFLE	BF
SEPARATOR	SP
FABRIC	KM

The fourth layer of the code indicates the details about the color of the product. Some of the raw materials used have RAL color codes. RAL color chart, which has more than 200 shades in its collection, was first published in 1927 by a subsidiary of the German Institute for Quality Assurance and Certification (Çelebi, 2013). The color of the product should be specified using the corresponding code in the RAL color chart. If the product is not included in this chart (wood products such as walnuts, bamboo, etc.), the color should be abbreviated using the first three consonants. If a color has less than three consonants, the existing consonants should be followed by the first vowel after the consonants to adapt to this algorithm. If it is required to specify color shades using multiple words, the initial letter of each word is written then a consonant of this color is added. In addition, the

letters ‘M ‘and ‘Y ‘shall be used to indicate whether the product is matte or semi-matte, respectively, which is important for the company. Some abbreviations used in coding are shown in Table 3.

Table 3. *Examples of Color Features and Abbreviations of the Raw Materials*

Color Feature of the Raw Materials	**Abbreviation (InTurkish)**
MAPLE TREE	AKC
WALNUT	CVZ
BLACK	SYH
WHITE	BYZ
CHERRY	KRZ
WENGE	WNG
NATURAL	NTR
PINK	PMB

Finally, the dimensions of the raw materials used shall be added by taking into account their diameters and lengths.

Step 3: Creating the smart code by combining the features of the raw materials (Figure 2)

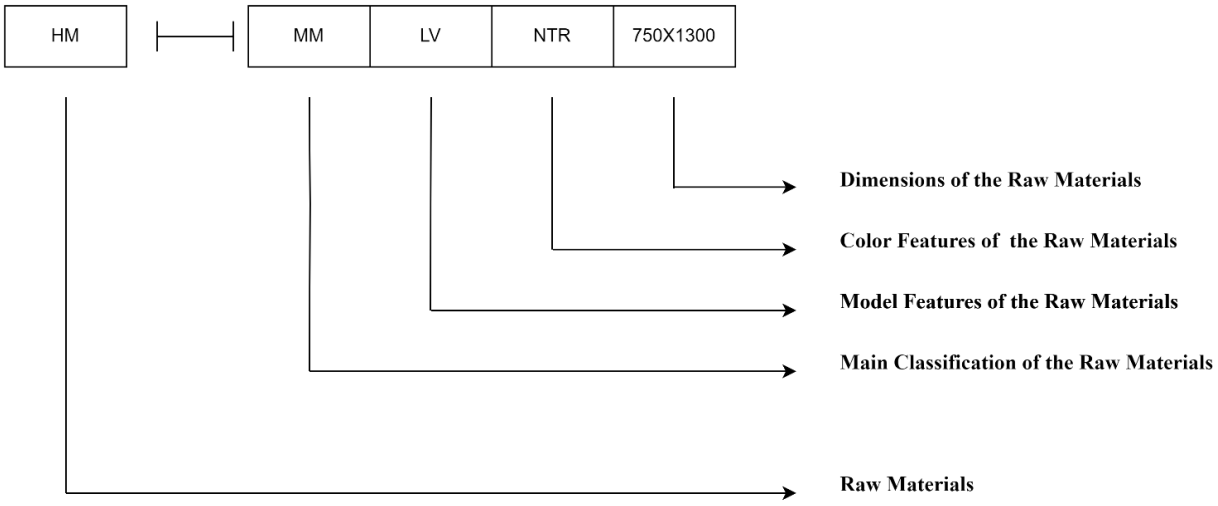

Figure 2. *Examples of Raw Materials Coding*

Meaning of the Code: Raw material made of MDL metal in the form of a sheet with a natural color and dimensions of 750 x 1300 mm.

3.1.2. Codes Created for Semi-Finished Products

Step 1: Determining the Features of Semi-Finished Products

Typical features that are considered significant in smart coding are as follows:

- Details about the main classification of the semi-finished products (wood, packaging, etc.)
- Model details of the semi-finished products
- Color details of the semi-finished products
- Perforation details of the semi-finished products
- Edge details of the semi-finished products
- Dimensions of the semi-finished products

Step 2: Defining the Specified Classification Features by Letters and Abbreviation

Firstly, the code 'YM'shall be included to indicate that it is a semi-finished product.

Secondly, the details about the main category of the semi-finished products shall be included. Table 4 presents some main categories.

Table 4. *Examples of Main Classifications and Abbreviations of the Semi-Finished Products*

Main Classification of Semi-Finished Products	**Abbreviation (InTurkish)**
MDL METAL	MM
MDL PLASTER	MC
PAINT	BY
FABRIC	KM
MDL SFTB	MS
MDL WOOD	MA
GLUE	TT
BEARING ELEMENT	TS
MATERIAL	ML
PACKAGING	AB

In two-word abbreviations, the second 'M' always stands for metal, the second 'A' stands for wood, and the second 'C' always stands for plaster.

In the third layer, the model features of the semi-finished products are coded. Some abbreviations used in coding are shown in Table 5.

Table 5. *Examples of Model Features and Abbreviations of the Semi-Finished Products*

Model Features of the Semi-Finished Products	**Abbreviation (InTurkish)**
HOOK-ON	HKO
CLIP-IN	CLI
BAFFLE COVER	BFK
WOODEN SLAT	AHC
T-24 BEARING ELEMENT	24S
FMX BEARING ELEMENT	FMX
EDGE PROFILE	KNP
FMX-5 PANEL	FMP
LAY-ON	OTR
T-15 LAY-IN	15S
HOOK-ON CORRIDOR	HOK
LAY-ON CORRIDOR	OTK
CLIP-IN CORRIDOR	CIK

The fourth layer of the code indicates the details about the color of the product. Since they are classified in the same way as the raw materials, it is not repeated here.

The fifth layer of the code indicates the perforation details of semi-finished products. Metal raw materials are processed under factory conditions, and perforation is the most important of these processes (Güler, 2019). In the production process, perforated products are produced with various hole structures. The types of perforation vary according to the customer's demands and the area where the product will be used. Even if it is thought that there should only be holes in perforated products, designs may sometimes include embossed or embedded items upon request, as seen in Figure 3. Therefore, perforation details are of great importance for suspended ceilings.

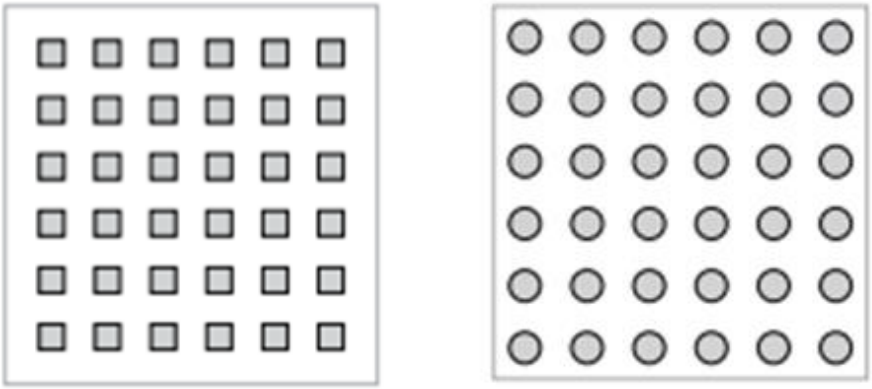

Figure 3. *Example of square and circle perforation with full edges in Table 4 (Tacer, 2023)*

At this stage, it was decided to take the initial letters of the most used perforation forms of the products. While the first letter stands for the shape, it was decided to write the dimensions of the perforation shape. If the first letter of the perforation shape has previously been used for another shape, the next consonant is used. Table 6 presents some semi-finished product perforation forms and abbreviation details.

Table 6. *Examples of Perforation Shapes and Abbreviations of the Semi-Finished Products*

Semi-Finished Product Perforation Forms	**Abbreviation (InTurkish)**
ALIGNED	S
IRREGULAR	G
STRAIGHT	D
ROUND	Y
SQUARE	K
DIAMOND	M
SPECIAL	Ö
OTTOMAN	O
TRIANGLE	Ü

In the seventh layer, the border properties of the products are specified. It refers to the finishes of the perforation holes, that is, how they are finished, on the edges of the ceilings where the perforation process is performed. In this field, the letter 'T' shall be written if the standard border finish is to be used; otherwise, the length to be left on the edge of the product shall be written.

Finally, the dimensions of the semi-finished products used shall be added by taking into account their diameters and lengths.

Step 3: Creating the smart code by combining the features of the semi-finished products (Figure 4)

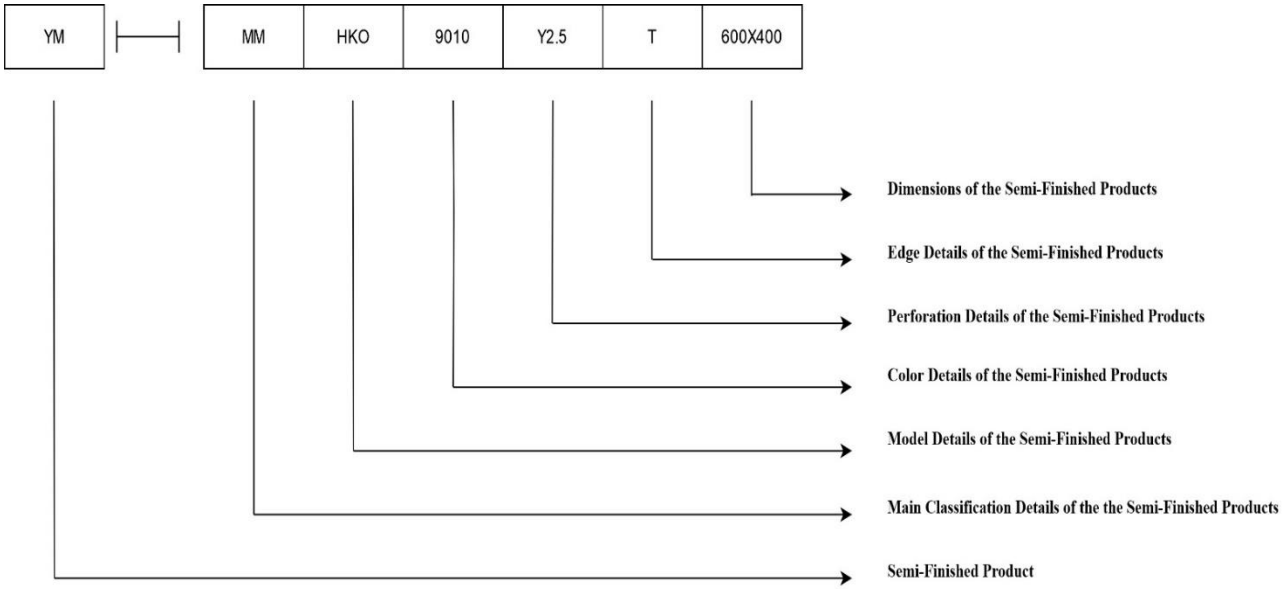

Figure 4. *Examples of Semi-Finished Product Coding*

Meaning of the Code: Hook-on bearing element suspended ceiling semi-finished product made from MDL Metal with full edges with dimensions of 600 x 400 and color of RAL 9010 with perforation of circles with a diameter of 2.5 mm.

3.1.3. Codes Created for Products

The company produces building products such as suspended ceilings and acoustic wooden ceilings. In this study, a smart coding algorithm was developed by examining the criteria that are considered essential to be known in the final products of the company.

Step 1: Determining the Features of Products

Typical features that are considered significant in smart coding are as follows:

- Details about the main classification of the products (wood, packaging, etc.)
- Model details of the products
- Color of products
- Perforation details of the products
- Edge details of the products
- Dimensions of the products

Step 2: Defining the Specified Classification Features by Letters and Abbreviation

Firstly, the code ‘M‘ shall be included to indicate that it is a product.

Secondly, the details about the main category of the products shall be included. Table 7 presents some main categories.

In general, these codes are used in the main classification process. The factor to be considered here is that the abbreviations have a certain algorithm. For example, as in the coding of raw materials, the second ‘C’ always stands for plaster, the second ‘M’ stands for metal, and the second ‘A’ stands for wood.

In the third layer, the model features of the finished products are coded. Some abbreviations used in coding are shown in Table 8.

Table 7. *Examples of Main Classifications and Abbreviations of the Products*

Main Classification of the Product	**Abbreviation (InTurkish)**
MDL METAL	MM
ACCESSORIES	AK
MDL WOOD	MA
BEARING ELEMENT	TA
MESH	ME
WAINSCOT WOOD	LA
WOOD	AH
HONEYCOMBS	PE
MDL PLASTER	MC
FABRIC	KU

Table 8. *Examples of Model Features and Abbreviations of the Products*

Model Features of the Products	**Abbreviation (InTurkish)**
HOOK-ON	HKO
CLIP-IN	CLI
BAFFLE COVER	BFK
BOX PROFILE	KTP
WOODEN SLAT	AHÇ
T-24 BEARING ELEMENT	24T
FMX BEARING ELEMENT	FMX
T-15 LAY-IN	15S
HOOK-ON CORRIDOR	HOK
LIGHTING BOX	AYK
LAY-ON CORRIDOR	OTK
CLIP-IN CORRIDOR	CIK
RINGS	RNG
WAINSCOT	LMB
HOOK-ON PLANK	HOP
LAY-IN	SRK
HOOK-ON BEARING ELEMENT	HOT
CURVED HOOK-ON CORRIDOR	EHK

The fourth layer of the code indicates the details about the color of the product. If there is no RAL code of the product, the abbreviation of the color of the product should be specified in this field. The colors were abbreviated in accordance with the abbreviation algorithm of the raw materials. More than one color tone can be used together in the products, so the abbreviation has been continued by placing '+' between them. Below are the abbreviations of some of the mostly used product colors.

The fifth layer of the code indicates the perforation details of the products. At this stage, the same algorithm created for semi-finished products was used. While the first letter stands for the shape, it was decided to write the dimensions of the perforation shape. Some abbreviations used in coding are shown in Table 9.

Table 9. *Examples of Perforation Shapes and Abbreviations of the Products*

Product Perforation Forms	**Abbreviation (InTurkish)**
ALIGNED	S
IRREGULAR	G
STRAIGHT	D
ROUND	Y
SQUARE	K
DIAMOND	M
SPECIAL	Ö
OTTOMAN	O
TRIANGLE	Ü

In the sixth layer, the border properties of the products are specified. The same border algorithm created for semi-finished products is used.

Finally, the dimensions of the products used shall be added by taking into account their diameters and lengths.

Step 3: Creating the smart code by combining the features of the products (Figure 5)

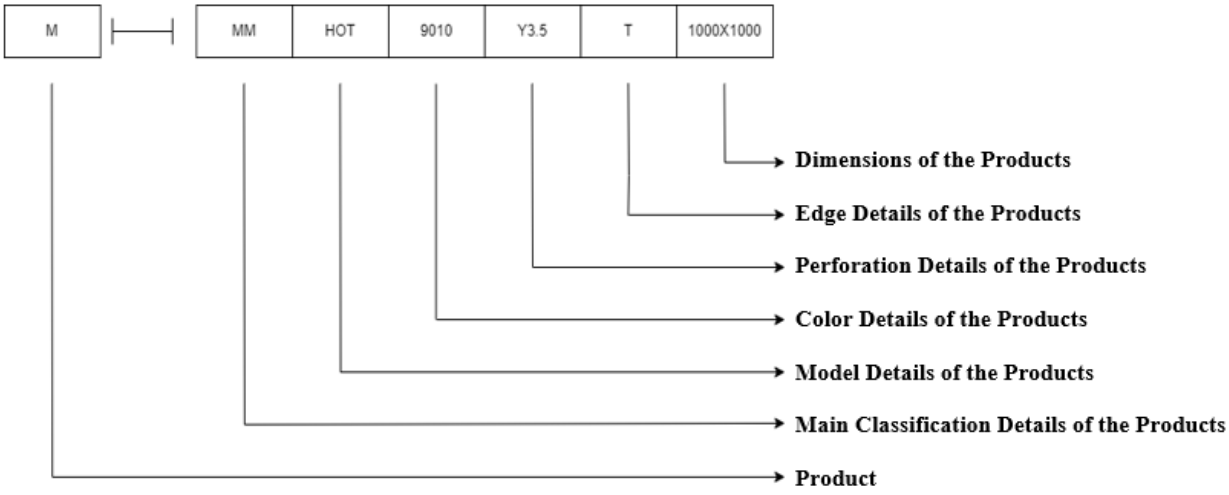

Figure 5. *Examples of Products Coding*

Meaning of the Code: Hook-on bearing element suspended ceiling product made from MDL Metal with full edges with dimensions of 1000 x 1000 and color of RAL 9010 with perforation of circles with a diameter of 3.5 mm.

3.2. Assigning Roles to Sales Representatives in the Company

Another improvement requested by the company is that the domestic sales representatives should not view the foreign companies and their quotes, and the overseas sales representatives should not view the domestic companies and their quotes. Due to the fact that domestic and overseas orders have radical differences in an order-based production company, the interfaces of the sales representatives have been simplified and any possible confusions have been prevented. Therefore, the ability to view records of the users defined in the CRM role definitions. A new role was created by duplicating the company and quotation role from the roles menu by using a new name. In the new role, permissions on reading and writing fields have been removed so

users can only read and write records that belong to them. Also, 'Object Permissions' is selected so that users can read the records according to the criteria, and only Read and Write permissions have been defined on the add criteria window (Figure 6). On the window that opens after closing this window, the code to be defined is written using the correct button by ticking the checkbox, thus the users are assigned the desired roles (Logo, 2023).

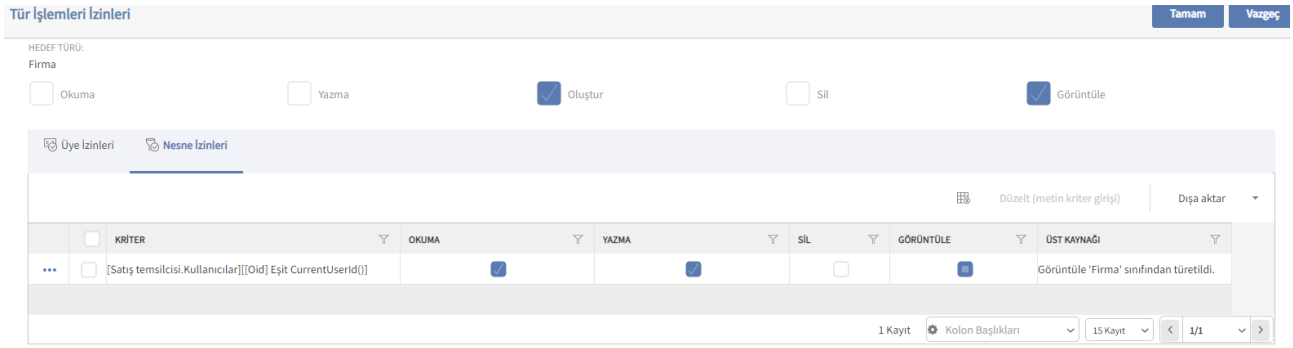

Figure 6. *Example window for defining roles where users can see only the companies belonging to the sales representatives assigned to this role*

3.3. Ensuring Instant Tracking of Inventory Available to Shipment

One of the biggest problems of the company is that there is a problem in the delivery times of the quotes created due to the fact that the sales representatives do not know the current status of the inventory. Sales representatives are able to follow up with the current inventory in Netsis after its integration with LogoCRM.

Although the actual inventory of the products by the warehouses can be seen on Netsis within LogoCRM (Figure 7), the customers request to be able to view the inventory available for shipment. The reason for this is that sales representatives cannot give a proper deadline to customers because they view the pending inventory during the order stage as included in the warehouse balances. In Netsis, a view was created where the general balance of the products at the order stage was calculated since the transactions are not conducted by leaving stock from the order.

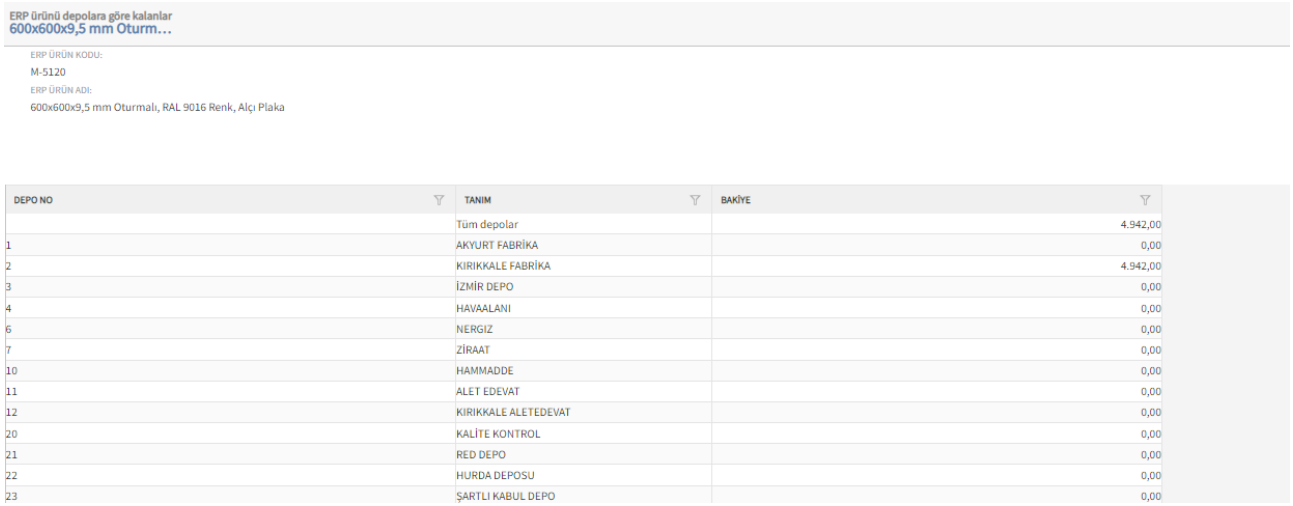

Figure 7. *View of actual inventory according to Netsis warehouses in LogoCRM*

REATE VIEW [dbo].[_YDS_SIPAYRI] **AS**

SELECT STOK_KODU,

KUMTOP

```
FROM
 (SELECT STOK_KODU,
       kumtop
  FROM (
       (SELECT STHAR_HTUR,
            STHAR_FTIRSIP,
            STOK_KODU,
Company_DOVTUT,
          (SELECT sum(x.sthar_gcmik-FIRMA_DOVTUT)
           FROM TBLSIPATRA AS x
           WHERE x.STOK_KODU=s.stok_kodu) AS kumtop,
            STHAR_GCMIK
       FROM TBLSIPATRA AS s
       WHERE STHAR_HTUR='h'
        AND STHAR_FTIRSIP='6'
       GROUP BY STHAR_HTUR,
            STHAR_FTIRSIP,
            STOK_KODU,
            FIRMA_DOVTUT,
            STHAR_GCMIK-FIRMA_DOVTUT,
            STHAR_GCMIK)) AS x) AS KML
GROUP BY STOK_KODU,
       kumtop
```

In YDS_SIPAYRI view, the inventory that has not been converted into waybills is calculated cumulatively from the TBLSIPATRA table where the order items are kept.

```
CREATE VIEW [dbo].[_YDS_SEVKEDILEBILIR] AS
SELECT PH.STOK_KODU,
     PH.DEPO_KODU,
     PH.TOP_GIRIS_MIK,
```

```
    PH.TOP_CIKIS_MIK,
    YDS.KUMTOP,
    (CASE
        WHEN YDS.KUMTOP IS NULL THEN PH.TOP_GIRIS_MIK-PH.TOP_CIKIS_MIK
        ELSE PH.TOP_GIRIS_MIK-PH.TOP_CIKIS_MIK-YDS.KUMTOP
    END) AS SIPAYRIBAK
FROM TBLSTOKPH PH
LEFT JOIN _YDS_SIPAYRI YDS ON PH.STOK_KODU=YDS.STOK_KODU
WHERE ph.depo_kodu='0'
```

In the _YDS_SEVKEDILEBILIR view, the inventory available for shipment is found by subtracting the remaining order balances from the TBLSTOKPH table where the total quantities of the inventory are kept. The reason for selecting depo_kodu=’0’ as a constraint in this field is that the total balance is kept in an imaginary warehouse number '0‘ to cover all warehouses, as well as the total balances are kept separately for each warehouse. The quantity of the inventory available for shipment for each warehouse is not important at this stage.

In the next stage, the inventory balances available for shipment in the_SEVKEDİLİRLİRSTOK view should be visible to the sales representatives for each product while adding the products to the quote on the LogoCRM interface. At this stage, a new balance field can be defined on the quoted products window, or a field that is considered unused may be selected among the existing ones and edited for this operation. In the study, an extra field from the extra fields in the inventory cards was defined (Figure 8).

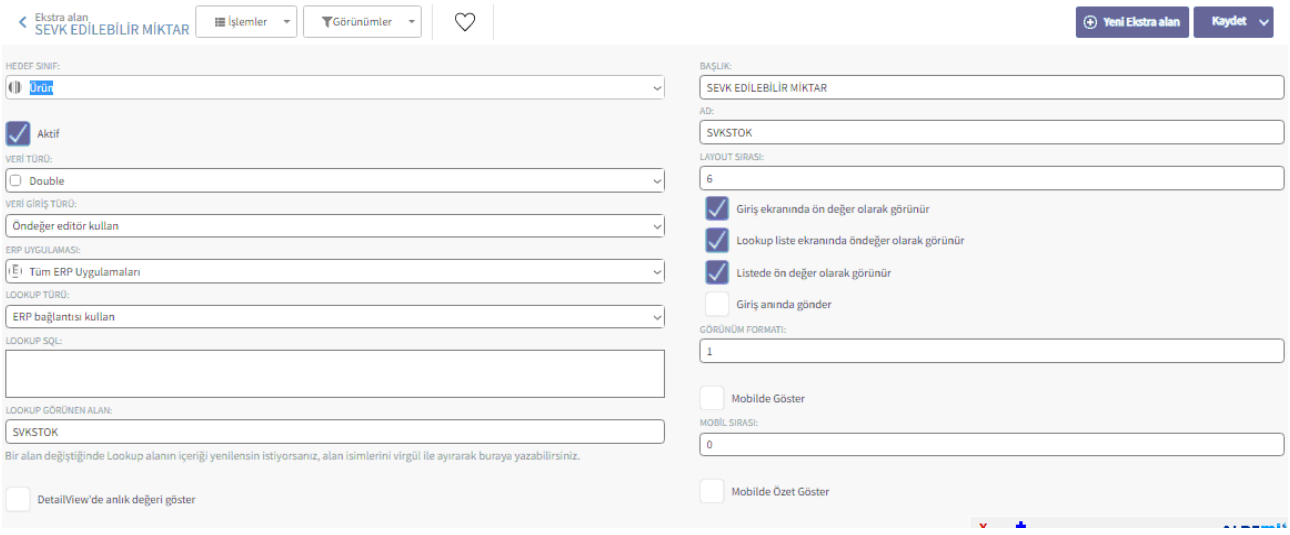

Figure 8. *Defining an extra field for the inventory available for shipment in LogoCRM*

The defined area is kept in the 'SVKSTOK' column in the 'MT_Product' table in the LogoCRM database, therefore, the fields are matched by writing the update sentence below. The 'COLLATE’ command was used due to language incompatibility between the Netsis database and the LogoCRM database.

```
UPDATE LOGOCRM.. MT_Product
SET logocrm..MT_Product.SVKSTOK=_YDS_SEVKEDILEBILIR.SIPAYRIBAK
```

FROM _YDS_SIPAYRIBAK

INNER JOIN LOGOCRM.. MT_Product **ON** _yds_sipayribak.STOK_KODU= Logocrm.. MT_Product.ProductCode

After completing the definitions, the reliability of the field was tested on a randomly selected stock.

As can be seen Figure 9, although the actual inventory of the product in LogoCRM system is zero, the inventory available for shipment seemed to be ' -8 '.

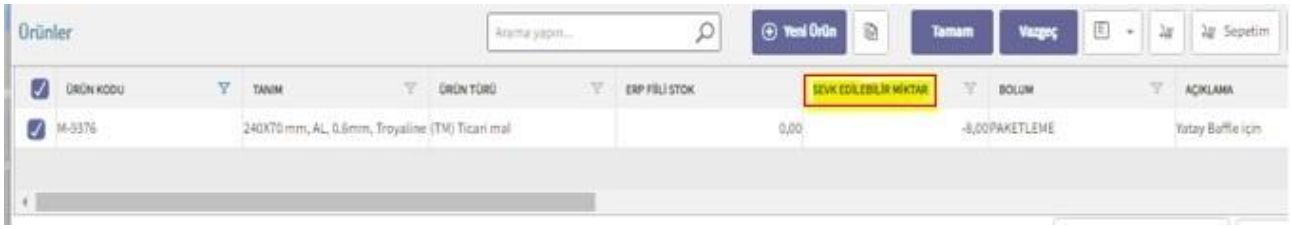

Figure 9. *Viewing the inventory available for shipment for a randomly selected stock using LogoCRM*

As can be seen Figure 10, the transaction report of the product generated by the Netsis system shows that the balance of the product is ‘0’.

Stok Hareketleri Dökümü

Rapor Seçenekleri

	A	B	C	D	E	F	G	H	I	J	K	L
1	Stok Kodu	M-9376	Ölçü Birimi	AD								
2	Stok Adı	240X70 mm, AL, 0.6mm, Troyaline Kapak, Ahşap Görünümlü TEAK (TCR-AD-10 003) (Yatay Baffle)										
3	Tarih	Fiş No	Tip	Fiyat	Giren Miktar	Giren Tutar	Çıkan Miktar	Çıkan Tutar	Kalan Miktar	Kalan Tutar	Açıklama	Depo
4					0,000	0,00	0,000	0,00	0,000	0,00		
5												
6												
7												

Figure 10. *Transaction breakdown report of selected stock in Netsis*

As can be seen Figure 11, in the detailed order report of the products generated by Netsis, there are 8 orders waiting for the shipment of the same stock. This confirms the reliability of our system.

Mal Bazında Müşteri / Satıcı Raporu (m-9376)

Rapor Seçenekleri

	A	B	C	D	E	F
1	Stok Kodu	Stok Adı	Cari Kodu	Cari İsim	Sipariş Miktarı	Teslim Miktarı
2	M-9376	240X70 mm, AL, 0.6mm, Troyaline Kapak, Ahşap Görünümlü TEAK (TCR-AD-10 003) (Yatay Baffle)	120-10-03642	BAREKS POLİETİLEN FİLM EKSTRUZYON SAN.TİC.A.Ş.	8,000	0,000
3	Bakiye Miktarı	0,000	Toplam		8,000	0,000
4						
5						
6						

Figure 11. *Detailed order report of the selected stock in Netsis*

The controls revealed that the process worked accurately; however, since the process consists of constantly changing data, a trigger has been added so that the 'MT_Product' table can be revised in accordance with the update written above after creating each order.

3.4. User-Friendly Interface Customizations

Another problem of the company was that the sales representatives could not view the technical specifications of the products conveniently while entering the product quotes. This problem has been solved by preparing a user-friendly and customized interface. The interface designs to be created are simple, they should be easy and understandable. (Yazar & Akpınar, 2022) Therefore, the fields in the LogoCRM interface have been arranged to make them user-friendly according to the demands of the sales representatives. Then, useless fields have been cleaned from the interface.

In Tacer company, the products are sold in two units: 'piece' and 'meter'. Therefore, in order to reduce the probability of sales representatives' making errors, the company requested to customize the interface according to the unit of the selected product. After opening the products on the ERP system and entering their unit of measure, they are integrated directly into the CRM system. Therefore, the units of the products sold can be confused by the sales representatives in some cases. In this section, the products from ERP were customized accordingly based on their units of measure on the interface in order to minimize the error. Tables containing the units of measure of the product cards were found in the database, and a trigger was written according to the data received from this table. In the product card, the value of the field 'Product Category-01' was arranged to write 'M2', i.e. square meters, for products with a unit of measure of area, and 'piece' for products with a unit of measure of number (Figure 12).

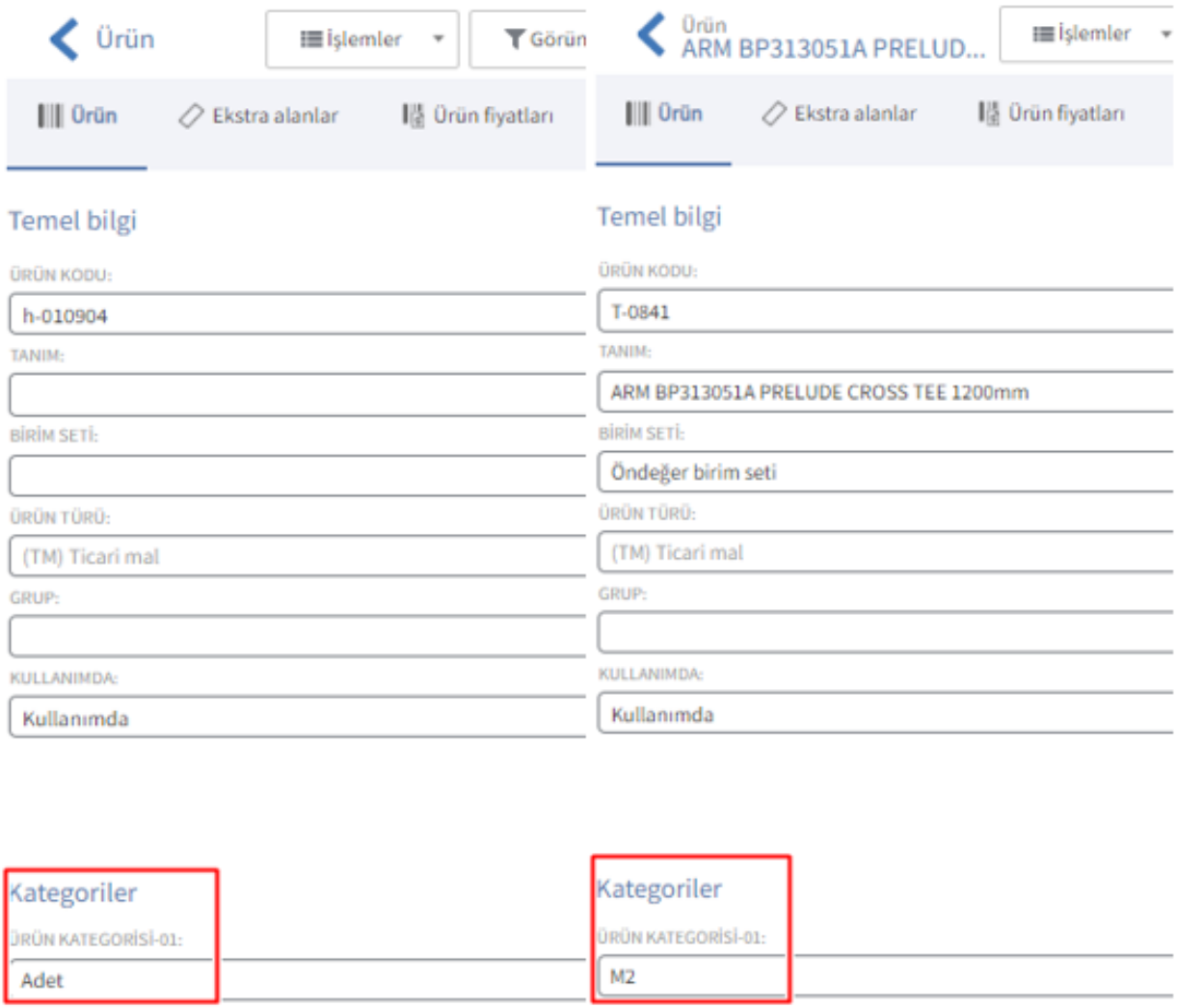

Figure 12. *Displaying the different units as 'm2' and 'piece' on product cards on LogoCRM interfaces.*

With this algorithm, the selected quote is displayed in units of measure customized. For these customizations, the necessary rules were created by defining criteria in the BO Model field and entering the AppereanceRules from the MT_Proposal_Product field through the ModelEditor (Figure 13).

With these customizations, the users were enabled to view the quoted products in their specific units of measure.

As can be seen Figure 14, the user enters the length and quantity details in order to m^2calculate the measure of products whose units are selected as meters. The ‘Length X Pieces’ field is passive for users, and its value is automatically assigned by calculating the values of the length and quantity fields.

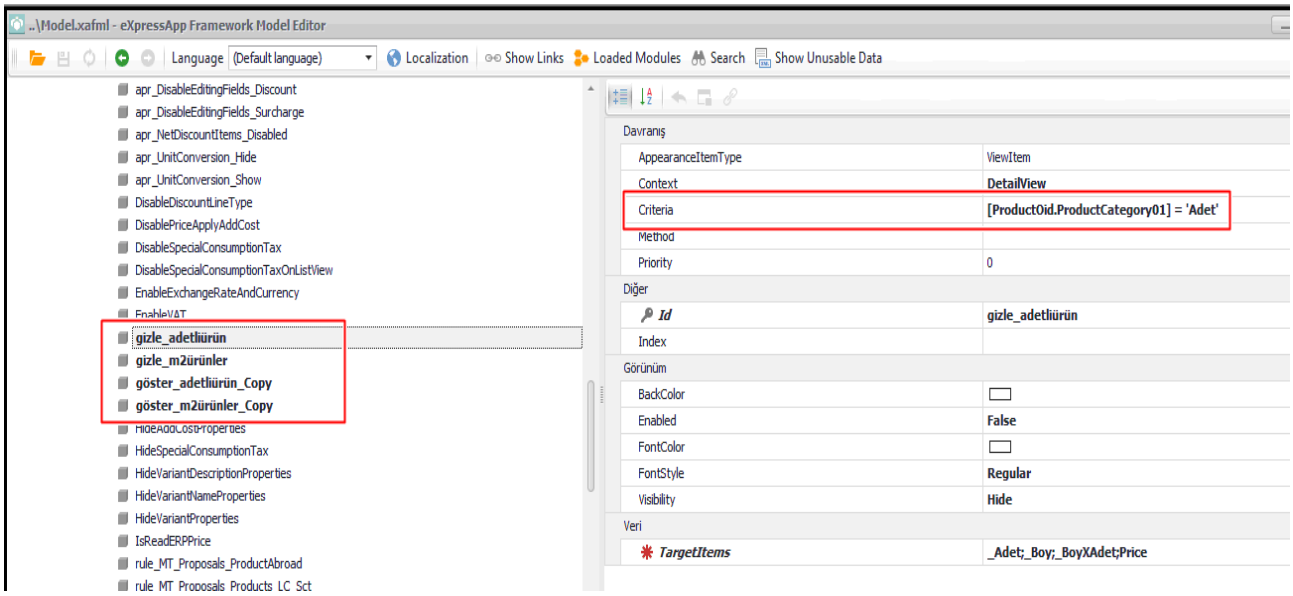

Figure 13. *Examples of customizations made on the model editor interface*

Figure 14. *Displaying the selected quoted products in units of meters*

As can be seen Figure 15, the products with a unit of measure of 'piece' only have the quantity field. As a result of these customizations, a user-friendly interface was created.

Figure 15. *Displaying the selected quoted products in units of piece*

4. CONCLUSION AND ASSESSMENT

The purpose of all enterprises is to maximize their profits and increase their production. Therefore, enterprises are in unending competition with each other. Today, enterprises that cannot adapt to technological transformation cannot survive in this competitive environment. Therefore, the Customer Relationship Management (CRM) system has to be used so that company managers can control customers and prospects to make it easier to manage transaction processes, product management, flagship projects and promotions for customers (Rahayu et al., 2022)

This study is conducted in Tacer company, which produces suspended ceilings in Ankara. Some problems in the company's ERP and CRM systems, which are used as a bridge between production and sales & marketing departments, have been eliminated after making assessments in line with the requirements of the company.

One of the biggest problems in the company is that sales representatives do not have a good command of the product cards because they are not involved in the production stages. Therefore, smart coding has been implemented for the products. A modeling study was carried out based on the most important features of the products required for the sales department. The LogoCRM interface is customized for sales representatives in a simple and uncomplicated way. In this way, human errors that may occur in the orders to be sent to production have been minimized. Moreover, users were allowed to get rid of unnecessary details by restricting their access to data under the control of the management.

The sales representatives were allowed to access the warehouse data in terms of inventory available for shipment and actual inventories. Thus, they were enabled to inform the customers correctly with realistic deadlines.

The study aimed to establish healthier relationships with the customers by making improvements in the processes between the departments of the company. As it is known, companies can increase their productivity only by applying CRM strategies, working continuously with their customers and having a high level of trust (Richards & Jones, 2008). The company aimed to increase customer satisfaction and get superiority in the competitive environment by establishing strong relationships with customers. After solving communication problems between the production and sales & marketing departments, the company has been recommended to purchase and use the Logo Flow workflow management software to follow the company's workflow processes in detail and to facilitate coordination not only between these two departments but also between all departments.

In the studies carried out to eliminate the communication problems between the sales & marketing and production departments in the enterprise, the dependence of these two departments on the purchasing department has been sufficiently understood. Therefore, suggestions have been made regarding the necessity of making improvements in the ERP and CRM systems by re-evaluating the connections between purchasing, production, and sales departments in the enterprise.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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