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Furniture Product Management System: An Evaluation Through the Case of "Chair"

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Abstract

Furniture is a set of important tools that enable individuals to perform their actions such as eating-drinking, sleeping, sitting-resting, working, etc., comfortably, and easily in people's daily life. The idea of furniture has emerged depending on human needs and through time improved and diversified depending on economic, social-cultural, and technological developments. The production of furniture products, which consist of products that have emerged to meet human needs, can be made with a "product management system" like all other products. This system, which can be called the furniture product management system, refers to a system in which all processes and sub-processes such as production, post-production, use, and post-use are planned and implemented, starting from the idea stage of the furniture. In this context, in the study, "furniture" was considered within the concept of "product" in terms of being a manufacturable object, and the product management system was adapted to furniture to construct furniture production processes within the framework of a well-organized concept. "furniture product management system" was presented as a model and the system was evaluated on the example of a chair.

Keywords: *Chair, furniture, furniture & function and space, product management system, furniture production process.*

Mobilya Ürün Yönetim Sistemi: "Sandalye" Örneği Üzerinden Bir Değerlendirme

Öz

Mobilya, insanın günlük yaşamını sürdürebilmesi diğer bir ifadeyle yeme-içme, uyuma, oturma-dinlenme, çalışma vb. eylemlerini rahat ve kolay gerçekleştirebilmesini sağlayan önemli araçlar bütünüdür. Mobilya fikri, insan gereksinimlerine bağlı olarak ortaya çıkmış ve zaman içerisinde ekonomik, sosyal-kültürel, teknolojik vb. gelişmelere bağlı olarak gelişip çeşitlenmiştir. İnsan gereksinimlerinin karşılanması amacıyla ortaya çıkmış ürünlerden oluşmuş olan mobilya ürünlerinin üretimi, diğer tüm ürünler gibi "ürün yönetimi sistemi" ile yapılabilmektedir. Mobilya ürün yönetimi sistemi olarak adlandırılabilecek olan bu sistem, mobilyanın fikir aşamasından başlayıp, üretim, üretim sonrası, kullanım ve kullanım sonrası gibi tüm süreç ve alt süreçlerin planlama ve uygulanmasının yapıldığı bir sistemi ifade etmektedir. Bu bağlamda, çalışmada, "mobilya", üretilebilir bir nesne olması noktasında, "ürün" kavramı dahilinde ele alınmış ve mobilya üretim süreçlerinin iyi organize edilmiş bir konsept çerçevesinde kurgulanması adına, ürün yönetim sistemi mobilyaya uyarlanmıştır. "mobilya ürün yönetimi sistemi" bir model olarak sunulmuş ve sistem sandalye örneği üzerinden değerlendirilmiştir.

Anahtar kelimeler: *Sandalye*, mobilya, *mobilya & işlev ve mekan, ürün yönetim sistemi, mobilya üretim süreci.*

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1. Introduction

For human beings to survive and ensure the continuation of their generation, they had to be protected from climatic and natural conditions, and this situation revealed the need for shelter. The search for man's need for shelter started with caves, and in the historical process, with the discovery of nature, environment, and “self ”, continued with the places which were created by using natural materials, The fact that people meet their need for shelter and start living in the places they have created has laid the groundwork for the formation of commodities for different needs and various products and goods called “furniture” in the living space (Başbuğ, 2016). Furniture design and production is a complex process that involves a range of creative and technical skills, as well as an understanding of materials, manufacturing techniques, and market trends.

Product management is a critical function for furniture production that seeks to create and maintain a competitive advantage in a dynamic market environment and modern businesses, and its importance is expected to grow in the coming years. The role of product management is to identify production processes, market opportunities, define product requirements, and guide development efforts to create products that meet customer needs and generate revenue.

Based on this framework, this study presents a review of the academic literature on furniture production, product management, and business success, summarizing key insights from the research findings. The analysis highlights the essential role of product management in creating innovative products in the furniture sector that meet customer needs and exceed expectations. The review provides a roadmap for companies seeking to enhance their product management capabilities and processes, highlighting the broad range of skills and processes required to succeed in this critical function.

In this context, in the study which has been based on the master’s thesis prepared by the first writer under the supervision of the second writer, “furniture” as a furnishing element and equipment, will be discussed through the evaluation of the “furniture product management process” model at the point of its impact and importance in design and application disciplines, and eventually, the model will be applied on a furniture sample. It is within the scope of the study that the product management processes are examined and the "furniture product management" processes created in parallel with this, the correct design, detailing, evaluation, and all of these on a chair example.

2. Material and Method

In line with the problem area of the study; literature research on furniture production, product management, and business success, using a three-stage search process has been conducted. First, relevant keywords related to product management, business success, and related areas, such as marketing and innovation have been identified. Second, a comprehensive search of electronic databases such as ULAKBİM, Google Scholar, JSTOR, and EBSCO, using the identified keywords has been made. Third, the results of selecting articles that met pre-defined inclusion criteria, such as peer-reviewed, English language, and published within the last ten years have been screened. Afterward, the works have been followed on-site by participating in the production methods as an observer in the furniture production areas (furniture studios) and at the same time by visiting many furniture stores. In this direction, the study was designed within the research model presented in Table 1.

The study aims to evaluate the “furniture product management” processes in light of the information obtained by examining the product management and product cycle. The examinations of the effects of the “furniture product management system” on the point of observing the problems that occur in production, determining the reasons for the deficiencies and malfunctions, increasing the efficiency, what measures can be taken to ensure that the production process is healthy and in the determined line, and within this scope, the investigations of the effects and the possible benefits a furniture produced with the determined management processes can provide to the manufacturer and the user, is the main goal of the study.

In the study, it is thought that this thesis will make an important contribution to the furniture production sector by researching, creating, and evaluating the "furniture product management" processes that are created depending on the product management processes.

Table 1. Research model

Process of the Research	Stages of the Research	Scope of the Research
Data Collection	Literature Research	Furniture and Related Terms & Concepts Scope and Characteristics of Furniture Production Process Content Analysis of the Data Obtained during the Literature Research Process
Data Reduction	Literature Research Adaptation of the Model	Content Analysis of the Data Obtained during the Literature Research Process Creating the Conceptual Framework Detection of Problems with Document Scanning and On-Site Observations
Data Display	Adaptation of the Model	Adaptation of the Model Visual Representation of Obtained Data
Conclusion Drawing & Verifying	Analysis Using the Model Results & Findings	Analysis of Obtained Data Results and Evaluation

3. Findings and Discussion

In this section, first of all, the features and components of furniture, which is one of the most important design elements of interior architecture, will be discussed and the production process will be explained. The product management process and the furniture production management system to be followed in this context are defined and its features are specified. The relationship between product management and product cycle and sub-systems in this context has been explained, and the furniture production management system has been applied to the chair.

3.1. Furniture

Furniture is defined by Türk Dil Kurumu (2023) as “all portable items used for furnishing places to sit, eat, work or sleep”. Although the word furniture means a mobile item that can move with a mobile, it is generally considered an equipment element (Tütüncü, 2011). According to another definition, furniture is defined as all the functional, ergonomic, and aesthetic-looking items that are generally made of wood material to meet the social, cultural, and basic needs of people for their daily life safely and comfortably (Tatlısu, 2015). The concept of furniture can be mentioned since the early ages when people started to meet their spatial life needs with tools and goods. Furniture has changed over time in parallel with the living conditions, understanding of civilization, and aesthetic views of societies and has taken different forms (Üst, 2015).

Furniture design has a long and rich history, dating back to ancient civilizations such as Egypt, Greece, and Rome. The ancient Egyptians, for example, were known for their elaborate furniture designs, which featured intricate carvings and ornamentation. During the Middle Ages, furniture design was primarily focused on functional rather than aesthetic considerations, with most furniture being simple, utilitarian pieces. In the 18th and 19th centuries, furniture design underwent a major transformation, with the advent of new materials such as cast iron and steel, and the development of new manufacturing techniques such as the mass production of furniture. This led to the creation of new styles such as Art Nouveau and Art Deco, which were characterized by their ornate and stylized designs.

When examined in terms of its historical development, examples of furniture in different shapes and varieties are encountered from ancient times to the present. In the first shelters, human beings used a number of items to meet their sitting and lying needs. To obtain an item, man has followed nature to "choose" and "make the same" of what he has chosen. In later processes, it was seen that he

developed his creativity by adding his creativity to the items he made by analogy. While people's furniture production was only a necessity in the past, furniture has started to be seen not only as a necessity but also as a prestige tool. As the importance of furniture increased, furniture-making began to be accepted as a profession, and this acceptance is thought to have occurred in cultures such as ancient Egypt and Mesopotamia (Sönmez, 2011).

Today, when furniture is evaluated in terms of its meaning and importance in human life, first of all, it is observed that furniture is an important product that meets all other needs, especially the basic needs of people, and makes human life much easier. At the point of user satisfaction, universal comfort criteria and changing consciousness, perception, and principles have also led to the emergence of different perspectives in furniture design and production. Comfort parameters require a special design in terms of furniture and materials (Bilmez, Çelik, Diri & Arpacıoğlu, 2022).

In addition to the design approaches created for new needs, functions, and comfort conditions, furniture has started to be evaluated on a different level, especially with the changes in material variety, quality, and technology. Topal & Arpacıoğlu (2020) stated that before the Industrial Revolution, materials were chosen both pragmatically - for their benefits and usability - and procedurally for their appearance and decorative qualities, besides, it is a determining criterion in the material selection that evaluates the material possibilities at hand, that is, designs made according to a certain concept and function, as well as certain materials. After the Industrial Revolution, the role of materials changed significantly, and architects have begun to face industrial materials instead of relying on an intuitive and experimental understanding of material properties and performance (Topal & Arpacıoğlu, 2020).

When it comes to furniture, the first thing that comes to mind is wooden furniture. The furniture that people need the most is generally; a bed, armchair, table, chair, cupboard, corner set, pouf, nightstand, bookcase, coffee table, school desks and desks, office tables and chairs, patient beds, counters, etc., and mostly wooden materials are used in this furniture. Today, although other materials such as steel, aluminum, glass, and plastic have been used in furniture making, wood remains popular in this regard. Wood material is preferred more in furniture production due to its features such as being easily processed, easily combined with each other, having a high resistance, being easily changed when old, and being painted (Kayapınar, 2011).

3.1.1. Types of furniture

It is seen that furniture is generally divided into two indoor furniture types and outdoor furniture types. Indoor furniture types are generally used in building types such as residential, hospital, school, hotel, office, cafe-restaurant, etc. Outdoor furniture types include urban furniture used in public areas, such as parks, gardens, forests, etc., which are defined as open spaces. The most important feature that distinguishes these two types of furniture from each other is that the furniture is directly affected by climate and natural conditions or is not affected by these conditions at all.

While the furniture used outdoors is directly exposed to rain, snow, wind, frost, humidity, and heat, the furniture used indoors is not affected by external environmental conditions. For this reason, the materials used in indoor and outdoor furniture are quite different from each other. While the materials used in outdoor furniture that are directly exposed to seasonal and environmental conditions are concrete, durable wood, iron, casting, etc., the materials used in interior furniture are wood, plastic, glass, aluminum, plastic, etc.

Another situation that distinguishes these two types from each other is the frequency of use of the furniture depending on the number of users. Frequency of use plays an important role in the strength and durability of furniture. For example, when this situation is evaluated in terms of seating units, there is a lot of circulation of people in the park during the day, so the number of people using the seating unit used in the park during the day is considerably higher than the number of people using the seating unit used in the house. From this point of view, it is seen that the durability of a seating unit used outdoors is higher than a seating unit used indoors.

People meet their sheltering needs through different building types. In this context, furniture used in building types is defined as *interior (indoor) furniture*. Building types are generally residential, office, school, hotel, hospital, cafe-restaurant, theater, cinema, etc. and almost all of them have their special furniture types. For example, a school is a type of building where studying and listening activities take place, and the types of furniture used in these buildings are usually desks, chairs, trainers' chairs, waiting-resting chairs, storage, etc. Considering another type of building, residential furniture is a wardrobe, armchair, coffee table, table chair, dresser, bed, nightstand, sideboard, kitchen cabinet, bathroom cabinet, wing chair, corner set, etc. When evaluated from this point of view, the spatial identities of the building types and the actions and needs of the user in the space determine the shapes and types of indoor furniture types.

Urban areas are the areas open to the use of society where people come together, socialize and spend time together. In outdoor spaces, people need some equipment. This equipment is benches, picnic tables, camellia, pergolas, children's play sets, sports equipment, garbage cans, lighting elements, etc. and these items are defined as urban furniture or outdoor furniture (Feyzioğlu, 2008). In all open spaces of the city, which are called outdoor spaces, mostly fixed service sets and structures for various open space functions, where the user is uncertain, are called urban furniture. *Outdoor (urban) furniture*, together with the concept of the city, are products that are intended to meet the evolving needs of users as a result of certain processes.

3.1.2. Production of furniture

“Production” is defined as “soil, animals, plants, etc. the job of providing products, introducing new things as goods and services, producing them” and “the activities and process of people changing their natural environment to obtain objects necessary for the life and development of society” (TDK, 2023).

Furniture production is generally grouped under two headings, and these are called “mass production” and “special production”. The main feature of this type of production, which is applied in units with a high production amount but low product variety, is the concentration of machinery, facilities, and product flow on a specific product. Furniture produced with the mass production system is furniture that can be produced in large numbers, is frequently encountered, and is always available many times. Special production, on the other hand, is the name given to the system that produces a limited number of products from a product that is desired to be created depending on the requirement. Special production furniture is a more boutique production form compared to mass production, and therefore, it is a system that allows the creation of a limited number of personalized and more original furniture in line with special demands (Başbuğ, 2016).

Today, the furniture design and production industry are a major global market, with a wide range of products and styles available to consumers. Some of the most popular styles of furniture today include contemporary, traditional, and transitional, with designers and manufacturers increasingly focusing on sustainability and eco-friendly materials. One of the biggest challenges facing the furniture industry today is the competition from low-cost suppliers in countries such as China and Vietnam. This has led many designers and manufacturers to focus on higher-end and custom furniture, as well as on new technologies such as 3D printing and augmented reality.

Furniture production generally has a batch production system. There are imbalances between operations in the discrete production system. Performance losses caused by this imbalance (length of lead times, inability to deliver orders on time, low-capacity utilization rates, etc.) can be eliminated by keeping intermediate stocks high or by making a balanced production with effective scheduling methods and product-oriented reorganization measures (Sütçü, Karşıyaka & Burhan, 2019). The importance of the Turkish furniture industry in the national manufacturing industry is increasing day by day. The sector earned 3.1 billion dollars in foreign exchange in 2018, gave a foreign trade surplus of 2.3 billion dollars, and set an export target of 6 billion dollars for 2023 (Orsiad, 2019).

In this context, the production stages of the furniture to be produced should be planned, both in terms of the volume and importance of the furniture industry and the problems of the production system, and the problems that may be encountered during the production stage should be taken into account

while still in the planning stage. It is an important point to ensure the continuity of the production process while solving the problems at the same time. In terms of the systematic and planned sustainability of the process, the use of the product management system in furniture production is considered an important point.

3.2. Product Management

"Product" is defined as "the useful thing obtained from nature, the crop" and "the thing obtained by processing raw materials in various industrial areas" (Türk Dil Kurumu, 2023). Product management, which consists of the combination of product and management concepts, covers the definition, planning, and implementation of the production processes of the products depending on a certain order and system.

The product management system is the organization of responsibilities, duties, and employees to market a product or brand. The main purpose of product management is for the organization to be successful in its marketing activities, in other words, to make a profit while selling its products or brands (Ataman, 2006). In the product management system, there must be a "product manager" to plan all stages of the product or to carry out the existing planning, application, post-application, and all other stages as determined and desired. When evaluated in this respect, it is seen that the product manager has an important place in the product management system.

Product management is a critical function for businesses of all sizes and industries. Product managers are responsible for identifying market opportunities, defining product requirements, and guiding development efforts to create products that meet customer needs and generate revenue. The role of product management has evolved significantly over the years, reflecting changes in customer expectations, technological advancements, and business trends.

The management process, in general, includes all stages of a business, from the idea stage to the implementation, planning, and managing of the plans, and when all these come together, it creates a cycle. When this cycle is considered in terms of product management, it is expressed as a "product life cycle" in many sources. This definition, called product life cycle, was created based on the concept of "life cycle". The life cycle is a system that evaluates all the environmental aspects of action until the raw material is obtained from nature and all the waste is returned to nature. This system includes the production and use of raw materials, including energy, as well as the processing of the product, and all its effects on air, water, and soil afterwards (Özdemir, 2013). Based on the life cycle system, it is seen that definitions such as "product life cycle" and "product cycle" are made for the system created to obtain products.

3.2.1. Product cycle system

The model is an abstracted form of the system or systems, developed to understand the system, which is defined as the coming together of interrelated components and representing reality. In addition, the model, which is the representative of an ideal environment and is a summary or representation of a real situation, including the variables that are considered important, is not only a representation of all the features of the real situation but rather aims to determine the important components and relationships of the system. In short, the complex and difficult processes of the real system are presented by simplification with modeling (Erdinç & Biçer, 2020).

Based on this understanding, Biçer Özkun (2011) presents and defines the "product cycle system", which was presented as a model in her doctoral study, as a system consisting of 4 phases (sub-systems) interacting with each other; production, application, utilization, and post-utilization. This system, which is defined as the product cycle, can be adapted and used for every product that can be produced.

The "production" subsystem, which is the first stage of the product cycle; consists of the pre-production process, which includes the design of the product and the sub-processes of raw material preparation, and the production process, which includes the sub-processes of production, packaging, storage, and sales. Application subsystem; includes the pre-application process, which includes transportation and storage sub-processes, and the application process, which includes on-site and pre-

production and application sub-processes. The utilization subsystem; is carried out within the pre-use process, which includes replacement and addition sub-processes, and the usage process, which includes maintenance, repair, and replacement-renewal sub-processes. The post-use subsystem is consists of the post-use process, which includes the sub-processes of leaving in place, dismantling-demolition, and re-evaluation (Biçer Özkun, 2011). According to Biçer Özkun (2011), the “product cycle system” progresses within a certain flow, in a certain order, and within the framework of the continuity and relations of the stages.

3.3. Furniture Product Management System in the Context of Product Management-Product Cycle Relationship

The product management system is considered a convenient system that can be adapted to almost every product and used in different disciplines and applications. The point that furniture is also a product, is seen that all the processes of the product management system can be used under the definition of "furniture product management system" by adapting and applying the typical and unique characteristics of furniture.

The content of the customization of the model has been created with the idea of developing the "furniture product management system and phases" by going through an adaptation process, as well as associating the product management system and phases with the furniture and furniture production process. In this context, a “furniture product management system” can be defined as a system that covers all processes and sub-processes, starting from the design stage of any furniture, such as production, application, utilization, and post-utilization.

3.3.1. Production subsystem and processes of furniture

It includes all phases from the ideation stage of the furniture until it is ready for production. Furniture production system titles cover the processes including the function, raw materials, production method, and facility of the furniture, how it will be packaged, how it will be stored, and how it will be transported.

Functioning Process: Clarification of the function of the furniture also constitutes an important step in how and through which stages it will be produced. At the point of their different functions, it causes many processes of bed and table to be different.

Raw Material Process: It covers the procurement of the raw material of the furniture planned to be obtained and making it ready for the production process. For example, the raw materials of a chair that is planned to be produced with wooden material and a chair covered with leather are different from each other. This situation may cause differences in the raw material processes of the furniture.

Production Process: It covers the processes of establishing the production facility or rearranging the existing production facility depending on the furniture and making it suitable for production after it is clarified how the furniture will be produced (mass production, special production).

Packaging Process: It is the process of packaging the furniture, in other words, protecting it, and this process may vary depending on the material of the furniture. For example, the packaging of a wooden chair and a glass showcase requires more precision in packaging because the material of the glass showcase is more fragile than the chair.

Storage Process: It includes the processes where the furniture, whose packaging process is completed, is taken to protection and stocking. For example, the volume of the space where the furniture will be stored should be adjusted depending on the size of the furniture and the amount of stocking. In addition, factors such as the sensitivity of the furniture to temperature and storage time may differ in the processes.

Shipping Process: It includes the processes of moving the furniture out of stock to the dealers for sale or to the point of sale. For example, the handling and sensitivity of a glass coffee table and a wooden coffee table are different from each other. Naturally, this situation creates a difference in shipping processes.

3.3.2. Application subsystem and processes of furniture

It is the stage where the production phase of the furniture is completed, and the application process is started. It covers the processes such as moving the furniture from the factory warehouse or the warehouse of the sales store to the application center and storing (storing, protecting) in this center until the installation period.

Receipt Process: In this step, the purchased furniture process includes the steps of being picked up from where it is, transported to the point where the application will be made, and delivering it to the buyer.

Storage Process: It is the process of protecting and storing the furniture, which is transported to the application center after the transportation process until the application is made in this center.

Installation Process: It is the process of moving the furniture, which is about to be applied, to the installation phase by removing it from its storage place.

3.3.3. Utilization subsystem and processes of furniture

The systems and processes that emerge with the user's access to the furniture and starting to benefit from it are called the furniture utilization subsystem and processes. These processes include sub-processes such as furniture modification, utilization of furniture, and furniture maintenance and repair.

Modification Process: Before starting to use the furniture, the user may want to use the furniture by making various changes depending on his needs. For example, by mounting additional shelves on a piece of furniture used as a desk, the desk can also be used as a bookcase, in other words, a multitude of functions can be achieved in furniture.

Utilization Process: This process, which can also be defined as the process in which the relationship between the user and the furniture begins, includes the processes in which the furniture meets the user's expectations, and the user obtains the expected efficiency from the furniture.

Maintenance and Repair Process: Due to the occurrence of various problems such as wear, breakage, cracking, and staining during the use of furniture, processes such as maintenance and repair can occur in furniture.

3.3.4. Post-utilization subsystem and processes of furniture

The after-use subsystem and processes of furniture that have completed their life form the last step of the furniture product cycle. Furniture that has expired is replaced by a new piece of furniture with a similar function. Depending on the suitability or condition of the old furniture, its function can be changed, giving it a new function and reuse. In cases where it loses its usability and no transformation is possible, the disassembly-dismantling process begins. After the disassembly-disposal process, furniture waste can be re-evaluated through the recycling process, depending on its material.

Refunctioning Process: After the furniture loses its first function, it may be desired to be reused for another purpose. At this stage, the furniture is re-functionalized and this process; can be done by adding, removing parts, changing the color, or the surface coating.

Disassembly-Disposal Process: It includes processes such as disassembling the furniture, which has completed its useful life, and throwing it away as waste.

Recycling Process: The recycling process of waste furniture not only helps prevent environmental pollution but also ensures the use of recycled waste as raw materials.

3.4. Application of the Model of Furniture Product Management System Through “Chair”

Although the stages are generally the same, there can inevitably be differences in the sub-processes of the furniture product management system, in line with different characteristics in furniture in terms of the design stage, form, material, installation, etc. While the steps of the furniture product management system can be adapted to each piece of furniture, this may cause some differences in

sub-processes. For example, furniture product management sub-processes of seating furniture with similar functions and used indoors may vary. There may be different sub-processes between the wooden chair and the leather chair. Because, although the function of the wooden chair and the function of the leather chair are the same, raw materials, production, packaging, assembly, maintenance/repair, etc. differ in sub-processes. In this context, the model of the furniture production system has been applied to the "chair" as it has been presented in the table (Table 2) below.

Table 2. Evaluation of the furniture product management system on "chair"

PROCESS / PRODUCT			
Production Subsystem and Processes of Furniture			
Functioning Process	Seating	Seating	Seating
Raw Material Process	Sponge, Leather, Metal, Wood	Wood, Lacquer etc.	Plastic
Production Process	Mass Production Format	Mass Production Format	Mass Production Format
Packaging Process	Modular Packaging Format.	Modular Packaging Format	Individual Packaging Format
Storage Process	Protection and Storage in Packages	Protection and Storage in Packages	Protection and Storage in a Single Package
Shipping Process	Careful Handling	Careful Handling	Careful Handling
Application Subsystem and Processes of Furniture			
Receipt Process	Delivery of the chair without damage	Delivery of the chair without damage	Delivery of the chair without damage
Storage Process	Pre-Installation Storage and Protection	Pre-Installation Storage and Protection	No Installation, No Storage Required
Installation Process	Reuniting and Assembling the Parts	Reuniting and Assembling the Parts	In one piece, no assembly is required
Utilization Subsystem and Processes of Furniture			
Modification Process	Replacing Metal Legs with Wood	Darkening with Lacquer	No Adding, Subtracting, or Color Changes Can Be Made
Utilization Process	Indoors, As Seating Furniture (Chair)	Indoor Use as Seating Furniture (Chair)	Using as Outdoor Seating Furniture (Chair)
Maintenance and Repair Process	Breaking, Tearing, Scratching, etc.	Breaking, Cracking, Scratching, Color Fading, etc.	Breaking, Cracking, Scratching, etc.
Post-Utilization Subsystem and Processes of Furniture			
Refunctioning Process	Removing the Metal Legs, attaching them to a Wooden Surface, and Using them as a Coffee Table	The Backrest Can Be Removed, Darkened with Varnish, and Reused As a Coffee Table	It is not re-functional due to being a one-piece, plastic material
Disassembly-Disposal Process	Requires Disassembly, Discarded in Pieces	Requires Disassembly, Discarded in Pieces	No Disassembly is Required, Discarded as One
Recycling Process	Can Be Converted as Metal Scrap. Again, the wood in the chair can be recycled as waste	Wood Can Be Converted as Waste in Factories And Used As A Raw Material Of Particle Board	Plastic can be converted as waste in factories and used as raw material for sewage pipes

4. Conclusion and Suggestions

The product management system is known as a system that can be used for every product that can be produced. Furniture within the scope of the product can also be produced using this system. While adapting it to furniture, all processes within the "furniture product management" system, which was created by utilizing the "product cycle system" designed by Biçer Özkun (2011), were used. The purpose of creating the furniture product management system and processes is to determine the purpose and where the furniture will be used, to prevent possible confusion in planning and application, and to minimize risks. In addition to adapting the system to furniture, considering the case of the chair is considered important in terms of controlling the applicability and adaptability of the system and processes. As a result of the evaluation, the furniture product management system and the benefits and conveniences of the processes such as production, application, utilization, and post-utilization within this system are described below.

The benefits of furniture product management system and processes to furniture production are as follows:

- Build planning on clear and realistic data.
- Creating the furniture by the requirement.
- Completing the cost of furniture at the end of production by the budget or with the least risk.
- To create an infrastructure suitable for production with the determined production method.
- To ensure that the furniture's raw material is procured and prepared by the process.
- To continue the production process in the determined line.
- To make the packaging format by the fragility of the furniture material.
- Ensure that the furniture is stored for protection and storage purposes, depending on its size and sensitivity to temperature.
- To carry out the transportation process without any problems to the center where it is sold or to be moved to be sold.
- To ensure the correct installation of the furniture in the application center.
- To be able to obtain the expected efficiency from the furniture in the usage process.
- To ensure the reuse of furniture by re-functioning.
- Dismantling and discarding furniture that has completely lost its function.

In addition, the benefits of the furniture product management system to the furniture manufacturer/seller can be specified as;

- Making the process easier with the clarification of the design steps.
- Prevention of cost loss by cost planning.
- Preventing loss of cost and reputation by using the time correctly.
- Increasing the quality of furniture.
- The demand for furniture in the market and the continuity of demand.
- The producer's economic gain from the product.

The benefits of the furniture produced with the furniture product management system to the user are listed:

- Provides the functionality of the furniture to the user's needs.
- The quality of the furniture has provided service to its users for many years.
- Cost-effective production provides ease of purchase.
- Extends the life of furniture with maintenance and repair.
- After completing its function, it can be re-functionalized and used.

The study has uncovered the following key insights:

- Effective furniture product management is essential for organizations to achieve competitive advantage by creating innovative products that meet customer needs and exceed expectations.
- Successful furniture product management requires a broad range of skills, including customer empathy, strategic thinking, technical expertise, and effective communication with cross-functional teams.
- Effective furniture product management processes require close collaboration between product managers and other functional areas such as marketing, engineering, and sales.
- Companies that invest in product management methods, capabilities, and processes are more likely to achieve business success than those that do not.

In conclusion, furniture design and production are a complex and evolving industry that requires a range of creative and technical skills. From its ancient origins to the present day, furniture design has undergone significant transformations, with new materials, manufacturing techniques, and design styles continually emerging. Emerging technologies and new product management methods are likely to shape the future of furniture design and production, offering new opportunities for designers and manufacturers to create innovative products for consumers.

In the final analysis, it is observed that this system is an important system that ensures the regular and systematic production of furniture by the expectations of the manufacturer and the user. In this regard, it is evaluated that it will be beneficial for both sectoral users and researchers. It is very important to address and evaluate these and similar issues that are open to development.

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Author Contribution and Conflict of Interest Declaration Information

1st author % 40, 2nd author % 60 contributed. There is no conflict of interest.

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